SECTIONS

1-7

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SWEET'S CATALOG FILE

A File of Manufacturers' Catalogs designed for the use of Architects, Engineers, Contractors and others whose practice it is to select, specify or purchase building materials, equipment and allied services.

SWEET'S CATALOG SERVICE

DIVISION OF F. W. DODGE CORPORATION

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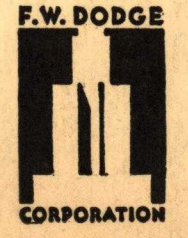

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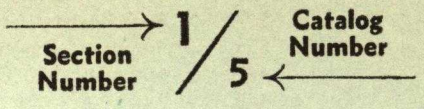
MANUFACTURERS INDEX

Manufacturers' catalogs are indexed by section and catalog numbers:



A

Accurate Metal Weather Strip Co. 16/61
Acker & Man, Inc. 16/12
Ackerman-Johnson Co. 16/43
Acme Asbestos Covering & Flooring Co., Inc. 11/43
Acme Bulletin & Directory Board Corp. 21/96
Acme Metal Products Corp. 28/2
Acme Steel Co. 11/94
Acorn Wire and Iron Works 20/32
Acoustipulp, Inc. 10/34
Adam, Frank, Electric Co. 23/12
Adams & Westlake Co. 15/1
Adensite Co., Inc. 5/1
Adjustable Louver Corp. 7/32
Æolus Dickinson Industrial Div. Paul Dickinson, Inc. 7/16
Aerocrete Corp. of America 3/30
Aeroshade Co. 16/93
Aetna Steel Products Corp. 14/1
Airolite Co. 16/76
Akins Sales Co., Inc. 21/95
Alberene Stone Corp. of Virginia 4/18
Alfol Insulation Co., Inc. 10/3
Allegheny Ludlum Steel Corp. 11/29
Allen Corp. 7/18
Allen, W. D., Mfg. Co. 21/34
Allith-Prouty Inc. 16/14
All-Metal Partition Co., Inc.
Office Partitions 20/1
Toilet Partitions 20/13
Allmetal Weatherstrip Co. 16/62
All-Steel-Equip Co., Inc. 21/1
Aluminum Co. of America
Extruded Shapes 13/13
Metal for Window Frames 15/2
Metals 13/1
Paints 17/1
Aluminum Cooking Utensil Co. 28/28
American Abrasive Metals Co.
Gratings 11/86
Safety Treads 12/5
American Air Filter Co., Inc. 26/53
American Asphalt Roof Corp. 6/11
American Automatic Electric Sales Co. 25/11
American Blower Corp., Div. of American Radiator & Standard Sanitary Corp. 26/2
American Blue Stone Co.
Building Stone 4/17
Treads, Flooring, etc. 12/6
American Brass Co.
Copper Heating Tubes 26/115
Copper Roofing 6/35
Extruded Shapes 13/14
Flashings 6/42
Metal for Tanks 27/52
Pipe 27/7
American Bronze Co. 13/16
American Cabinet Hardware Co. 16/40
American Chain & Cable Co., Inc., see American Chain Div. American Chain & Cable Co., Inc. 16/8
American Chain Div. American Chain & Cable Co., Inc. 16/8
American Chimney Corp. 26/127
American Crayon Co. 17/35
American Cyanamid & Chemical Corp.
Floor and Roof Construction 3/26
Gypsum Plaster 9/23
Partition Tile 4/43
American District Telegraph Co. 25/1
American Flange & Mfg. Co., Inc. 10/4
American Fleurisit Co., Inc., see Washington Concrete Corp. 11/15
American Foundry & Furnace Co. 26/71
American-Franklin-Olean Tiles, Inc. 11/1
American Gas Products Corp., Div. American Radiator & Standard Sanitary Corp. 26/1
American Iron & Steel Works, see Jones & Laughlin Steel Corp. 3/5; 12/3; 27/3
American Lumber & Treating Co. 8/1
American Machine & Metals, Inc.
See DeBothezat Ventilating Equipment Div. American Machine & Metals, Inc. 26/56
See Troy Laundry Machinery Div. of American Machine and Metals, Inc. 28/45
American Mason Safety Tread Co. 12/7
American Mast & Spar Corp. 13/35
American-Moninger Greenhouse Mfg. Corp. 21/73
American Plywood Corp. 14/50
American Radiator & Standard Sanitary Corp.
See American Blower Corp., Div. of American Radiator & Standard Sanitary Corp. 26/2
See American Gas Products Corp., Div. of American Radiator & Standard Sanitary Corp. 26/1
See Campbell Metal Window Corp., Div. of American Radiator & Standard Sanitary Corp. 15/5
See Church, C. F., Mfg. Co., Div. of American Radiator & Standard Sanitary Corp. 27/62
See Fox Furnace Co., Div. of American Radiator & Standard Sanitary Corp. 26/11
American Sanitary Partition Co. 20/14
American Sheet Metal Works 7/35
American Steel Furniture Co. 20/15
American Steel & Wire Co. 3/41
See also United States Steel Corp. Subsidiaries 13/7
American Telephone & Telegraph Co. and Associated Cos., see Bell Telephone System 25/12
American Terra Cotta Corp. 4/21
American Terrazzo Strip Co. 11/16
American 3 Way-Luxfer Prism Co.
Daylighting 7/1
Diffusing Glass 18/5
American Tile & Rubber Co. 11/54
American Window Glass Co. 18/1
American Zinc Institute Inc. 6/36
Anaconda Wire & Cable Co. 23/1

Anchor Post Fence Co. 21/82
Andersen Corp. 15/27
Anemostat Corp. of America 26/72
Angler Corp. 10/1
Ankortite Products, Inc. 3/50
Anthony Company 26/93
Anti-Hydro Waterproofing Co. 5/2
Appalachian Hardwood Mfrs. Inc. 8/8
Appalachian Marble Co., Inc. 4/7
Aquabar Waterproofing Products, Inc. 5/3
Arch Roof Construction Co., Inc. 3/16
Architectural Record, see Dodge, F. W., Corp. 1/4
Arex Co.
- Louvers 7/33
- Roof Ventilators 7/17

Arkansas Soft Pine Bureau 8/9
Arketex Ceramic Corp. 4/30
Ar-ke-tex Corp., see Arketex Ceramic Corp. 4/30
Armored Concrete Corp. 13/44
Armstrong Co. 18/13
Armstrong Cork Products Co.
- Acoustical Materials and Treatments 10/35
- Cork Insulation 10/43
- Flooring and Wall Coverings 11/63

Arnesto Paint Co., Inc. 17/2
Arrow-Hart & Hegeman Electric Co. 23/7
Art Metal Construction Co.
- Hollow Metal Doors 14/2
- Hospital Equipment 21/50
- Interior Equipment—Bank, Library, etc. 21/16; 21/17
- Kitchen Cabinets 28/1
- Partitions 20/2

Artstone Rocor Corp.
- Paint 17/3
- Stucco 9/25

Asher & Boretz, Inc. 21/30
Associations
- Appalachian Hardwood Mfrs. Inc. 8/8
- Arkansas Soft Pine Bureau 8/9
- Bankers Electric Protective Assn. 21/40
- California Redwood Assn. 8/10
- Cast Stone Institute 4/20
- Cut Stone Assn. of Indiana 4/11
- Douglas Fir Plywood Assn. 3/38; 8/18
- Finishing Lime Assn. of Ohio 9/18
- Glazed Brick & Tile Institute 4/33
- Granite Assn. 4/4
- Maple Flooring Mfrs. Assn. 11/77
- National Door Mfrs. Assn. Inc. 15/32
- National Oak Flooring Mfrs. Assn. 11/78
- National Terrazzo & Mosaic Assn. 11/21
- Page Fence Assn. 21/85
- Portland Cement Assn. 4/44
- Red Cedar Shingle Bureau 6/55
- Southern Hardwood Producers, Inc. 8/15
- Tile Mfrs. Assn. 11/9
- Western Pine Assn. 8/17

Astrup Co. 16/101
Atchison Revolving Door Co. 14/46
Aten Sewage Disposal Co., Inc. 27/17
Athey Co.
- Cloth Lined Weatherstrips 16/63
- Window Shades 16/92

Atlantic Steel Co.
- Foundation Ventilators 7/34
- Hand Rails 13/15

Atlantic Terra Cotta Co. 4/22
Atlantis Steel Products Corp.
- Bank and Office Partitions 20/3
- Toilet Partitions 20/16

Atlas Mineral Products Co. of Pennsylvania 4/54
Atlas Supply Co. 10/21
Auburn Foundry, Inc. 26/104
Auer Register Co. 26/73
Automatic Devices Co. 21/53
Automatic Nut Co., Inc. 3/52

B

B & T Floor Co. 11/37
Babcock-Davis Corp.
- Bleachers 21/63
- Drives 14/29
- Flag Poles 13/36
- Hatchways and Scuttles 7/19
- Lightproof Shades 16/94

Badger Wire & Iron Works, Inc. 13/17
Baker Ice Machine Co., Inc. 26/29
Bankers Electric Protective Assn. 21/40
Barber Asphalt Co., Inc. 6/1
Barber-Colman Co.
- Garage Doors and Operators 14/39
- Grilles and Registers 26/75
- Heat Controllers and Regulators 26/33

Barland Weatherstrip Material Co. 16/64
Barley-Earheart Corp., see Wasco Flashing Co. 6/48
Barnes & Jones Inc. 26/34
Barnett Canvas Goods & Bag Co., Inc. 6/20
Bar-Ray Products, Inc. 10/53
Barrell, Wiliam L., Co., Inc. 6/21
Barrett Co.
- Rock Wool Insulation 10/8
- Roof Drains 27/19
- Roofing & Waterproofing 6/2

Bayley, William, Co. 15/4
Bead Chain Mfg. Co. 16/9
Beaton & Cadwell Mfg. Co. 26/90
Beaton & Corbin Mfg. Co. 26/91
Beckley-Cardy Co. 21/18
Beckman-Dawson Roofing Co., see Flintkote Co. 6/13
Beckwith Elevator Co., Inc.
- Ash Hoist, Lifts and Sidewalk Elevators 26/121
- Dumbwaiters and Elevators 22/1

Belden Brick Co. 4/28
Belden-Stark Brick Co., see Stark Brick Co. 4/36
Bell Telephone System 25/12
Benjamin Electric Mfg. Co. 24/11
Bennett Fireplace Co. 26/132
Berger Brothers Co. 6/37
Berger Mfg. Div. Republic Steel Corp.
- Interior Lighting 24/2
- Lockers 21/2
- Metal Lath 9/1

Bergmann, H. H. W., & Co. 7/36
Berry Brothers, Inc. 17/4
Bessler Disappearing Stairway Co. 12/1
Best Register Co. 26/74
Bethlehem Steel Co.
- Concrete Reinforcing 3/42
- Fabricated Steel Construction 3/3
- Joists, Trusses, etc. 3/4
- Structural Shapes 3/2

Better Bilt Door Co. 14/38
Bilco Mfg. Co. 13/42
Billings-Chapin Co. 5/8a

Bird & Son, inc.
Built-up Roofing ... 6/3
Flooring ... 11/64
Shingles ... 6/12
Bishop & Babcock Mfg. Co., see Massachusetts Blower Div. of Bishop & Babcock Mfg. Co. ... 26/55
Blabon, George E., Co., see Sloane-Blabon Corp. ... 11/67
Blake Specialty Co. ... 27/20
Blank, Frederic, & Co., Inc. ... 11/68
Blaw-Knox Co. ... 11/87
Blaw-Knox Sprinkler Div. ... 21/31
Bliss Steel Products Corp. ... 15/3
Blue Ridge Glass Corp. ... 18/3
Bobrick Mfg. Corp. ... 27/103
Bohn Aluminum & Brass Corp. ... 13/2
Bommer Spring Hinge Co. ... 16/21
Boosey, Norman, Mfg. Co. ... 27/21
Boro Wood Products Co. ... 28/3
Boston Lightning Rod Co. ... 23/17
Boston Varnish Co. ... 17/5
Bostwick-Goodell Co. ... 16/80
Bostwick Steel Lath Co. ... 9/2
Bradley Washfountain Co. ... 27/81
Brasco Mfg. Co. ... 19/1
Breeze Corp., Inc. ... 21/19
Briar Hill Stone Co. ... 4/14
Bridgeport Brass Co. ... 27/8
Bright, H. V., Turn Stile Co. ... 21/60
Bright Light Reflector Co., Inc. ... 24/12
Brisk Waterproofing Co. ... 5/4
Brown Instrument Co., see Minneapolis-Honeywell Regulator Co. ... 26/41
Brownell Co. ... 26/94
Bruce, E. L., Co. ... 11/72
Bruner, P. M., Granitoid Co. ... 7/14
Brunswick-Balke-Collender Co.
Closet Seats ... 27/61
Shower Receptors ... 27/75
Bryant Electric Co. ... 23/8
Bryant Heater Co. ... 26/3
Buckingham-Virginia Slate Corp. ... 6/22
Buffalo Forge Co. ... 26/54
Builders' Cushion Joint Co. ... 4/27
Bull Dog Floor Clip Co. ... 3/49
Burkett Lightning Rod Co. ... 23/18
Burlington Venetian Blind Co. ... 16/81
Burnham Boiler Corp. ... 26/4
Burrowes Corp. ... 16/47
Burt Mfg. Co. ... 7/20
Byers, A. M., Co. ... 27/1
Byrne Doors, Inc. ... 14/24

C

Cabot, Samuel, Inc.
Insulation ... 10/9
Shingles ... 6/50
Stains and Preservatives ... 17/6
Waterproofing Paints ... 5/5
Calbar Paint & Varnish Co. ... 5/6
Caldwell Mfg. Co. ... 16/1
Caldwell, W. E., Co., Inc. ... 27/55
California Redwood Assn. ... 8/10
California Stucco Products Co. ... 10/36
Campbell Metal Window Corp. Div. of American Radiator & Standard Sanitary Corp. ... 15/5
Canton Drop Forging Co. ... 16/18
Canton Foundry & Machine Co. Div. of The Hill Clutch Machine & Foundry Co. ... 13/43
Capehart, Inc. ... 25/13
Capital Elevator & Mfg. Co.
Ash Hoists ... 26/122
Elevators ond Dumbwaiters ... 22/2
Capitol Bronze Corp. ... 19/2
Capitol Mail Chute Corp. ... 21/94a
Carbide and Carbon Chemicals Corp., see Pyrofax Div., Carbide and Carbon Chemicals Corp. ... 28/67
Carbolineum Wood Preserving Co., Inc. ... 8/3
Carey, Philip, Co.
Built-up Roofing ... 6/4
Pipe Coverings ... 10/48
Rock Wool ... 10/10
Shingles ... 6/14
See also Miami Cabinet Div., Philip Carey Co. ... 27/98
Carlson Building Specialties ... 3/1
Carlson Forgings Co., see Carlson Building Specialties ... 3/1
Carlyle Tile Co. ... 11/5
Carnegie-Illinois Steel Corp., see United States Steel Corp. Subsidiaries ... 13/7
Carney Co. ... 4/45
Carrier Corp. ... 26/5
Carthage Marble Co. ... 4/8
Cartier, M. N., & Sons Co. ... 6/30
Case, W. A., & Son Mfg. Co. ... 27/57
Casement Hardware Co. ... 16/31
Cast Stone Institute ... 4/20
Ceco Steel Products Co. ... 15/6
Celcure Southern Corp. ... 8/2
Celotex Corp.
Acoustical Insulation ... 10/37
Built-up Roofing ... 6/5
Insulation ... 10/22
Cemline Corp. ... 27/53
Central Alloy Steel Div. Republic Steel Corp., see Republic Steel Corp. ... 13/5
Central Commercial Co. ... 11/18
Central Wire and Iron Works ... 12/2
Century Brass Works, Inc. ... 27/82
Century Fan & Ventilator Co. ... 7/21
Century Lighting, Inc. ... 24/13
Ceresit Waterproofing Corp. ... 5/7
Certain-teed Products Corp.
Acoustical Materials ... 10/23
Built-up Roofing ... 6/6
Gypsum Lath, Plaster and Wallboard ... 9/3
Chamberlin Metal Weather Strip Co., Inc.
Screens ... 16/48
Weatherstrips ... 16/65
Chase Brass & Copper Co., Inc.
Copper Tube and Fittings ... 27/9
Extruded Shapes ... 13/3
Flashings ... 6/44
Roofing Materials ... 6/38
Screen Cloth ... 16/49
Chelsea Elevator Co. ... 22/3
Cheney Co. ... 6/43
Chicago Dryer Co. ... 28/43
Chicago Hardware Foundry Co. ... 27/112
Chicago Spring Hinge Co. ... 16/22
Church, C. F., Mfg. Co., Div. of American Radiator & Standard Sanitary Corp. ... 27/62
Cincinnati Fly Screen Co. ... 16/50
Cincinnati Iron Fence Co., Inc. ... 21/83
Clancy, J. R., Inc. ... 21/54
Clarage Fan Co. ... 26/6
Clark, R. W., Mfg. Co. ... 21/97
Clay Equipment Corp. ... 21/88
Clay Products Co., Inc., see Arketex Ceramic Corp. ... 4/30
Claycraft Co. ... 4/31
Cleveland Lock Works ... 16/7

Clinton Metallic Paint Co. 4/53
Coburn Trolley Track Co. 16/15
Cohoes Rolling Mill Co. 27/2
Cold Spring Granite Co., Inc. 4/1
Coleman Lamp & Stove Co. 26/7
Colonial Fireplace Co. 26/134
Colonial Lumber Specialties, Inc. 6/52
Columbia Metal Box Co. 27/90
Columbia Mills, Inc. 16/82
Columbia Radiator Co. 26/95
Columbia Steel Co., see United States Steel Corp. Subsidiaries 13/7
Columbian Lock Div., see Cleveland Lock Works 16/7
Columbus Coated Fabrics Corp.
  Shade Cloth 16/95
  Wall Coverings 11/69
Combo Corp. 28/52
Combustioneer, Div. Steel Products Engineering Co. 26/105
Compound Injector & Specialty Co. 27/22
Compound and Pyrono Door Co. 14/51
Concrete Engineering Co., Inc., see Ceco Steel Products Co. 15/6
Concrete Plank Co., Inc. 3/31
Concrete Steel Co. 3/43
Condensation Engineering Corp. 26/131
Congoleum-Nairn Inc. 11/65
Conkling Armstrong Terra Cotta Co. 4/23
Consolidated Expanded Metal Cos.
  Concrete Reinforcement 3/44
  Metal Lath and Accessories 9/4
  Open Mesh Partitions 20/33
  Partition Systems 9/17
  Vault Reinforcement 21/36
Consolidated Iron-Steel Mfg. Co., see Duplex Incinerator Div. of the Consolidated Iron-Steel Mfg. Co. 28/53
Construction Castings Corp., see Armored Concrete Corp. 13/44
Continental Car-Na-Var Corp. 17/36
Continental Clay Products Co. 4/32
Cooling and Air Conditioning Div. of B. F. Sturtevant Co., see Sturtevant, B. F., Co. 26/58
Copper Range Co., see Hussey, C. G., & Co. 13/4
Cork Import Corp. 10/44
Cork Insulation Co., Inc. 10/45
Cornell Iron Works, Inc. 14/31
Corning Glass Works 24/3
Corry Metal Corp. 16/51
Cotta Transmission Co., see Econ-O-Col Stoker Div. Cotta Transmission Co. 26/107
Covert, H. W., Co.
  Drains 27/23
  Fireplace Specialties 26/133
Crampton-Farley Mfg. Co. 27/24
Crane Co. 27/56
Creo-Dipt Co., Inc. 6/51
Crex Patent Column Co. 3/8
Crittall Double Hung Window Co., see Sterling Windows, Inc. 15/21
Crittall-Federal, Inc. 15/7
Croessant Machine Works 16/44
Croft Steel Windows, Inc. 15/8
Cromar Co. 11/73
Crooks, W. D., & Sons 14/52
Cuprinol Inc. 8/4
Curtis Companies Service Bureau
  Doors and Millwork 14/53
  Kitchen Units 28/4
  Wood Sash 15/28
Curtis Lighting, Inc. 24/4
Curtis Mfg. Co., see Curtis Refrigerating Machine Co., Div. Curtis Mfg. Co. 26/30
Curtis Refrigerating Machine Co. Div. Curtis Mfg. Co. 26/30
Custodis, Alphons, Chimney Construction Co. 26/128
Cut Stone Assn. of Indiana 4/11
Cutler Mail Chute Co. 21/94
Cyclone Fence Co. 21/84

D

D-B Stud & Spreader Co., see Mogul Corp. 3/51
Dahlstrom Metallic Door Co.
  Doors 14/3; 14/4
  Electrical Conduit 23/3
  Partitions 20/4
Davidson Enamel Products, Inc. 13/8
Day-Brite Lighting Inc. 24/14
Dayton Pump & Mfg. Co. 27/29
Deagan, J. C., Inc. 21/56
DeBothezat Ventilating Equipment Div. American Machine & Metals, Inc. 26/56
Decatur Iron & Steel Co.
  Jail Construction 21/42
  Ornamental Metal 13/18
Delco-Frigidaire Conditioning Division, General Motors Corp. 26/9
Del Turco Bros., Inc. 12/8
Deming Co. 27/30
Dennis, W. J., & Co. 16/66
Detroit Lubricator Co. 26/35
Detroit Show Case Co. 19/3
Detroit Steel Products Co.
  Roof Decks 3/21
  Windows 15/9
Detroit Stoker Co. 26/106
Devoe & Raynolds Co., Inc. 17/7
Diamond Mfg. Co. 26/76
Dickinson, Paul, Inc., see Æolus Dickinson Industrial Div. Paul Dickinson, Inc. 7/16
Diebold Safe & Lock Co. 21/37
  See also United Metal Products Div. Diebold Safe & Lock Co. 14/22
Dieterich Steel Cabinet Corp. 28/5
Dixon, Joseph, Crucible Co. 17/8
Dodge, F. W., Corp. 1/4
Dodge Reports, see Dodge, F. W., Corp. 1/4
Dodge Statistical Research Service, see Dodge, F. W., Corp. 1/4
Dolge, C. B., Co. 17/37
Domestic Hill Laundry Equipment Co., Inc. 28/43
Donley Brothers Co. 26/135
Doran Co. 27/76
Douglas Fir Plywood Assn.
  Forms 3/38
  Plywood 8/18
Doyle, John M. 13/19
Dravo Corp. 11/88
Driwood Corp.
  Mouldings 8/11
  Partitions 20/5
Drouvé, G., Co. 7/3
Dubois Fence & Garden Co., Inc. 21/78
Dubois Reeves Fences, Inc., see Dubois Fence & Garden Co., Inc. 21/78
Dunham, C. A., Co. 26/36
Duplex Hanger Co. 3/53
Duplex Inc. 16/2
Duplex Incinerator Div. of the Consolidated Iron-Steel Mfg. Co. 28/53
du Pont de Nemours, E. I., & Co., Inc.
  Paints 17/9
  Shade Cloth 16/96

Durabilt Steel Locker Co. 21/3
Duraflex Corp. 11/47
Duriron Co., Inc. 27/13
Duro Co. 27/46
Durr, A., & Co. 4/40
Dusing & Hunt, Inc. 14/5

E

Eagle-Picher Sales Co.
  Insulation 10/11
  Paint Pigments 17/10
Eastern Terra Cotta Co. 4/24
Ebco Mfg. Co.
  Drinking Fountains 27/83
  Sinks 28/22
  Toilet Partitions 20/17
Econ-O-Col Stoker Div. Cotta Transmission Co. 26/107
Economy Pumps, Inc. 27/31
Edison General Electric Appliance Co., Inc.
  Stoves and Ranges 28/21
  Water Heaters 27/39
Edwards and Co., Inc. 25/2
Edwards Mfg. Co. 6/26
Ehret Magnesia Mfg. Co. 10/49
Elaterite Paint & Mfg. Co. 5/8
Electrol Incorporated 26/8
Elevator Supplies Co., Inc. 22/16
Elgin Stove & Oven Co. 28/6
Elhide Co.
  Fencing 21/79
  Shingles 6/53
Elian, Frank, & Co. 26/123
Elkay Mfg. Co. 28/23
Elkhart Brass Mfg. Co. 21/35
Ellison Bronze Co., Inc. 14/6
Ellison Louvre Co., Inc. 16/77
Emerson Electric Mfg. Co. 26/61
Empire Varnish Co. 17/11
Enamel Products Co. 13/10
Energy Elevator Co. 22/4
Equal-Aire Incinerator Div. Sargent Building Specialties Co. 28/54
Erie Enameling Co. 13/9
Erikson Electric Co. 24/15
Ernst, Charles K., Inc. 26/124
Evans Products Co., see National Wood Products Div. Evans Products Co. 11/79
Evans, W. L., Co. 21/4
Evanston Soundproof Door Co., see Irving Hamlin 10/41
Everhard Mfg. Co. 16/52
Everseal Mfg. Co., Inc. 17/12
Everson Mfg. Co. 21/69
Ewing Incinerator Co. 28/55
Excel Metal Cabinet Co., Inc. 28/7

F

Fairbanks, Morse & Co. 26/108
Fairfacts Co., Inc. 27/92
Fairhurst, John T.
  Partitions 20/23
  Wardrobes 21/5
Fanner Mfg. Co. 16/102
Faries Mfg. Co. 27/91
Farley & Loetscher Mfg. Co.
  Kitchen Units 28/8
  Windows 15/29
  Wood Doors 14/54
Farrar & Trefts Inc. 26/96
Fedders Mfg. Co. 26/24
Federal-American Cement Tile Co. 3/32
Federal Seaboard Terra Cotta Corp. 4/25
Ferro-Co Corp. 26/87
Fiat Metal Mfg. Co.
  Shower Compartments 27/66
  Toilet Partitions 20/17a
Filtrine Mfg. Co. 27/47
Finishing Lime Assn. of Ohio 9/18
Finnell System, Inc. 17/38
Fir-Tex Insulating Board Co. 10/24
Fiske, J. W., Iron Works 13/20
Fitzgibbons Boiler Co., Inc. 26/10
Fletcher, H. E., Co. 4/2
Flintkote Co.
  Asphalt Shingles 6/13
  Fiber Board 10/25
  House Insulation 10/12
Flockhart Foundry Co., see Armored Concrete Corp. 13/44
Floor Accessories Co., Inc., see Ankortite Products, Inc. 3/50
Flour City Ornamental Iron Co. 15/11
Flush-Metal Partition Corp.
  Shower Stalls 27/65
  Toilet Partitions 20/18
Flynn, Michael, Mfg. Co. 15/10
Folding Products Corp., see Richmond Fireproof Door Co. 20/26
Forman Co. 13/21
Formica Insulation Co. 11/30
Foster, Guy C., Inc. 21/77
Fourco Glass Co. 18/2
Fox Furnace Co., Div. of American Radiator & Standard Sanitary Corp. 26/11
Franklin Tile Co., see American-Franklin-Olean Tiles, Inc. 11/1
Frantz Mfg. Co. 16/17
Frederick Iron & Steel Co. 26/109
Frick Co. 26/31
Friedrich, E. H., Co. 14/7
Fries and Son Steel Construction and Engineering Co. 21/43
Fulton Sylphon Co. 26/37

G

Gail, G. W., Inc. 16/67
Galloway Terra Cotta Co. 4/26
Garcy Reflectors Div. of Garden City Plating & Mfg. Co. 24/17
Garden City Plating & Mfg. Co. 16/41
  See also Garcy Reflectors Div. of Garden City Plating & Mfg. Co. 24/17
Gaylord Bros., Inc. 21/22
General Alloys Co. 13/22
General Asphalt Co., see Barber Asphalt Co., Inc. 6/1
General Bronze Corp.
  Ornamental Metal Work 13/23
  Revolving Doors 14/47
  Windows 15/13
General Controls Co. 26/38
General Electric Co.
  Motors, Generators, Switchboards, etc. 23/13
  Refrigerators, Sinks and Kitchen Units 28/9
  Wiring Devices and Cables 23/9
  See also Edison General Electric Appliance Co., Inc. 28/21
  See also Trumbull Electric Mfg. Co. 23/15
  See also Warren Telechron Co. 25/10

General Electric Vapor Lamp Co., see General Electric Co. 23/13
General Electric X-Ray Corp., see General Electric Co. 23/13
General Insulation & Mfg. Co. 10/13
General Motors Corp., see Delco-Frigidaire Conditioning Division, General Motors Corp. 26/9
General Sheet Metal Works, Inc. 7/4
General Time Instruments Corp., see Seth Thomas Clocks Division of General Time Instruments Corp. 25/7
Gerity-Adrian Mfg. Corp. 27/93
Germain Mfg. Co. 16/84
Gerstein & Cooper Co. 27/40
Getty, H. S., & Co., Inc. 16/33
Gibson & Kirk Co. 16/38
Gilbert & Barker Mfg. Co. 26/13
Gillis & Geoghegan, Inc. 26/125
Glazed Brick & Tile Institute 4/33
Gleason-Tiebout Glass Co. 24/5
Glidden Co. 17/14
Goder, Joseph, Incinerators 28/56
Goldsmith Metal Lath Co. 9/5
Goodrich Electric Co. 24/16
Goodyear Tire & Rubber Co., Inc. 11/55
Goss, John L., Corp. 4/3
Governale Bros., Inc. 26/67
Gow Co., see Raymond Concrete Pile Co., Inc. 2/2
Grand Rapids Hardware Co. 16/3
Granidur Products Co. 4/19
Granite Assn. 4/4
Grant Elevator Equipment Corp. 22/17
Grant Pulley and Hardware Co. 16/30
Grinnell Co., Inc.
- Heating Specialties 26/46
- Pipe Hangers 26/114
- Prefabricated Piping Materials 26/116
- Sprinkler Systems 21/33
- Unit Heaters and Coolers 26/25
- Welding Fittings 26/117

Guastavino, R., Co. 10/40
Gullborg, John S., Mfg. Co. 16/32
Guth, Edwin F., Co. 24/6

H

H. L. G. Co. 27/48
Hachmeister-Inc. 11/49
Hallenscheid & McDonald 27/94
Hamilton Mfg. Co. 21/20
Hamlin, Irving 10/41
Hamm, S. H., & Son 21/8
Hammond Instrument Co. 21/59
Hansell-Elcock Co. 13/37
Harbor Plywood Corp. 8/19
Hardwood Products Corp.
- Sound-Insulating Doors 10/42
- Veneered Doors 14/55

Harrington & King Perforating Co. 26/77
Harris Mfg. Co. 11/74
Harrison-Weise Co. 16/13
Hart & Cooley Mfg. Co. 26/78
Hart Mfg. Co. 23/14
Hartmann-Sanders Co. 8/24
Hartshorn, Stewart, Co. 16/97
Haskelite Mfg. Corp. 11/75
Haslett Chute and Conveyor Co.
- Fire Escapes 12/15
- Laundry and Waste Chutes 28/46

Hastings & Co. 17/13
Hastings Pavement Co. 11/83
Hauserman, E. F., Co. 20/7
Hausman Steel Co. 3/39
Hazard Insulated Wire Works, Div. of Okonite Co. 23/2
Healy-Ruff Co. 26/92
Heatilator Co. 26/136
Heil Co. 26/12
Henderson Bros. 18/9
Hendrick Mfg. Co.
- Gratings and Grids 11/89
- Grilles and Screens 26/79

Herrmann & Grace Co. 15/12
Herron-Zimmers Moulding Co. 11/38
Hershey Machine & Foundry Co., see Motorstokor Div. Hershey Machine & Foundry Co. 26/113
Hess Warming & Ventilating Co. 27/95
Hetson-Sommers Co., Inc. 5/9
Hetzel Roofing Products Co. 6/49
Higgin Products, Inc.
- Access Panels 27/87
- Lightproof Shades 16/98
- Screens 16/53
- Venetian Blinds 16/83
- Weatherstrips 16/68

Hill, C. V., & Co., Inc. 28/32
Hill Clutch Machine & Foundry Co., see Canton Foundry & Machine Co. Div. of The Hill Clutch Machine & Foundry Co. 13/43
Hillyard Sales Co. 17/39
Himmel Brothers Co.
- Shower Doors and Shields 27/67
- Snap-on Mouldings 11/39
- Store Fronts 19/4

Hirschman, W. F., Co., Inc. 7/22
Hitchings & Co. 21/74
Hobart Mfg. Co. 28/30
Hockaday, Inc. 17/16
Hoegger, Inc. 27/96
Hoffman, Andrew
- Blackboard Display Rails 21/9
- Window Hardware 16/34

Hoffman Specialty Co., Inc. 26/47
Holland Furnace Co. 26/14
Holmes Products Co. 21/27
Holophane Co., Inc. 24/18
Holt Hardwood Co. 11/76
Homasote Co. 10/26
Home Owners Catalogs, see Dodge, F. W., Corp. 1/4
Hood, B. Mifflin, Co.
- Floor Tile 11/2
- Roofing Tile 6/28

Hood Rubber Co., Inc. 11/56
Hope's Windows Inc. 15/14
Horn, A. C., Co. 5/10
Horn Folding Partition Co.
- Bleachers 21/64
- Folding Partitions 20/24

Houston Metal Products Div. of Vent-O-Lite Co. 28/64
Howie Co.
- Doors 14/8
- Skylights 7/5

Hubbell, Harvey, Inc. 23/10
Huck-Gerhardt Co., Inc. 14/45
Hunt, Robert W., Co. 1/1
Huntington Laboratories, Inc. 17/40
Hussey, C. G., & Co. 13/4
Hydraulic-Press Brick Co. 4/34
Hydrolithic Waterproofing Co., Inc. 5/11
Hy-Test Cement Co. 4/46

I

Ideal Hanger Co. 3/54
Ideal Ventilator Co. 16/75
Ilg Electric Ventilating Co. 26/60
Illinois Bronze & Iron Works 19/5
Imperial Brass Mfg. Co.
  Flush Valves 27/58
  Soap Dispensers 27/104
  Sump Pumps 27/32
  Traps 27/25
Improved Office Partition Co., see Driwood Corp. 8/11; 20/5
Inclinator Co. of America 22/5
Independent Register Co. 26/80
Indiana Foundry Co. 26/137
Indiana Limestone Corp. 4/12
Indianapolis Terra Cotta Co., Inc., see American Terra Cotta Corp. 4/21
Ingersoll-Rand Co. 26/32
Ingram-Richardson Mfg. Co. of Indiana, Inc. 28/24
Inland Steel Co. 11/85
Insulite Co. 10/27
International Boiler Works Co. 26/97
International Business Machines Corp., International Time Recording Div. 25/3
International Casement Co., Inc., see Hope's Windows Inc. 15/14
International Revolving Door Co. 14/48
International Time Recording Div., see International Business Machines Corp., International Time Recording Div. 25/3
Interstate Shade Cloth Co. 16/85
Iron Fireman Mfg. Co. 26/110
Irving Iron Works Co., see Irving Subway Grating Co., Inc. 11/90
Irving Subway Grating Co., Inc. 11/90
Ives, H. B., Co. 16/35

J

Jackson, Wm. H., Co. 26/138
James Lumber Co. 6/54
Jamestown Metal Corp. 14/10
Jamestown Metal Desk Co., see Jamestown Metal Corp. 14/10
Jamestown Screen & Mfg. Co., see Norquist Products, Inc. 16/56
Jamison Cold Storage Door Co. 28/33
Janes & Kirtland, Inc. 28/10
Jenkins Bros. 27/15
Jennison-Wright Co. 11/81
Jewel Electric & Mfg. Co. 21/21
Jiffy Mfg. Co., see Leonard, P. C., Co. 10/17
Johns-Manville
  Acoustical Treatments 10/38
  Asbestos Wainscoting and Flexible Wall Board 11/31
  Asphalt Tile Flooring 11/48
  Concrete Reinforcement 3/45
  Corrugated Asbestos 6/32
  Flush Doors 14/56
  Insulating Board 10/28
  Partitions and Walls 20/6
  Pipe Insulation 10/50
  Plaster Lath 9/7
  Rock Wool Insulation 10/14
  Roofing 6/7
  Shingles 6/15
Johnson, Geo. W., Mfg. Co. 14/32
Johnson Metal Products Co. 16/54
Johnson, S. C., & Son, Inc. 17/41
Johnson Service Co. 26/39
Jones, Harold K., Co. 23/19
Jones & Laughlin Steel Corp.
  Channels for Stair Stringers 12/3
  Junior Beams 3/5
  Pipe 27/3
Josam Mfg. Co. 27/26
Just Mfg. Co. 28/25

K

Kalman Floor Co., Inc. 11/12
Kane Mfg. Corp. 16/55
Kason Hardware Corp.
  Refrigerator Hardware 28/40
  Showcase Hardware 16/42a
Kaustine Co., Inc.
  Furnaces 26/15
  Sewage Disposal Systems 27/16
Kawneer Co.
  Escalator Balustrades 22/14
  Store Front Construction 19/6
  Windows and Doors 15/15
Keasbey & Mattison Co.
  Building Insulation 10/16
  Pipe Insulation 10/51
  Roofing and Siding 6/33
  Shingles 6/16
  Siding 6/33a
  Wall Tile 11/32
Kelley Island Lime & Transport Co. 9/19
Kellogg, M. W., Co. 26/129
Kellogg Mann Corp. 28/57
Kennecott Copper Corp., see Chase Brass & Copper Co. Inc. 6/38; 6/44; 13/3; 16/49; 27/9
Kennedy, David E., Inc.
  Acoustical Materials 10/39
  Resilient Flooring 11/50
Kentucky Metal Products Co., Inc. 20/34
Kerlow Steel Flooring Co. 11/91
Kernchen Co., see Arex Co. 7/17
Kerner Incinerator Co. 28/58
Ketcham, G. M., Mfg. Corp. 27/68
Kewanee Boiler Corp. 26/98
Kewaunee Mfg. Co. 21/51
Keystone Shower Door Co. 27/69
Keystone Varnish Co. 17/15
Kiesling, John W., & Sons, Inc. 22/6
Kimberly-Clark Corp. 10/15
King, E. & F., Co., Inc. 17/17
Kinnear Mfg. Co.
  Overhead Type Doors 16/16
  Rolling Doors 14/33
Kiromac Mfg. Co. 14/11
Kitchen Maid Corp. 28/11
Kleistone Rubber Co., Inc. 11/57
Klemp, William F., Co., Inc. 11/92
Kliegl Bros. 24/7
Kloes, F. J., Inc. 16/103
Knape & Vogt Mfg. Co. 16/42
Knapp Bros. Mfg. Co. 9/6
Knight, Maurice A. 27/14
Knowles Mushroom Ventilator Co. 26/57
Koch Refrigerators, Div. of Koch Butchers Supply Co. 28/36
Kokomo Sanitary Pottery Corp. 27/60
Kompolite Co., Inc. 11/44
Kopp Glass, Inc. 24/8

Koppers Co. 6/8
See also Wood Preserving Corp. 8/7
Kosmos Portland Cement Co., Inc. 4/47
Kraftile Co. 11/3
Kuhls, H. B. Fred
Glazing Compounds 18/16
Waterproofing Compositions 5/12

L

L. C. N. Co., see Norton Lasier Co. 16/26
Lally Column Co. 3/9
Lamella Roof Syndicate, Inc. 3/18
Lamson Co. 21/99
Landolt's, Henry J., Sons, see Penn Brass & Bronze Works. 13/30
Lastik Products Co., Inc. 5/14
Lathrop-Hoge Gypsum Construction Co. 3/27
Lawson, F. H., Co. 27/97
Ledkote Products Co. 6/39
Lehman Sprayshield Co. 27/70
Lennox Furnace Co., Inc. 26/16
Leonard, P. C., Co. 10/17
Leonard Valve Co. 27/77
Levow, David 6/31
Lewis Asphalt Engineering Corp. 5/13
Lewis, Fred H., Co. 27/71
Libbey-Owens-Ford Glass Co.
Glass 18/3
Masonry Unit 4/37
Store Front 19/7
Structural Glass 11/27
Lingo, John E., & Son, Inc. 13/38
Link-Belt Co. 26/111
Lith-I-Bar Co. 3/10
Locher & Co., Inc. 4/29
Locke Insulator Corp., see General Electric Co. 23/13
Lockstrip Mfg. Corp. 11/17
Logan Co.
Ornamental Iron and Wire Work 13/24
Spiral Slide Fire Escapes 12/16
Long Fir Gutter Co. 6/56
Lord & Burnham Co. 21/74
Louden Machinery Co. 21/89
Louisville Cement Co., Inc. 4/48
Lucke, William B., Inc. 27/86
Ludowici-Celadon Co. 6/27
Lundell-Eckberg Mfg. Co., Inc. 15/16
Lupton's, David, Sons Co., see Flynn, Michael, Mfg. Co. ..15/10
Lutton, Wm. H., Co., Inc. 21/75
Lynch, Kenneth, Inc. 13/25
Lyon, Conklin & Co., Inc. 6/40
Lyon Metal Products, Inc. 21/6

M

MacArthur Concrete Pile Corp. 2/1
MacDonald Hardware Mfg. Co. 16/28
Machinery Builders, Inc. 21/55
Macomber, Inc. 3/6
Mahogany Association, Inc. 8/12
Mahon, R. C., Co.
Metal Covered Doors 14/12
Rolling Doors 14/34
Roof Decks 3/23
Roof Drains 27/27
Majestic Co.
Fireplace Accessories and Supplies 26/139
Milk Bottle and Package Receivers 28/59
Majestic Flashing Co. 6/45
Manhattan Terrazzo Brass Strip Co., Inc. 11/19
Manly Jail Works 21/44
Maple Flooring Mfrs. Assn. 11/77
Marbleloid, Inc. 11/45
Marcrome Art Marble Co. 12/9
Market Forge Co. 28/41
Marsh Electro Chlorination Co., Inc. 21/70
Marsh Wall Products Co. 11/33
Masonite Corp.
Fiber Board Insulation 10/29
Forms 3/40
Massachusetts Blower Div. of Bishop & Babcock Mfg. Co. 26/55
Master Builders Co. 5/15
Master Metal Strip Service 16/69
Masury, John W., & Son 17/18
Mathieson Alkali Works, Inc. 9/16
Matot, D. A.
Dumbwaiters and Elevators 22/7
Refrigerator Doors and Shelves 28/34
Matthews, Jas. H., & Co. 13/27
Maximent Co. 11/13
May Oil Burner Corp. 26/17
McCormick Longmeadow Stone Co., Inc. 4/15
McCray Refrigerator Co. 28/37
McDonnell & Miller 26/48
McGann, T. F., & Sons Co. 13/26
McIntire, F. N., Brass Works 21/41
McKee Door Co. 14/40
McKeown Bros. Co. 3/17
McKinney Mfg. Co. 16/19
McMillen, R., Co. 14/58
McShane Bell Foundry Co. 21/57
Medart, Fred, Mfg. Co.
Basket Ball Backstops 21/62
Wardrobe Lockers; Seating 21/7
Medusa Portland Cement Co. 4/49
Meierjohn-Metalcrafts-Wengler, Inc. 13/28
Meneely Bell Co. 21/58
Mercoid Corp. 26/40
Merit Shower Cabinet Corp. 27/73
Merkin, M. J., Paint Co., Inc. 17/19
Mesker Bros. Iron Co. 15/17
Metal Clad Doors, Inc. 14/13
Metal Office Furniture Co., see Receivador Div. Metal Office Furniture Co. 28/16
Metalace Corp. 26/81
Metalcrafts, see Meierjohn-Metalcrafts-Wengler, Inc. 13/28
Metallic Sash Operator Div. of William Bayley Co., see William Bayley Co. 15/4
Metropolitan Greenhouse Mfg. Corp. 21/76
Miami Cabinet Div., Philip Carey Co. 27/98
Micro-Westco, Inc. 27/33
Middleton Metal Products Co. 20/31
Midland Chemical Laboratories, Inc. 17/42
Midwest Concealed Bed Corp. 21/28
Milcor Steel Co.
Access Panels 27/88
Metal Lath 9/8
Roof Decks 3/24
Ventilators 7/23
Mills Co. 20/8
Milwaukee Stamping Co.
Hinges 16/23
Shower Compartments 27/72
Toilet Partitions 20/19

Milwaukee Valve Co. 26/49
Minneapolis-Honeywell Regulator Co. 26/41
Minwax Co.
Waterproofing 5/16
Wood Finishes and Masonry Coatings 17/43
Mississippi Glass Co. 18/6
Mitchell Mfg. Co. 21/23
Modern Steel Equipment Co. 28/12
Modine Mfg. Co. 26/68
Moeschl-Edwards Corrugating Co., Inc.
Metal Covered Doors 14/14
Rolling Doors 14/35
Mogul Corp. 3/51
Mohawk Asbestos Shingles, Inc. 6/17
Monarch Metal Weatherstrip Corp. 16/70
Monroe, Lederer & Taussig, Inc. 17/20
Moore, P. O., Inc. 21/91
Morse Boulger Destructor Co. 28/60
Morton Mfg. Co. 27/99
Mosaic Tile Co. 11/5
Mosler Safe Co. 21/38
Motorstokor Div. Hershey Machine & Foundry Co. 26/113
Moulding, Thos., Floor Mfg. Co. 11/52
Mueller Brass Co., see Streamline Pipe & Fittings Div. Mueller Brass Co. 27/12
Mueller, L. J., Furnace Co. 26/18
Muellermist Irrigation Co. 21/90
Mundet Cork Corp.
Bulletin Boards 21/10
Cork Flooring 11/62
Insulation 10/46
Muralo Co., Inc. 17/21
Murphy Door Bed Co.
Kitchen Cabinets 28/13
Wall Beds 21/29
Murray, D. J., Mfg. Co., see Unit Heater & Cooler Co. 26/27
Murray Tile Co., Inc.
Floor Tile 11/4
Roof Tile 6/29
Mutschler Bros. Co. 28/14
Myers, F. E., & Bro. Co. 27/34

N

N. S. W. Co. 15/30
Nailcrete Corp. 3/34
Nash Engineering Co. 26/50
National Chemical & Mfg. Co. 17/22
National Door Mfrs. Assn., Inc. 15/32
National Fireproofing Corp.
Face Tile 4/35
Structural Tile 4/42
National Gypsum Co.
Gypsum Floor and Roof Construction 3/28
Insulation 10/30
Lath and Accessories 9/9
National Lead Co. 17/23
National Lumber & Creosoting Co., see Wood Preserving Corp. 8/7
National Metal Products Co. 27/101
National Mortar & Supply Co. 9/20
See also Finishing Lime Association of Ohio 9/18
National Naylegrip Co., Inc. 3/33
National Oak Flooring Mfrs. Assn. 11/78
National Pipe Bending Co., Inc. 27/41
National Regulator Co., see Minneapolis-Honeywell Regulator Co. 26/41
National Steel Partition Co., Inc. 20/9
National Store Fronts 19/8
National Terrazzo & Mosaic Assn. 11/21
National Tile Co. 11/6
National Tube Co., see United States Steel Corp. Subsidiaries 13/7
National Wood Products Div. Evans Products Co. 11/79
Natural Slate Blackboard Co. 21/12
Nelson, A. R., Co., Inc., see Fairhurst, John T. 20/23; 21/5
Nesbitt, John J., Inc., see Webster, Warren, & Co. 26/44
Nessler Mfg. Co. 28/47
Never-Split Seat Co. 27/63
New Castle Products 20/25
New Jersey Fence Co. 21/80
New York Architectural Terra Cotta Co., see Eastern Terra Cotta Co. 4/24
New York Awning Co., Inc. 16/104
New York Machinery Co., Inc., see American Steel Furniture Co. 20/15
New York Silicate Book Slate Co., Inc. 21/13
Norquist Products, Inc. 16/56
North American Iron & Steel Co.
Doors 14/36
Ornamental Metal 13/29
North Bangor Slate Co. 6/23
North Carolina Granite Corp. 4/5
Norton Co. 11/20
Norton Door Closer Co., Div. of the Yale & Towne Mfg. Co. 16/27
Norton Lasier Co. 16/26

O

O'Brien Brothers Slate Co., Inc. 6/24
Ohio Hydrate & Supply Co. 9/21
Ohio Rubber Co. 12/10
Okonite Co., see Hazard Insulated Wire Works, Div. of Okonite Co. 23/2
Orange Screen Co. 16/57
Ornamental Iron Work Co. 12/4
Oswego Shade Cloth Co., See Hartshorn, Stewart, Co. 16/97
Otis Elevator Co. 22/8
Overhead Door Corp. 14/41
Overly Mfg. Co. 7/6
Owens-Illinois Glass Co.
Decorative Glass 18/11
Glass Brick or Block 4/38

P

Page Fence Assn. 21/85
Page & Hill Co. 8/13
Paine Co. 16/45
Paine Lumber Co., Ltd. 14/57
Palmer Products, Inc.
Soap Dispensers 27/105
Toilet Paper and Paper Towel Fixtures 27/109
Paraffine Cos., Inc. 11/66
Parker, Charles, Co. 27/100
Parker Rust-Proof Co. 1/3
Parsons Co. 28/15
Partrick & Wilkins Co. 25/4
Pass & Seymour, Inc. 23/11
Passonno-Hutcheon Co. 17/24
Patterson-Kelley Co., Inc. 27/42
Pauly Jail Building Co. 21/45
Payne, F. S., Co. 22/9

Payne-Spiers Studios, Inc. 18/10
Payne Studios, Inc., see Payne-Spiers Studios, Inc. 18/10
Peaslee-Gaulbert Paint & Varnish Co., Inc. 17/26
Pecora Paint Co., Inc. 18/14
Peelle Co. 14/25
Peerless Mfg. Corp., Inc. 26/142
Penberthy Injector Co.
  Heating Specialties 26/51
  Pumps 27/35
Penn Brass & Bronze Works 13/30
Penn Metal Co., Inc. 9/10
Penn Ventilating Co. 7/24
Pennsylvania Wire Glass Co.
  Plate Glass 18/7
  Skylights and Sidewall Construction 7/11
Penrod, Jurden & Clark Co. 8/14
Perey Turnstile Co. 21/61
Permutit Co. 27/49
Peterson and Neville, Inc.
  Door Frames 14/15
  Metal Trim 9/11
Phelps Dodge Copper Products Corp. 27/10
Philgas Dept., Phillips Petroleum Co. 28/66
Philipp Mfg. Co. 14/16
Phillips Petroleum Co., see Philgas Dept., Phillips Petroleum Co. 28/66
Phoenix Glass Co. 24/9
Phoenix Ventilator Co. 7/25
Pitt, William R., Composite Iron Works 20/35
Pittsburgh Corning Corp.
  Architectural Glass 18/12
  Glass Bricks or Blocks 4/39
  Structural Glass 11/28
  See also Pittsburgh Plate Glass Co. 18/4
Pittsburgh Incinerator Co. 28/61
Pittsburgh Plate Glass Co.
  Chalk Board 21/11
  Glass 18/4
  Paint 17/25
  Store Fronts 19/9
  See also Pittsburgh Corning Corp.
Pittsburgh Reflector Co. 24/19
Pittsburgh Testing Laboratory 1/2
Plastic Products Co. 18/15
Pole and Tube Works, Inc. 13/39
Pomeroy, S. H., Co., Inc. 15/18
Porcelain Metals, Inc. 13/11
Porcelain Products Co.
  Laundry and Waste Chutes 28/48
  Toilet Partitions 20/20
Porete Mfg. Co. 3/35
Porter, H. W., & Co., Inc. 26/119
Portland Cement Assn. 4/44
Potts Ash Hoist Corp. 26/126
Powers Regulator Co.
  Temperature Control Systems 26/42
  Water Controllers 27/78
Pratt & Lambert-Inc. 17/27
Pressed Prism Plate Glass Co. 18/8
Price Building Specialties, see Fairhurst, John T. . . . 20/23; 21/5
Procter & Gamble Co. 27/106
Protex Weatherstrip Mfg. Co. 16/71
Protexol Corp. 8/5
Pryne & Co., Inc. 26/62
Pullclean Towel Cabinet Co., Inc. 27/110
Pullman Mfg. Corp. 16/4
Puritan Rubber Mfg. Co., see American Tile & Rubber Co. . 11/54
Puro Filter Corporation of America 27/84
Pyramid Metals Co. 11/40
Pyrofax Div., Carbide and Carbon Chemicals Corp. 28/67
Pyroneel Co., Inc., Div. of J. C. Rochester & Co., Inc. 28/62

Q

Quaker City Metal Products Corp. 26/88

R

R-C-A Rubber Co. 11/58
Rackle, Geo., & Sons Co. 3/36
Rawlplug Co., Inc. 16/46
Raymond Concrete Pile Co., Inc. 2/2
Reardon Co. 17/29
Receivador Div. Metal Office Furniture Co. 28/16
Recreation Equipment Co. 21/67
Red Cedar Shingle Bureau 6/55
Reese Metal Weather Strip Co. 16/72
Rees-Volckmann Co., Inc. 4/9
Register & Grille Mfg. Co., Inc. 26/82
Reilly Tar & Chemical Corp.
  Built-up Roofing 6/10
  Wood Preservatives 8/6
Reliable Machine Works, Inc. 28/42
Reliance Steel Products Co., see American Abrasive Metals Co. 11/86
Remington Rand, Inc. 21/24
Republic Fireproofing Co., Inc. 3/11
Republic Steel Corp.
  Pipe 27/4
  Sheet Metal and Chrome Nickel Iron Alloys 13/5
  See also Berger Mfg. Div. Republic Steel Corp. 9/1; 21/2; 24/2
  See also Steel and Tubes, Inc. 23/5
  See also Truscon Steel Co. 15/23
Research Corp. 26/19
Resinous Products & Chemical Co. 8/20
Reuter Bros. Iron Works, Inc. 11/93
Revere Copper and Brass Inc.
  Brass and Copper Pipe 27/11
  Mouldings and Trim 13/6
  Sheet Copper 6/41
  Tanks 27/43
Reynolds Metals Co., Inc.
  Aluminum Paint 17/28
  Insulation 10/5
Richards, Glendon A., Co. 7/7
Richards, J. Merrill
  Diffusing Glass 18/5
  Glass and Concrete Construction 7/8
Richards & Kelly Mfg. Co. 7/15
Richards-Wilcox Mfg. Co., Inc.
  Door Hangers and Hardware 14/42
  Partitions and Wardrobes 20/27
Richardson Roofing, see Flintkote Co. 6/13
Richey, Browne & Donald, Inc. 15/19
Richmond Fireproof Door Co.
  Fireproof Doors 14/26
  Folding Doors and Partitions 20/26
Richmond Radiator Co., Inc. 26/69
Richmond Screw Anchor Co., Inc. 3/46
Ric-wiL Co. 26/120

Riesner, Benjamin
Fuel Oil Storage Tank Ventilators....26/118
Ventilating Brick....7/37
Rittenhouse, A. E., Co., Inc....25/5
Riverton Lime & Stone Co., Inc....4/50
Rixson, Oscar C., Co., Inc....16/24
Roanoke Iron & Bridge Works, Inc....21/46
Roberts Filter Mfg. Co.
Filters....27/50
Swimming Pool Recirculation Systems....21/72
Roberts and Schaefer Co....3/12
Robertson Art Tile Co....11/7
Robertson, H. H., Co.
Floor Wiring System....23/4
Protected Metal....6/34
Skylights....7/9
Steel Floors and Roofs....3/13
Ventilators....7/26
Robinson Clay Products Co....4/41
Rochester, J. C., & Co., Inc., see Pyroneel Co., Inc., Div. of J. C. Rochester & Co., Inc....28/62
Rochester Sash Balance Co., Inc....16/5
Rockwood Sprinkler Co.
Fire Control for Air Conditioning Systems....26/45
Sprinkler Systems....21/32
Roddis Lumber and Veneer Co....14/59
Rolscreen Co....16/58
Rome-Turney Radiator Co....26/70
Roof Specialties Co....6/46
Roof Structures, Inc....3/19
Roosevelt Sheet Metal Works....7/27
Rotary Lift Co....22/10
Rowe Mfg. Co....14/43
Rowles, E. W. A., Co.
Blackboards....21/14
Window Shades....16/100
Royal Ventilator Co....7/28
Ruberoid Co.
Asbestos Shingles....6/18
Built-up Roofing....6/9
Panels....11/34
Pipe Insulation....10/52
Ruda Co., Inc....14/17
Russell, F. C., Insulation Co....15/18a
Rust Engineering Co....26/130
Rust Furnace Co., see Rust Engineering Co....26/130
Rusticraft Fence Co....21/81
Ruud Mfg. Co....27/45

S

Safe Tread Co., Inc....12/11
Safety Process Co., Inc., see Safety Processing Co....12/12
Safety Processing Co....12/12
Sager Metal Weatherstrip Co....16/73
St. Charles Mfg. Co....28/17
St. Louis Fire Door Co....14/18
Samson Cordage Works....16/10
San-Equip Inc....27/18
Sanimetal Tile Corp....11/11
Sanymetal Products Co., Inc....20/21
Sarco Co., Inc....26/52
Sargent Building Specialties Co.
See Equal-Aire Incinerator Div. Sargent Building Specialties Co....28/54
See Windshield Scupper Div. Sargent Building Specialties Co....13/45
Scaife, Wm. B., & Sons Co....27/51
Schundler, F. E., & Co., Inc....10/7
Schwab Furnace & Mfg. Co., see Goder, Joseph, Incinerators....28/56
Schwarze Electric Co., see Stanley & Patterson Div. of Schwarze Electric Co....25/9
Schwerd, A. F., Mfg. Co....8/25
Schwitzer-Cummins Co....26/112
Scott Paper Co....27/111
Scully Steel Products, see United States Steel Corp. Subsidiaries....13/7
Security Fire Door Co....14/28
Security Products Co....15/20
Sedgwick Machine Works....22/11
Selby, Battersby & Co....11/46
Selig Co., Inc....17/44
Servicised Products Corp....11/59
Seth Thomas Clocks Division of General Time Instruments Corp....25/7
Shelby Spring Hinge Co....16/25
Sheldon, E. H., & Co....21/52
Sheldon Slate Products Co., Inc....6/25
Shepard Elevator Co....22/12
Sherwin-Williams Co....17/30
Shirley Corp....28/18
Siems Bros., Inc., see Trussbilt, Div. of Siems Bros., Inc....14/21
Signal Electric Mfg. Co....26/63
Signal Engineering & Mfg. Co....25/6
Sika Inc....5/17
Simmons, John, Co., see Pole and Tube Works, Inc....13/39
Simon Ventilighter Co., Inc....16/86
Simplex Door Co....14/27
Simplon Products Corp....9/12
Sioux Metal Products Co....19/10
Sisalkraft Co....10/2
Sloan Valve Co....27/59
Sloane-Blabon Corp....11/67
Sloane, W. & J.
Mantels....26/140
Partitions....20/10
Telephone Book Racks....21/25
See also Sloane-Blabon Corp....11/67
Smith, Albert D., & Co....16/99
Smith & Egge Div., Turner & Seymour Mfg. Co....16/11
Smooth Ceilings System....3/14
Smyser-Royer Co.
Exterior Lighting Fixtures; Stairs....24/1
Verandas and Railings....13/31
Snead & Co.
Bank and Office Partitions....20/11
Floor Armoring....11/95
Library Equipment....21/26
Soellner, Herman, Inc....28/31
Sonneborn, L., Sons, Inc.
Preservatives, Paints and Varnishes....17/45
Waterproofing....5/18
Soss Mfg. Co., Inc....16/20
Southern Hardwood Producers, Inc....8/15
Southern Prison Co....21/47
Southern Wood Preserving Co....11/82
Spang Chalfant, Inc....27/5
Spanjers, A. J., Co....16/74
Sparta Ceramic Co....11/8
Speakman Co....27/79
Specialty Converters, Inc....10/6

Spencer Heater Div. Lycoming Mfg. Co. 26/100
Spencer Turbine Co. 28/50
Spencer, White & Prentis, Inc. 2/3
Sperzel Modern Seat Co. 27/64
Spiers, Richard N., & Sons, see Payne-Spiers Studios, Inc. .. 18/10
Sprayo-Flake Co. 10/18
Standard Coated Products Corp. 11/70
Standard Conveyor Co., Inc. 21/100
Standard Dry Wall Products, Inc. 5/20
Standard Electric Time Co. 25/8
Standard Store Fronts 19/11
Standard Textile Products Co., see Standard Coated Products Corp. 11/70
Standard Waterproofing Corp. 5/19
Stanley & Patterson Div. of Schwarze Electric Co. 25/9
Stanley Works
  Door Operators 14/30
  Overhead Type Door Hardware 14/44
Stark Brick Co. 4/36
Stearns, E. C., & Co. 28/63
Steel Products Engineering Co., see Combustioneer Div. Steel Products Engineering Co. 26/105
Steel and Tubes, Inc. 23/5
Sterling Windows, Inc. 15/21
Stewart Iron Works Co., Inc.
  Fencing 21/86
  Jail Construction and Equipment 21/48
Stran-Steel Div. Great Lakes Steel Corp. 3/7
Streamline Pipe & Fittings Div. Mueller Brass Co. 27/12
Structural Gypsum Div., American Cyanamid & Chemical Corp., see American Cyanamid & Chemical Corp. 9/23
Structural Slate Co. 11/25
Structural Waterproofing, Inc. 5/21
Struthers-Wells-Titusville Corp., see Titusville Iron Works Co., Div. of Struthers-Wells-Titusville Corp. 26/101
Sturtevant, B. F., Co.
  Fans & Blowers 26/58
  Vacuum Cleaners 28/51
Sullivan Granite Co. 4/6
Sunvent Metal Awning Co. 16/105
Superior Cement Corp. 4/51
Superior Fireplace Co. 26/141
Super-Steel Products Co. 7/12
Surface Combustion Corp. 26/20
Swartwout Co. 7/29
Swedish Venetian Blind Corp.
  Rolling and Folding Doors and Partitions 20/28
  Venetian Blinds 16/87
Sweet's Catalog Service, see Dodge, F. W., Corp. 1/4
Sylvester, Pascal, Co. 11/22
Syracuse Fire Door Corp. 14/19

T

Taber Pump Co. 27/36
Tablet & Ticket Co. 21/98
Taco Heaters, Inc. 27/44
Takapart Products Co. 20/12
Taylor, Halsey W., Co. 27/85
Taylor-Hydrolithic Co., Inc., see Hydrolithic Waterproofing Co., Inc. 5/11
Tendler, David, see Rusticraft Fence Co. 21/81
Tennant, G. H., Co. 17/46
  See also Sperzel Modern Seat Co. 27/64
Thermador Electrical Mfg. Co. 26/26
Thermo-Mix, Inc. 27/80
Thorn, J. S., Co. 15/22
Thrush, H. A., & Co. 26/43
Tile Mfrs. Assn. 11/9
Tile-Tex Co. 11/51
Tirrill Gas Machine Corp. 28/68
Titusville Iron Works Co. Div. of Struthers-Wells-Titusville Corp. 26/101
Toch Brothers Inc. 5/22
Tomkins, Calvin, Co. 9/15
Tracy Mfg. Co. 28/26
Trade-Wind Motorfans, Inc. 26/64
Traffic & Street Sign Co. 13/40
Trane Co. 26/22
Tremco Mfg. Co. 5/23
Trimpak Corp. 8/16
Tri-Lok Co., see Dravo Corp. 11/88
Troy Laundry Machinery Div. of American Machine and Metals, Inc. 28/45
Trumbull Electric Mfg. Co. 23/15
Truscon Laboratories
  Paint 17/31
  Roof Tile and Slabs 3/37
  Waterproofing 5/24
Truscon Steel Co. 15/23
Trussbilt, Div. of Siems Bros., Inc. 14/21
Turner Brass Works 13/32
Turner Resilient Floors, Inc. 6/47
Turner & Seymour Mfg. Co., see Smith & Egge Div., Turner & Seymour Mfg. Co. 16/11
Tuttle and Bailey, Inc. 26/83
Tyler, W. S., Co.
  Elevator Entrances, Cars and General Ornamental Metal Work 14/20
  Escalator Balustrades 22/15
  Ornamental Metal Work 13/33

U

Underpinning & Foundation Co., Inc. 2/4
Union Carbide and Carbon Corp., see Pyrofax Div., Carbide and Carbon Chemicals Corp. 28/67
Union Metal Mfg. Co. 8/23
Union Steel Products Co. 3/47
Unique Balance Co., Inc. 16/6
Unit Heater & Cooler Co. 26/27
"Unit" Structures, Inc. 3/20
United Cork Cos. 10/47
United Metal Box Co., Inc.
  Cabinets and Mail Boxes 27/102
  Kitchen Cabinets 28/19
  Venetian Blinds and Waste Receptacles 16/88
United Metal Products Div. Diebold Safe & Lock Co. 14/22
United States Bronze Sign Co., Inc. 13/34
U. S. Gutta Percha Paint Co. 17/32
United States Gypsum Co.
  Insulation and Sound Control 10/31
  Lathing and Plastering 9/13
  Mason's Lime 4/52
  Open Mesh Partitions 20/37
  Paints 17/33
  Roof, Floor and Partition Products 3/29
  Siding and Shingles 6/19
United States Hoffman Machinery Corp. 28/44

United States Mineral Wool Co. 10/19
United States Plywood Corp.
Cloth Backed Veneer 11/35
Plywood 8/21
United States Quarry Tile Co. 11/10
United States Radiator Corp. 26/102
United States Register Co. 26/84
U. S. Sanitary Specialties Corp. 27/107
United States Steel Corp. Subsidiaries 13/7
See also American Steel & Wire Co. 3/41
See also Cyclone Fence Co. 21/84
See also Universal Atlas Cement Co. 11/24
Universal Atlas Cement Co. 11/24
Universal Bleacher Co. 21/65
Universal Electric Stage Lighting Co., Inc., see Kliegl Bros. 24/7
Universal Metal Sections Div. of Ingot Iron Railway Products Co. 3/22
Universal Roller Screen Co. 16/59
Universal Safety Tread Inc. 12/13
Uno Ventilator Co. 7/30
Upson Co. 10/32
Uvalde Rock Asphalt Co. 11/53

V

Vallas, Lionel
Doors 14/23
Windows 15/25
Van, John, Range Co. 28/29
Van Arsdale-Harris Lumber Co., Inc. 21/68
Van Dorn Iron Works Co. 21/49
Van Kannel Revolving Door Co. 14/49
Van Noorden, E., Co. 7/10
Van Zile Ventilating Co. 16/78
Ven-Ite Co. Inc. 11/14
Ventilighter Co., see Simon Ventilighter Co., Inc. 16/86
Ventilouvre Co., Inc.
Door Ventilators 16/79
Store Front Ventilators 19/12
Vento Steel Products Co. 15/24
Vent-O-Lite Co. 7/13
See also Houston Metal Products Div. of Vent-O-Lite Co. 28/64
Vermont Marble Co. 4/10
Vermont Structural Slate Co. 4/13
Vesco Corp. 13/12
Vickery Stone Co. 11/26
Victor Electric Products, Inc. 26/65
Virginia Greenstone Co., Inc. 4/16
Vitra Seal Co., Inc. 17/47
Vitreous Enameling & Stamping Co., Inc., see Vesco Corp. 13/12
Vogel Peterson Co., Inc. 21/92
Vonnegut Hardware Co. 16/39
Voorhees Rubber Mfg. Co., Inc. 11/61
Vortex Mfg. Co. 5/25
Vulcan Rail & Construction Co. 13/41

W

Wagner Mfg. Co. 22/18
Wallace & Tiernan Co. Inc. 21/71
Walsh-Spencer Co. 27/89
Warner Elevator Mfg. Co. 22/13
Warren Telechron Co. 25/10
Warren Venetian Blind Co. 16/89
Wasco Flashing Co. 6/48
Wasem Plaster Co. 9/24
Washburn & Granger, Inc. 28/65
Washington Concrete Corp. 11/15
Waterfilm Boilers, Inc. 26/99
Waterloo Register Co. 26/85
Waterman-Waterbury Co. 26/21
Watson Mfg. Co., Inc. 16/60
Wayne Iron Works 21/66
Weber Costello Co. 21/15
Webster, W. F., Cement Co. 5/26
Webster, Warren, & Co. 26/44
Weil Pump Co. 27/37
Weis, Henry, Mfg. Co., Inc.
Shower Cabinets 27/74
Toilet Partitions 20/22
West Disinfecting Co. 27/108
West Dodd Lightning Conductor Corp. 23/20
West Wind Corp. 26/66
Western Concrete Pile Corp., see Western Foundation Co. 2/5
Western Electric Co. 25/14
Western Engineering & Mfg. Co. 7/31
Western Foundation Co. 2/5
Western Pine Assn. 8/17
Western Rotary Ventilator Co., Inc., see Western Engineering & Mfg. Co. 7/31
Western Venetian Blind Corp. 16/90
Western Waterproofing Cos. 5/27
Western Wire & Iron Works, Inc. 20/36
Westinghouse Electric & Mfg. Co.
Electrical, Air Conditioning and Refrigeration Equipment 23/16
Lighting Fixtures 24/10
Micarta 11/36
See also Bryant Electric Co. 23/8
Wheeler-Osgood Sales Corp.
Doors 14/60
Plywood 8/22
Wheeling Corrugating Co.
Floor Construction 3/15
Roof and Floor Decks 3/25
Wheeling Steel Corp. 27/6
White Cabinet Corp. 28/20
White Pine Sash Co. 15/33
Whitehead Metal Products Co., Inc.
Sinks and Cabinets 28/27
Tanks 27/54
Whitney Duplicating Check Co. 21/93
Whitney, Vincent, Co. 16/36
Wickwire Spencer Sales Corp., see Wickwire Spencer Steel Co. 26/86
Wickwire Spencer Steel Co.
Concrete Reinforcement 3/48
Fences and Fencing 21/87
Grilles 26/86
Radiator Enclosures 26/89
Wire Lath 9/14
Wiggin's, H. B., Sons Co. 11/71
Wilbur & Williams Co. 17/34
Wilkinson, C. M., Co. 28/49
Williams Oil-O-Matic Heating Corp.
Oil Burning Equipment 26/103
Refrigerators 28/38
Williams Pivot Sash Co. 16/29
Willis Mfg. Co. 15/26
Wilson, J. G., Corp. 14/37
Wilson Metal Products Co. 11/41
Windshield Scupper Div. Sargent Building Specialties Co. 13/45
Wing, L. J., Mfg. Co. 26/59

Wiremold Co. 23/6
Wood Conversion Co. 10/33
Wood-Mosaic Co., Inc. 11/80
Wood Preserving Corp. 8/7
Woodville Lime Products Co. 9/22
Wooster Products Inc. 12/14
Worth Lumber Co. 11/84
Wright Rubber Products Co. 11/60

Y

Yale & Towne Mfg. Co., see Norton Door Closer Co., Div. of the Yale & Towne Mfg. Co. 16/27
Yardley Venetian Blind Co. 16/91
Yeomans Brothers Co. 27/38
York Ice Machinery Corp.
Air Conditioning 26/23
Refrigeration 28/39
Refrigerator Doors and Windows 28/35
York Safe and Lock Co. 21/39
Young Radiator Co. 26/28
Youngstown Mfg., Inc. 11/42

Z

Zanin Brass Corp. 11/23
Zimmerman, G. F. S., Co., Inc. 16/37
Zonolite Co. 10/20
Zouri Store Fronts 19/13
Zurn, J. A., Mfg. Co. 27/28

INDEX TO SECTIONS

Numbers Refer to Sections

A

ACID
Proofing, see
—Paint—Acid, Alkali or Oil Resistant 17
—Waterproofing—Paint and Compounds; Hardeners and Densifiers 5

ACCELERATORS
Cement, Concrete or Mortar 5

ACCESS
Doors, see Doors—Access 27
Units, see Doors—Access 27

ACCUMULATORS
Water 26

ACETYLENE
For Welding, see Welding—Accessories and Supplies 1

ACOUSTICAL
Cement, see Cement—Acoustical ... 10
Material Surfacing, see Paint—Acoustical—Material Surfacing 17
Materials and Treatments 10

ADHESIVES
See Specific Kind as:
Cement for Application of Insulation, Glue, etc. 10
Linoleum Paste—Linoleum to Felt, Wood, Concrete 11
Paste—School 21

ADJUSTERS
Casement Window, see Hardware—Casement Window — Adjusters and/or Stays 16
Screen and Storm Sash, see Hardware Adjusters—Screen and Storm Sash. 16

ADMIXTURES
See Specific Type as:
Hardeners and Densifiers; Waterproofing; Anti-freeze Compounds 5

AFTERCOOLERS 26

AGGREGATES
Abrasive 11
Concrete—Lightweight 4
Metal 11
Terrazzo, see Terrazzo—Aggregates. 11

AGITATORS
Tank 27

AIR
Cleaning Systems, see Vacuum Cleaners 28
Compressors, see Compressors—Air, Gas or Steam 26
Controlling Heads, see
—Dampers or Registers 26
—Ventilators—Mushroom 7
Deflectors, see
—Dampers or Registers 26
—Ventilators—Mushroom 7
Diffusers, see
—Dampers or Registers 26
—Louvers 26
—Ventilators—Mushroom 7
Eliminators, see Valves 26
Filters, see Filters—Air 26

AIR—Cont.
Heaters, see Heaters—Air; Furnaces—Warm Air; Ventilating System; Heaters—Unit, etc. 26
Louvers, see Louvers 26
Washers, see Washers—Air 26

AIR CONDITIONING
Apparatus and Equipment, see Specific Product 26
Central Plant System, see Air Conditioning—Units — Combined with Coal, Gas or Oil Furnaces—Central Plant System 26
Controls, see Controls—Air Conditioning 26
Cooling and Heating Units Combined, see Coolers—Unit—Heater Combination 26
Dampers, see Dampers or Registers .. 26
Grilles, see Dampers or Registers 26
Heating and Cooling Units, see Heaters—Unit—Cooler Combination .. 26
Louvers, see Louvers 26
Registers or Grilles, see Dampers or Registers; Grilles or Screens 26
Room Coolers, see Coolers—Unit 26
Summer Air Conditioning, see Coolers—Unit 26
Units—Combined with Coal, Gas or Oil Furnace—Central Plant System 26
Units—Combined with Warm Air Furnaces, see Furnaces—Warm Air—Forced Circulation 26
Units—Complete, see Air Conditioning Units—Combined with Coal, Gas or Oil Furnace—Central Plant System 26
Units—Cooling, see Coolers—Unit .. 26
Units—Filter, Moistener and Washer . 26
Units—Heating, see Heaters—Unit .. 26
Windows, see Sash—Storm; Windows Double Glazing 15

ALARMS
Automatic—Rate of Rise—Air Conditioning 26
Burglar 25
Fire 25
Sprinkler System Supervision, see Sprinkler Supervisory Service 21
Tank—High or Low Water, see Signal Systems—Electric—Tank Alarm 25

ALLOYS
Metal, see Metals; Sheet Metal, etc.. 13

ALTARS
Church, see Ecclesiastical Furniture and Accessories 21

ALUMINIZING
See Paint—Aluminizing or Bronzing. 17

ALUMINUM
See Specific Form of Product as:
—Castings 13
—Cooking Utensils 28
—Foil 10
—Insulation, see Specific Types as: Insulation—House; Wallboard—Aluminum Foil Covered 10
—Metals and Alloys 13
—Shapes 13
—Skylights 7
—Store Front 19

ALUMINUM—Cont.
Paste and Powder 17
Plastic 13
AMMETERS 23
AMMONIA CONTROL
Apparatus 21
AMPLIFIERS
Radio, Public Address, etc., see Public Address—Systems 25
ANCHORS
Ashlar, see Ties—Wall—Metal 3
Concrete Inserts, see Inserts—Concrete 3
Door Buck 3
Expansion Bolt, see Bolts—Expansion 16
Floor Sleeper, see Clips—Floor Sleeper 3
Screw—Concrete, Plaster, etc. 16
Shelf Angles 3
Veneer Wall 3
Window Cleaners' Belt, see Window—Cleaners' Safety Devices 16
ANDIRONS
Fireplace, see Fireplace—Accessories. 26
ANGLES
Corner—Expanded Metal, see Lath—Metal—Interior Corner Reinforcement 9
Non-structural, see Extruded or Drawn Metal Shapes 13
Structural, see Shapes—Structural ... 3
ANNUNCIATORS
Elevator, see Signal Systems—Electric Elevator 22
Hospital, see Signal Systems—Electric—Hospital 25
ANTHRACENE
Oil, see Preservatives—Wood 8
ANTIFREEZE COMPOUNDS
Concrete and Mortar 5
ANTIPANIC
Door Equipment, see Exit—Devices—Fire or Panic 16
APRONS
Sink, see Sinks 28
ARCH
Roof Construction 3
ARCHED
Ceilings, see Ceilings—Vaulted 3
Metal—Corner Bead, see Furring—Cold Formed Channels 9
ARCHES
Floor, see Floor Construction 3
Metal — Lath, see Lath—Arches or Columns Formed—Metal 9
Vaulted, see Ceilings—Vaulted 3
ARCHITECTURAL
Metal Work, see Ornamental—Metal Work; Shapes—Non-structural .. 13
Terra Cotta, see Terra Cotta—Architectural 4
Wood Work, see Cabinet Work—Wood; Millwork 8
ARMOR
Concrete and Asphalt Floor, see Grids—Flooring for Armoring 11
Concrete — Asphalt Floor — Static Elimination, see Grids—Flooring—Electrical Grounding 11
ART
Gallery Fittings 21
Marble 11
Tile—Board, see Wallboard—Tiled .. 11

ARTIFICIAL
Stone, see
—Stone—Cast 4
—Art—Marble 11

ASBESTOS
Covered—Sheet Metal, see Sheet Metal—Steel Asbestos Covered... 6
Insulation, see Specific Type as Insulation—House 10
Wallboard—Asbestos—Cement, see Wallboard—Asbestos—Cement .. 11

ASHLAR
Products, see Particular Material as Terra Cotta; Stone; Granite..... 4

ASPHALT
Basic 6
Blocks—Flooring and Paving, see Flooring—Asphalt—Block or Brick 11
Brick, see Flooring—Asphalt—Block or Brick 11
Cement, see Asphalt—Emulsion 5
Cement, see Cement—Roofing..... 6
Emulsion—Cold Application 5
—Hot Application, see Asphalt—Basic 6
Mastic Flooring, see Flooring—Asphalt Mastic 11
Paving Blocks, see Flooring—Asphalt —Block or Brick..... 11
Planks, see Flooring—Asphalt Plank. 11
Roofing, see Roofing—Built-up—Felt and Fabric; Roofing—Roll..... 6
Shingles, see Shingles—Asphalt..... 6
Tile, see Flooring—Asphalt Tile.... 11
Waterproofing, see Waterproofing—Paint and Compounds..... 5

ASTRAGALS
Hardware, see Hardware—Astragal.. 16

AUXILIARY OR EMERGENCY
Power Equipment, see Lighting and Power Systems—Electric—Emergency or Exit Lighting..... 23

AWNING
Blinds, see Blinds—Awning..... 16

AWNINGS
Canopies, see Awnings—Canvas or Fabric 16
Canvas or Fabric..... 16
Metal—Fireproof 16
Porch, Terrace, etc...... 16
Rollers and/or Operating Mechanisms for 16
Roof 16
Store Front, see Store Front—Awnings 16
Venetian Blind—Window, Porch, Terrace, etc. 16

AXES
Fire, see Fire—Extinguishing Apparatus 21

B

BACKING
Stone, see Waterproofing; Dampproofing 5

BACKSTOPS
Baseball, see Fences and Fencing—Chain Link 21
Basket Ball, see Basket—Ball—Backstops 21

BADMINTON
Courts 21

BAFFLE
Gates, see Gates—Baffle—Railroad Station, etc. 21

BAKE
Ovens, see Ovens—Baking..... 28

BALANCES
Sash—Adjustable or Standard..... 16
Sash—Spring 16

BALUSTRADES
Escalator 22
Metal, see Railings—Metal; Ornamental—Metal Work 13
Metal, see Fences and Fencing—Iron 21

BAND AND ORCHESTRA
Shells 3

BAND WAGONS
Theater, see Elevators—Theater, Orchestra, Organ Console, Stage, etc. 22

BANK
Vaults, see Vaults..... 21

BANK SCREENS
Metal, see
—Partitions—Bank and Office; Grilles and Guards—Bank 20
—Ornamental—Metal Work..... 13

BAR
Beer Coolers for, see Coolers—Beer, Milk, Beverage, etc..... 28
Facing and Back Bar Material, see Specific Material as Panels—Phenolic Fiber..... 11
Furniture, see Furniture—Bar..... 21
Service Units, see Service Units—Beer, Liquor, etc..... 28
Tops—Phenolic Fiber, see Panels—Phenolic Fiber 11

BARGES
Steel 3

BARN
Equipment 21

BARRELS
Deep Well, see Pumps—Deep Well.. 27
Storage Racks for, see Racks—Barrel Storage 28

BARS
Binding—Floor and Cove Base, see Dividers—Cove Base..... 11
Binding—Floor Covering, see Edgings Floor Coverings 11
Curb—Concrete 13
Door—Push 16
Extension, see Hangers—Pipe—Hanger—Iron For 26
Metal, see Rods and Bars..... 13
Rack—Refrigerator 28
Reinforcing 3
Ties, Spacers, Hangers, etc., for, see Bars—Reinforcing 3

BAS RELIEFS
Bronze, see Ornamental—Metal Work; Tablets — Bronze, Brass, Aluminum; Statuary—Metal..... 13

BASE
Beads, see Beads—Base; Beads—Base—Metal Strips for Terrazzo Floor... 9
Combined with Electrical Distribution System — Metal, see Conduit—Electrical—Combined with Base.. 23
Cove, see Cove—Base—Metal..... 9
Metal, see Cove—Base—Metal..... 9
Screeds and Grounds
—Metal 9
—Plastic—Colored 11
Stucco or Plaster, see Lath; Lath—Metal and Insulation—Combination 9
Wall, see Cove Base—Metal..... 9

BASES
Column, see Caps and Bases—Column 3
Flag Pole, see Flag Pole—Bases.... 13
Post, See Caps and Bases—Post.... 3
Ventilator—Roof, see Ventilator Bases 7

BASEBOARDS
See Trim..... 11

BASINS
Gravel, see Catchbasins 27
Pump and Blow-off..... 27
Wash, see Lavatories..... 27

BASKET
Ball—Backstops 21
Gymnasium 21
Racks, see Racks—Basket..... 21

BATH HOUSE
Checking Equipment 21

BATHROOM ACCESSORIES
Ash Tray 27
Bathtub Seat 27
Cabinets 27
Concealed Lavatory Unit..... 27
Electric Air Heaters or Radiators, see Heaters—Air—Electric—Auxiliary or Bathroom 26
Holders—Paper Towel or Napkin... 27
Holders—Soap, Tumbler, Tooth Brush, Sponge, etc...... 27
Holders—Toilet Paper..... 27
Lighting Fixtures, see Lighting Fixtures—Electric—Interior 24
Medicine Cabinets, see
—Cabinets—Hospital 21
—Bathroom Accessories—Cabinet. 27
Mirrors, see Mirrors—Plate Glass.... 18
Razor Blade Receptacles..... 27
Robe Hooks 27
Shelves 27
Strop Hooks 27
Towel Bars or Racks, Grab Rails, etc. 27
Towel Baskets 27

BATHS
Bird, see Furniture—Garden..... 21
Rubber—Foot 21
Shower—Curtain Rings for, see Curtains—Hooks for..... 20
Shower or Needle..... 27
Shower or Needle—Glass Shields for, see Doors—Shower Stall—Glass; Shields—Bathtub—for Showers... 27
Shower or Needle—Stalls for, see Stalls—Shower Bath..... 27

BATHTUB
Fittings 27
Hangers 27
Shields for Showers, see Shields—Bathtub—for Showers..... 27

BATHTUBS
Porcelain Enameled or Vitreous China 27

BATTERIES
Storage 23

BATTEN
Strips, see Wallboard—Joint Finisher 11

BATTERY
Charging Equipment 23
Eliminators, see Eliminators—Battery. 23

BEACONS
Airway, see Ornamental—Metal Work 13

BEADING
Rubber Table Tops..... 11

BEADS
Base 9
Base—Metal Strips for Terrazzo Floor, see Strips—Metal—Base Beads for Terrazzo Floor 11
Corner—Metal 9

BEAM
Coverings—Metal Lath, see Lath... 9
Coverings—Tile, See Tile Form—Hollow Gypsum; Tile—Hollow—Clay or Terra Cotta..... 4
Hangers, see Hangers—Beams, Joist, Wall, etc. 3
Wrapping, see Caging—Wire—Beam —Girder or Column..... 3

BEAMS
Structural, see Structural—Shapes Angles, Channels, I-Beams, Bars, Trusses, etc. 3

BEARINGS
Ball 16

BED PAN
Washers and Sterilizers, see Steriiizers —Hospital 21

INDEX TO SECTIONS

BEDS
Closet—Portable 21
Disappearing or Built-in 21
BEECH
Lumber, see Lumber—Beech 8
BEER
Coolers, see Coolers—Beer, Milk, Beverage, etc. 28
BELLS
Church, Tower, Clock, Fire Alarm, School, Peal, etc. 21
Hand—Garden or House 21
BELLS AND BUZZERS
Electric 25
BELTS
Window Cleaners' Safety, see Window Cleaners—Safety Devices 16
BENCHES
Garden, see Furniture—Garden 21
Locker Room, see Lockers—Steel ... 21
Steel—Jail 21
Work 21
BENDERS
Conduit, see Conduit—Electrical ... 23
BENDS
Pipe, see Pipe—Bends 26
BEVERAGE
Coolers, see Coolers—Beer, Milk, Beverage, etc. 28
BILLETS
Wrought Iron 13
BINDING BARS
Strips — Metal, see Edging — Floor Covering 11
BINS
Storage—Steel, see Shelving—Steel . 21
Storage—Steel Plate, see Steel—Plate Construction 3
Vegetable, see Cabinet—Accessories . 28
Wine or Bottle Storage, see Bottle—Racks 28
BINS AND BUNKERS
Mouldings and Joining Strips 21
Steel, Wood, Tile, etc. 26
BIRD
Baths, see Furniture—Garden 21
BLACKBOARD
Chalk Trough Insert and Eraser Cleaner 21
Chalk Troughs 21
Display Rails or Racks 21
Erasers 21
Frames 21
Joining Strips, see Blackboard—Mouldings and Joining Strips 21
Mouldings and Joining Strips 21
Tack Strips 21
BLACKBOARDS
Composition 21
Disappearing 21
Disappearing—Motor Operated 21
Glass 21
Slate 21
BLANKET
Warmers 21
BLAST
Furnaces or Cores, see Coils or Cores—Fin Type—Heat Transfer or Cooler 26
Plate 13
BLEACHER
Seat Brackets, see Castings—Stadium Seat 13
BLEACHERS
Seating 21
BLINDS
Awning 16
Lightproof, see Shades—Lightproof . 16
Porch, see Shades—Window, Skylight, etc.; Blinds—Venetian 16
Rolling—Outside 16
BLINDS—Cont.
Venetian—Cloth 16
Venetian—Metal 16
Venetian—Metal—Outside 16
Venetian—Wood 16
Venetian—Wood—Outside 16
Ventilating, see Shades—Window, Skylights, etc. 16
Wood—Outside 16
BLOCKS 4
Acoustical, see Acoustical—Materials and Treatments 10
Asphalt—Flooring and Paving, see Flooring—Asphalt Brick or Block .. 11
Cinder Concrete—Aggregates 3
Flashing, see Flashing—Blocks 6
Furring, see —Insulation—House 10
Tile Form—Hollow Gypsum; Tile—Hollow Clay or Terra Cotta 4
Glass, see Brick—Glass 4
Granite, see Granite 4
Gypsum, see Tile Form—Hollow—Gypsum 4
Hollow Glass, see Tile Form—Hollow—Glass; Brick—Glass 4
Hollow Tile, see Tile—Hollow—Clay or Terra Cotta; Tile Form—Hollow—Gypsum; Tile—Hollow or Solid—Cylinder Concrete 4
Insulating, see Insulation—High Temperature—Moulded or Segmental—Brick, Block, etc.—Pressed or Corrugated 10
Insulating—Setting Cements for, see Cement—for Application of Intion 10
Lightweight Concrete 4
Lightweight Concrete—Metal or Porcelain Faced 13
Nailing Concrete, see —Tile Form—Hollow or Solid—Cinder Concrete 4
Nailing Concrete, see Nailing Concrete 3
Paving—Asphalt, see Flooring—Asphalt—Brick or Block 11
Paving—Granite 4
Paving—Rubber, see Flooring—Rubber Tile Form 11
Roof, see Tile—Roofing 6
Segment Tile, see Tile—Hollow Clay or Terra Cotta—Segmental and Flat Arch 4
Slate, see Slate 11
Wood — Flooring and Paving, see Flooring—Wood Block 11
X-Ray Protective, see Tile—X-Ray Protective 10
BLOWERS
Centrifugal 26
Forced Draft 26
Furnace, see Furnaces—Warm Air—Forced Circulation Units for—with or without Filters or Air Moistener 26
Organ 26
Pneumatic Tube System 26
Pressure or Volume 26
Turbo 26
Ventilating or Exhaust 26
Ventilator, see Ventilators—Power .. 7
BLUE
Lead, see Lead—Blue—Sublimed ... 17
BLUE PRINT
Filing Cabinets, see Cabinets—Blue Print and Plan Filing 21
BLUESTONE
Ashlar 4
Natural 4
BOARDS
Asbestos, see Wallboards—Asbestos-Cement 11
Black, see Blackboards 21
Bulletin, see Bulletin—Boards 21
Directory, see Directories—Building . 21
BOARDS—Cont.
Diving, see Diving Boards—Automatic Adjustable 21
Fiber, see Wallboard—Fiber 10
Phenolic Fiber—see Panels—Phenolic Fiber 11
Plaster, see Wallboard—Gypsum; Lath 9
Plywood, see Plywood 8
Tack, see Blackboard Tack Strips ... 21
Wall, see —Plywood 8
—Wallboard—Fiber 10
—Wallboard—Gypsum 9
Wall—Tiled, see Wallboard—Tiled . 11
BOILER
Breechings, see Steel—Plate Construction 3
Feeders, see Regulators—Feed Water 26
Fronts 26
Insulation, see Insulation — High Temperature 10
Low Water Protector 26
Plate Work, see Steel—Plate Construction 3
Return Traps, see Traps—Steam 26
Settings—Brick 26
Tube Cleaners, see Soot—Blowers and Cleaners 26
Tubes, see Tubes and Tubing Boilers 26
Water Treatments, see Filters; Softeners—Water, etc. 27
BOILERS
Clothes—Stationary 28
Galvanized—Hot Water Storage 27
Heating—Coal or Coke Fired—Combination Heat and Hot Water ... 26
Heating—Coal or Coke Fired—Steam, Vapor or Hot Water 26
Heating—Fire Tube or Water Tube . 26
Heating — Gas Fired — Combination Heat and Hot Water 26
Heating—Gas Fired—Steam, Vapor or Hot Water 26
Heating—Locomotive Firebox 26
Heating—Magazine Feed 26
Heating — Oil Fired — Combination Heat and Hot Water 26
Heating—Oil Fired—Steam, Vapor or Hot Water 26
Heating—Sectional—Coal, Gas or Oil Fired 26
Heating—Smokeless 26
Heating—Stoker Fired 26
Hot Water Supply, see Heaters—Water 27
Power—Fire Tube or Water Tube .. 26
Range—Copper, Nickel Copper Alloy, Galvanized Steel, etc. 27
Range — Heater Combination, see Heaters—Water—Gas—Combination Water Tank and Heater; Heaters—Water—Oil—Combination Water Tank and Heater 27
Range—Steel—Cement Lined 27
Register, see Dampers or Registers .. 26
Scotch Marine 26
Wash, see Laundry—Equipment and Machinery 28
BOLTS
Casement Window or Door 16
Cremone (Cremorne) 16
Door or Window 16
Door—Emergency Exit, see Exit—Devices—Fire or Panic 16
Expansion 16
Lavatory Door 20
Rib, see Nuts and Bolts—Rib 3
Sink 27
Toggle 16
BONDING
Forms, see Forms—Metal 3
BONDING COMPOUNDS
Concrete 5
Plaster—See Plaster—Bond 5
BONDS
For Woods and Other Laminae 8

BOOK
Cases—Wood, see Cabinet Work; Millwork 8
Distributor—Library 21
Lifts, see Lifts—Book; Dumbwaiters. 22
Slates 21
Stack Accessories 21
Stacks—Library 21
Stacks—Metal 21

BOOTHS
Coupon 21

BOOTS
Conductor, see Shoes—Leader..... 6

BORDER
Lights, see Stage—Fittings and Lighting—Electrical 24

BORINGS
Test—Foundation 1

BOTTLE
Racks 28

BOTTLED
Gas, see Gas—Tanked or Bottled... 28

BOWLS
Sink, see Sink—Bowls..... 28
Stock Watering—Automatic 21

BOXES
Control Lens 24
Feed, see Barn—Equipment..... 21
Fire Alarm, see Alarms—Fire..... 25
Flower 21
Gutter—Street 13
Ice, see Refrigerators—Ice Cooled... 28
Letter or Mail, see Letter or Mail—Boxes 21
Mail Chute, see Chutes—Mail..... 21
Meter—Vitrified Clay 23
Outlet—Electric Clock or Fan Hanger 23
Outlet—Electric—Floor—Adjustable and Non-adjustable 23
Pull Electric 23
Register, see Dampers or Registers.. 26
Safe Deposit 21
Tool 21
Valve 13
Wall—Metal—For Electrical Outlets. 23
Wall—Metal—For Hangers 3
X-Ray Film Transfer, see Cabinets—X-Ray Film Transfer..... 21

BRACKETS
Ceramic—Shelf, Towel Bar, etc., see Tile — Clay — Floor and Wall — Glazed, Unglazed Matt, or Brite—Non-Vitreous, Semi-Vitreous, Vitreous, Impervious—Dust Pressed and/or Plastic 11
Column, see Caps and Bases—Column 3
Door Closes..... 16
Lamp, see Standards and Brackets—Lamp; Lighting Fixtures 24
Lavatory, see Lavatory—Brackets or Chairs 27
Pipe, see Hangers—Pipe; Rolls—Pipe 26
Radiator, see Radiator—Hangers.... 26
Shelving—Adjustable, see Hardware.. 16
Showcase 16
Sink 27
Sliding Door, see Hangers — Door, Partition or Gate..... 16
Window—Ventilator, see Ventilators—Window—Brackets for 16

BREECHINGS
Smokestack, see Steel—Plate Construction 3

BRICK
Acid Resistant, see Brick—Floor—Packing House, Battery Room, etc. 4
Asphalt, see Flooring — Asphalt — Brick or Block..... 11
Ceramic—Glazed 4
Cleaning Compound 5
Common—Clay; Sand, Lime, etc..... 4

BRICK—Cont.
Cork, see Insulation—Cold Storage or Refrigeration 10
Cork Composition, see Flooring Cork Composition 11
Enameled 4
Face or Front..... 4
Fire, see Refractory..... 10
Floor—Packing House, Battery Room, Dairies, etc. 4
Glass, see Blocks—Glass..... 4
Glazed, see Brick—Salt Glazed; Brick—Enameled 4
Hollow 4
Hollow Tile, see Tile—Hollow, Clay or Terra Cotta—Load Bearing.... 4
Insulation, see Insulation—High Temperature—Moulded or Segmental Block, Brick, etc.—Pressed or Corrugated 10
Paving 4
Porcelain—see Brick—Enameled ... 4
Salt Glazed 4
Salt Glazed—Smooth 4
Special Shapes—Moulded, Arch, etc. 4
Veneer Base, see Lath; Lath—Metal and Insulation—Combination 9
Ventilators, see Ventilators—Wall—Common Brick Size..... 7

BRICK SIZE
Ventilators—Wall, see Ventilators—Wall—Common Brick Size..... 7

BRICKS
Door, see Frames—Door..... 14

BRIDGE
Protection, see Paint—Acid, Alkali or Oil Resistant; Paint—Metal Protective; Preservatives—Metal.. 17
Racks 13

BRIDGES
Rustic 21
Steel, see Structural—Steel—Fabricators, Designers and Welders.... 3
Suspension 3

BRIDGING
Joist 3

BRIDLE RACKS..... 21

BROILERS
Coal, Charcoal, Electric or Gas..... 28

BRONZE
Architectural, see Ornamental—Metal Work 13
Extruded, see Extruded or Drawn Shapes; Shapes—Non-structural.. 13
Fountains, see Fountains—Drinking—Brass, Bronze, etc..... 27
Ornamental, see Ornamental—Metal Work 13
Tablets, see Tablets..... 13

BROWN SANDSTONE
Artificial, see Stucco—Portland Cement—Colored—Premixed 9
Natural 4

BRUSHES AND MOPS..... 28

BUBBLING CUPS
Drinking, see Fountains—Drinking.. 27

BUCKS
Door, see Frames—Door..... 14

BUFFERS
Door 16

BUILDING
Fronts, see Front Work; Store Front Construction 19

BUILDINGS
Glass, see Greenhouses and Conservatories 21
Glass—Corrugated, see Glass—Corrugated Wire 18
Industrial—Reinforced Concrete or Brick and Steel..... 3
Porcelain Enameled, see Sheet Metal—Vitreous or Porcelain Enameled; Front Work 13
Standardized—Steel 3

BULKHEADS 13

BULLETIN
Board—Display Racks, see Blackboard—Display Rails or Racks..... 21
Boards 21
Boards—Changeable Letter or Strip.. 21

BULLETINS
See Tablets 13

BULLETPROOF
Glass, see Glass—Safety..... 18

BUMPERS
Seat 27

BUMPERS AND STOPS
Door 16

BUNKER
Pans 28

BUNKS
Jail 21

BUOYS
Cork 21
Steel 26

BURGLAR ALARMS
Electric, see Alarms—Burglar..... 25

BURNERS
Coal, see Stokers..... 26
Garbage, Rubbish, Waste, Sewage, Sludge Cake and Screening..... 28
Gas 26
Kitchen Range—Oil Fired..... 28
Oil and/or Equipment..... 26
Oil and Gas Combination..... 26

BURNING EQUIPMENT
Coal, see Stokers; Burners—Powdered Fuel 26
Oil, see Burners—Oil and/or Equipment 26

BUSBAR
Systems, see Conduit — Electrical-Busbar Systems 23

BUSTS
Metal, see Statuary—Metal..... 13
Wood, see Statuary Wood..... 21

BUTCHER
Rails 28

BUTTS
Metal, see Hinges—Butt..... 16

BUZZERS
Electric, see Bells and Buzzers—Electric 25

C

CABINET
Accessories 28
Clothes Dryer, see Dryers—Clothes.. 28

CABINET
Hardware, see Hardware 16
Sinks, see Sinks—Kitchen Cabinet Combination 28
Tops 28
Towel Dryers, see Dryers—Towel... 28

CABINET WORK
Plywood, see Plywood 8
Wood 8

CABINETS
Base, see Cabinets—Kitchen..... 28
Bathroom, see Bathroom Accessories—Cabinets 27
Blue Print and Plan Filing..... 21
Broom 28
China or Dish—Wood or Metal..... 28
Dressing, see Cabinets—Wall—Dressing and Desk..... 27
Filing, see Filing Equipment..... 21
Fire Extinguisher 21
Key 21

CABINETS—Cont.
Fire Proof Safes, see Filing Equipment 21
Hose—Fire 21
Hospital — Instruments, Warming, Bedpan, etc. 21
Instrument, see Cabinets—Hospital. 21
Ironing Board 28
Key 21
Kitchen—Combined with Gas or Electric Range, see Ranges—Gas or Electric—Kitchen Cabinet Combination 28
Kitchen — Combined with Refrigerator, see Refrigerator—Kitchen Cabinet Combination 28
Kitchen—Metal 28
Kitchen—Wood 28
Linen 28
Medicine, see —Bathroom Accessories—Cabinets 27 —Cabinets—Hospital 21
Metal, see —Cabinets—Metal Storage ..... 21 —Cabinets—Hospital ..... 21 —Cabinets—Kitchen—Metal 28
Metal—Storage 21
Panelboard—Electric, see Panelboards —Lighting and Power—Dead and Live Load 23
Paper Towel, see Bathroom Accessories 27
Plan, see Cabinets—Blue Print and Plan Filing 21
Radiator, see Radiator—Covers and Cabinets 26
Refrigerator, see Refrigerators—Electric 28
Register, see Dampers or Registers, Louvers—Air Conditioning 26
Shower Bath 27
Sink, see Sinks—Kitchen Cabinet Combination; Cabinets—Undersink 28
Stationary, see Cabinets — Metal — Storage 21
Storage, see Cabinets—Metal—Storage 21
Telephone 21
Toilet Paper, see Bathroom Accessories 27
Towel, see Bathroom Accessories—Holders—Paper Towel or Napkin. 27
Undersink 28
Wall—Desk and Dressing Table 27
Wall — Kitchen, see Cabinets — Kitchen 28
Wall—Medicine, see Bathroom Accessories—Cabinets 27
Wardrobe, see Wardrobes 21
Wood—Storage 21
X-Ray Film Safety Storage 21
X-Ray Film Transfer 21
X-Ray—Viewing 21

CABINS
Wood 21

CABLE
Equalizers 22

CABLES
Electric, see Wire and Cables—Electric 23

CABS
Elevator, see Cars—Elevator 22

CAEN STONE
Reproduction, see —Stone—Cast ..... 4 —Stucco—Portland Cement—Colored—Premixed; Plaster—Texturing—Colored; Scagliola .... 9 —Paint—Texturing 17

CAFETERIA AND RESTAURANT
Equipment, see Furnishings and Equipment—Cafeteria and Restaurant.. 28

CAGES
Bank and Office, see Partitions—Bank and Office Cage 20
Stock Room, see Partitions—Open Mesh 20

CAGING
Wire—Beam, Girder and Column ... 3

CAISSONS
Concrete — Expansion Joints, see Joints—Expansion—Concrete 3
Contractors or Engineers, see Contractors — Piling; Contractors — Concrete Construction; Engineers—Foundation; Engineers — Concrete Construction 2

CALCIMINE
Paint, see Paint—Water 17

CALKING, see Caulking 5

CALLING
Systems, see Signal Systems—Electric; Telephone and/or Signal System Combination 25

CAMES
Glazing 18

CANDELABRAS
Electric, see Standards and Brackets—Lamp; Lighting Fixtures 24

CANDLESTICKS 21

CANE
Metal—Fabric, see Metal Fabric—Woven 26

CANOPIES
Canvas, see Awnings—Canvas or Fabric 16
Marquises, see Marquises 13
Metal 13
Sidewalk 16
Store Window, etc., see Store Front Awnings 16

CANS
Ash—Hoisting—Swing Bail or Side Handle 26
Ash—Trucks for, see Trucks—Ash Can 26

CANVAS
Cement 6
Flashing, see Flashings—Fabric, Asbestos, etc. 6
Roofing and Deck 6
Wall Coverings 11

CAPACITORS
Electric 23

CAPITALS
Composition 8

CAPS
Wainscot—Tile, see Tile 11

CAPS AND BASES
Column 3
Post 3

CAPS AND POTS, CHIMNEY
Clay, Terra Cotta or Art Marble, see Chimney—Caps and Pots 4

CAPS AND TOPS
Chimney, see Chimney Tops 4

CARBIDE
For Welding, see Welding—Accessories and Supplies 1

CARBORUNDUM
Non-slip—Ceramic—see Tile Paving —Non-slip 11

CARILLON, see Chimes—Tower 21

CARPET
Cork, see Cork—Carpet 11

CARPETS, see Rugs and Carpets 11

CARREL
Study, see Book—Stacks 21

CARRIAGE CALLING SYSTEMS, see Signal Systems—Electric—Carriage Calling 25

CARRIERS
Feed, Litter, Milk Can, etc. 21
Garment, see Garment — Carrier Equipment 16

CARRIERS—Cont.
Hay 21
Transparent 21

CARRIERS OR SUPPORTS
Lavatory or Urinal 27

CARRYING SYSTEMS
Overhead, see Conveyors—Overhead Carrier 21

CARS
Dumbwaiter 22
Elevator 22
Movable Stage Band 21

CARTONS
Shipping 21

CARVING
Tables, see Kitchen Equipment 28

CASEMENT
Adjusters, see Hardware—Casement Window—Adjusters and/or Stays. 16
Fasteners, see Bolts—Casement—Window or Door 16
Fixtures, see Hardware—Casement Window 16
Hardware, see Hardware—Casement Window 16
Weatherstrips, see Weatherstrips—Metal 16
Windows, see Windows—Casement. 15

CASES
Book—Rolling 21
Card Catalog 21
Display 21
Display—Refrigerated, see Refrigerating—Machinery and Equipment.. 28
Instrument, see Furnishings and Equipment—Laboratory 21
Laboratory — Metal, see Cabinets—Metal—Storage 21
Museum or Treasure Room 21
Shipping 21

CASH
Drawers—Counter—Anti-hold-up .. 21

CASINGS
Door—Metal 9
Door—Wood 8
Hollow Metal, see Mouldings—Hollow Metal 11
Shower Bath 27
Underground Pipe, see Insulation—High Temperature — Underground Pipe 10
Window—Metal 9
Window—Phenolic Fiber 11
Window—Wood 8

CASTINGS
Aluminum 13
Brass or Bronze 13
Chrome Nickel Iron Alloy 13
Corrosion and Rust Resistant, see Castings—Chrome, Nickel, Iron Alloy; Castings Steel—Stainless, etc. 13
Iron 13
Iron—Architectural 13
Iron—Special 13
Machinery 13
Marine, see Castings—Iron, Special.. 13
Monel, see Castings—Nickel Copper Alloy 13
Municipal 13
Nickel 13
Nickel Copper Alloys 13
Stadium Seat 13
Stainless Steel 13
Steel and Steel Alloy 13

CATCHBASINS
Blow-off, Gravel and Drainage, see Catchbasins—Unit 27
Covers and Gratings for 13
Grease 27
Unit 27

INDEX TO SECTIONS

CAULKING
- **Compounds** 5
- **Guns,** see Guns—Caulking 1
- **Lead Cap for** 5
- **Pipe and Joints** 5

CEILING
- **Light Sash,** see
  - —Sky Lights 7
  - —Sash 15
- **Plaster, Wood or Fiber Board,** see
  - —Wallboard—Fiber 10
  - —Wallboard—Gypsum 9
  - —Plywood 8

CEILINGS
- **Acoustical,** see Acoustical—Materials and Treatments 10
- **Metal Sheet or Tile Form** 9
- **Plaster Board and Metal Furring Systems,** see Ceilings—Suspended Systems 9
- **Reinforced Concrete,** see Floor Construction 3
- **Suspended—Clips for,** see Clips—Metal Lath 9
- **Suspended—Concrete Inserts for,** see Inserts—Concrete 3
- **Suspended Systems** 9
- **Vaulted** 3

CELLAR
- **Bottle Racks,** see Bottle Racks 28
- **Drainers,** see Ejectors—Hydraulic or Electric—Automatic—Cellar Draining; Pumps—Bilge 27

CELLS
- **Prison,** see Jail—Construction and Equipment 21

CEMENT
- **Accelerators,** see Accelerators 5
- **Acidproof—for Tanks, Sewers, Drains, Fume Ducts, etc.** 4
- **Acoustical** 10
- **Asbestos,** see Insulation—High Temperature Cement 10
- **Bituminous** 5
- **Boiler,** see Refractory 10
- **Caulking,** see Caulking Compounds 5
- **Colors**—see Colors—Mortar, Cement and Stucco 5
- **Elastic,** see Waterproofing—Integral; Caulking Compounds; Cement—Pointing 5
- **Expansion Joint,** see Joints—Expansion—Concrete—Cement for 5
- **Fire Brick,** see Refractory 10
- **Floor Coatings,** see Paint—Brick, Cement, Concrete, Stucco—Stone—Preservative Finishing Coats 17
- **Floor Curing and Protection,** see Flooring—Cement and Terrazzo—Curing and Protection 17
- **Floors—Dividing Strips for,** see Dividers—Cove Base; Strips—Metal—Terrazzo Floor, Composition, Marble, etc. 11
- **For Application of Insulation** 10
- **Glazing,** see Glazing—Compounds 18
- **Gypsum,** see Plaster—Gypsum; Plaster—Keene's Cement 9
- **Hardeners,** see Hardeners and Densifiers—Cement and Concrete 5
- **Insulating,** see Insulation—High Temperature—Cement Form 10
- **Keene's,** see Plaster—Keene's Cement 9
- **Masonry** 4
- **Masonry—Colored,** see Cement Portland—Colored 4
- **Masonry—Non-staining,** see Cement Non-staining 4
- **Masonry—Waterproofed,** see Cement Portland—Waterproofed 4
  - —Waterproofing—Integral 5
- **Mastic—for Applying or Laying Wood Fiber, Tile and Plank Flooring or Units** 11

CEMENT—Cont.
- **Moth Repellant** 9
- **Non-staining** 4
- **Paint,** see Paint—Brick, Cement, Concrete, Stucco, Stone Preservative Finishing Coats; Paint—Portland Cement 17
- **Plaster,** see
  - —Cement—Portland 4
  - —Plaster—Gypsum—Prepared or Finishing 9
- **Pointing** 5
- **Portland** 4
- **Portland—Colored** 4
- **Portland—High Early Strength** 4
- **Portland—Liquid,** see Paint—Portland Cement 17
- **Portland—Waterproofed** 4
- **Portland—White** 4
- **Refractory,** see Refractory—Brick, Clay, Cement 10
- **Roof Tile,** see Tile Form—Roofing—Reinforced Cement 6
- **Roofing** 6
- **Slater's,** see Cement—Roofing 6
- **Testing,** see Inspection and Testing—Structural Materials; Efficiency, etc. 1
- **Waterproofing,** see Waterproofing—Integral 5

CENTERS
- **Sash and Transom,** see Pivots—Sash or Door 16

CESSPOOLS
- **Bell Trap,** see Drains—Floor, Yard, etc. 27
- **With Seepage Pan,** see Drains—Floors, Yard, etc. 27

CHAIN
- **Bead** 16
- **Cable** 16
- **Flat Steel** 16
- **Flat Steel and Steel Wire** 16
- **Hooks, Fasteners, etc** 16
- **Picture,** see Art Gallery Fittings 21
- **Sash** 16

CHAIRS
- **Bar—Concrete Reinforcement,** see Clips—Bar Concrete Reinforcing 3
- **Drafting Room** 21
- **Lavatory Bracket,** see Lavatory—Brackets or Chairs 27
- **Library,** see Furnishings and Equipment—Bank, Office and Library 21
- **Life Guard,** see Swimming Pool—Equipment—Springboards, Ladders, Safety Equipment, etc. 21
- **Metal** 21
- **Pipe,** see Pipe—Supports 26
- **School and College** 21
- **Theater, Assembly Hall, etc.** 21
- **Wood,** see Furniture—Wood 21

CHALK
- **Troughs or Rails,** see Blackboard—Trough Insert 21

CHALKBOARDS
- **Composition** 21
- **Glass** 21

CHANCELS
- **Church,** see Ecclesiastical Furniture and Accessories 21

CHANNELS
- **Furring, Studding, etc.,** see Furring and Studding—Metal 9
- **Steel Stair Stringers,** see Stairs—Iron or Steel—Channel Stringers for 12
- **Structural,** see Structural—Shapes—Angles, Channels, I-Beams, Bars, Trusses, etc. 3

CHAPLETS
- **Foundry** 1

CHECK ROOM EQUIPMENT
- **Hotel Club, etc.** 21

CHECKS AND CLOSERS
- **Door—Concealed—Overhead, in Door, or in Floor** 16
- **Door—Surface** 16

CHEMICAL
- **Stoneware** 27
- **Toilets** 27

CHEMICAL PLANT
- **Equipment** 3

CHESTS
- **Burglar-Proof,** see Safes—Fire-resistive—Portable, Wall, etc. 21

CHIMES
- **Door or Signal** 25
- **Tower** 21
- **Tower Clocks** 21
- **Tuning Devices for** 21

CHIMNEY
- **Caps and Pots—Clay or Terra Cotta** 4

CHIMNEYS
- **Acidproof** 26
- **Cast Iron—Adjustable** 26
- **Common Brick** 26
- **Condensation Eliminator** 26
- **Demolition** 26
- **Linings for** 26
- **Ornaments** 26
- **Radial Brick** 26
- **Reinforced Concrete** 26
- **Repairing and Remodeling** 26
- **Steel** 26

CHLORINE
- **Control Apparatus** 21

CHROME
- **Nickel Iron Alloys,** see Metals—Chrome Nickel Iron Alloys 13

CHUTES
- **Coal—Basement or Cellar** 13
- **Fire Escapes,** see Fire—Escapes—Tubular 12
- **Garbage or Waste** 28
- **Gravity** 21
- **Ice Recording,** see Doors—Cold Storage or Refrigerator 28
- **Laundry** 28
- **Laundry Door** 28
- **Letter or Mail** 21
- **Linings for Laundry, Garbage, etc.** 11
- **Package Spiral** 28

CIRCUIT
- **Breakers** 23

CIRCULATORS
- **Heating Systems—Hot Water and Domestic Hot Water Supply,** see Heating Systems—Hot Water Circulator for 26

CISTERNS 27

CLAMPS
- **Beams, Joist, Wall, etc.** 3
- **Cable and Conduit** 23
- **I-Beam—Pipe Hanger** 26
- **Pipe** 26
- **Reflector** 24

CLEANERS, POLISHERS AND PRESERVATIVES
- **Tile, Marble, Linoleum, Brick, Wood, etc.** 17
- **Vacuum,** see Vacuum Cleaners 28
- **Vacuum—Swimming Pool,** see Swimming Pool—Cleaning Tools 21

CLEANING
- **Building Exteriors** 1

CLIPS
- **Anchor—Acoustical Ceiling** 3
- **Bar—Concrete Reinforcing** 3

CLIPS—Cont.
Beam Reinforcement . . . 3
Floor Sleeper . . . 3
Metal Lath—Ceilings, Stucco Reinforcement, Casing, etc. . . . 9
Soffit, see Caging—Wire—Beam and Girder . . . 3
Wire Rope, see Rope—Wire—Fittings for . . . 22

CLOCK SYSTEMS
Electric—Secondary . . . 25
Watchman's . . . 25

CLOCKS
Bank—Pedestal, Bracket, etc . . . 25
Electric . . . 25
Program, see Clock Systems; Clocks—Regulator or Master . . . 25
Regulator or Master . . . 25
Sidewalk—Post and Bracket, see Clocks—Bank, etc . . . 25
Time, see Recorders—Time—Watchman's . . . 25
Tower . . . 25

CLOSERS
Door—Elevator, see Operators—Door Elevator . . . 22
Door—Refrigerator . . . 16
Door—Sliding or Swinging, see Checks and Closers—Door; Operators—Door—Sliding, Swinging, etc. . . . 16

CLOSET
Flush Valves, see Valves—Flush—Closet or Urinal . . . 27
Garment Carriers, see Garment—Carrier Equipment . . . 16
Lining—Cedar . . . 11
Lining—Plastic . . . 9
Partitions, see Partitions—Toilet, Shower, Dressing Room or Urinal . . . 20
Racks and Equipment . . . 16
Seat Hinges, see Hinges—Closet Seat; Hinges—Lavatory and Toilet Door . . . 16
Seats . . . 27

CLOSETS
Broom, see Cabinets—Broom . . . 28
Chemical . . . 27
China, see Cabinets—China . . . 28
Onepiece . . . 27
Septic Tank . . . 27
Telephone, see Cabinets—Telephone . . . 21
Warming—Blanket, Bedpan, etc., see Cabinets—Hospital—Instrument, Warming, Bedpan, etc . . . 21
Warming—Plate, see Plate—Warmers . . . 28
Water—Bends and Fittings for . . . 27
Water—Connections for . . . 27
Water—Flush Tank Combination . . . 27
Water—Flush Valve . . . 27
Water—Low-down Tank . . . 27

CLOTH
Condensation Retardant . . . 11
Lining, see Covering—Wall—Woven . . . 11
Wall Coverings, see Coverings—Wall Woven . . . 11
Window Shade, see Shades—Window Cloth of Fabric for . . . 16
Wire, see Screen Cloth . . . 16

CLOTHES
Chutes, see Chutes—Laundry . . . 28
Dryers, see Dryers—Clothes . . . 28
Hangers, see Hangers—Garment . . . 16
Lines, see Cord . . . 16
Presses, see Ironing Machines . . . 28

CLUTCHES
Friction . . . 26

COAGULATORS . . . 27

COAL
Burning Equipment, see Stokers . . . 26
Chutes—Window, see Chutes—Coal—Basement or Cellar . . . 13
Hole Covers, see Covers and Frames—Manhole . . . 13

COAL OR COKE
Stokers, see Stokers . . . 26

COAT
Racks, see Racks—Hat and Coat . . . 21

COATERS AND SEALERS
See Fillers; Paint; Sizing, etc . . . 17

COATINGS
Roof, see
—Asphalt—Basic; Roofing—Built-up . . . 6
—Paint—Roof and Barn, etc . . . 17

COCKS AND BIBBS
See Faucets . . . 27

COFFEE
Urns, see Urns—Coffee, Tea or Milk . . . 28

COILS OR CORES
Fin Type—Heat Transfer or Cooling . . . 26

COILS
Pipe . . . 28

COLD
Storage—Fur Fixtures, see Fur—Fixtures—Cold Storage . . . 28
Storage—Insulation, see Insulation—Cold Storage or Refrigeration . . . 10
Storage—Mortuary Racks, see Mortuary—Racks . . . 28
Storage—Shelving, see Refrigerators—Shelving . . . 28
Water Paint, see Paint—Water . . . 17

COLLECTION EQUIPMENT
Admission, Fares, etc., see Turnstiles . . . 21

COLORS
Mortar—Cement, Stucco Plaster, etc. . . . 5
Water . . . 17

COLUMNS
Coverings for, see
—Lath Metal; Wall Board . . . 9
—Tile—Hollow—Clay or Terra Cotta—Partition, Furring, Beam and Column Covering, etc.; Tile Form—Hollow—Gypsum Partition, Furring, Beam and Column Covering, etc . . . 4
—Wallboard . . . 11
Granite . . . 4
Metal—Porch, Pergola, etc. . . . 8
Moulds or Forms, see Forms—Metal . . . 3
Ornamental Metal, see Ornamental—Metal Work . . . 13
Steel . . . 3
Steel—Concrete Filled . . . 3
Wood—Lock Joint . . . 8
Wood—Porch, Pergola, etc. . . . 8

COMPENSATORS
Electric, see Switches—Electric—Motor Starting . . . 23

COMPOSITION
Floors—Dividing Strips for, see Strips—Metal—Terrazzo Floor Composition, Marble, Linoleum, Rubber, Asphalt, Tile, etc . . . 11
Stone, see Stone—Cast—Interior and/or Exterior . . . 4

COMPRESSORS
Air, Gas or Steam . . . 26
Ammonia, CO_2, Freon-12 and/or Methyl Chloride . . . 28
Booster, see Compressors—Air, Gas or Steam . . . 26
Turbine, see Blowers—Pressure or Volume; Blowers—Turbo; Compressors—Air or Gas . . . 26

CONCEALED
Beds, see Beds—Closet—Portable; Beds—Disappearing or Built-in . . . 21

CONCRETE
Accelerators, see Accelerators . . . 5
Admixtures, see Specific Type as: Hardeners and Densifiers; Waterproofing, Anti-Freeze; Fillers—Concrete . . . 5
Aggregates—Lightweight, see Aggregates—Concrete—Lightweight . . . 4
Anchor Floor Sleeper, see Clips—Floor Sleeper . . . 3
Antifreeze Compounds, see Antifreeze Compounds . . . 5
Architectural . . . 4
Armored . . . 13
Ashlar Masonry . . . 4
Blocks, see Concrete—Light Weight . . . 3
Blocks—Metal Covered, see Blocks—Lightweight Concrete—Metal or Porcelain Faced . . . 4
Concrete—Cast Stone Interior and/or Exterior, see Stone—Cast Interior and/or Exterior . . . 4
Curing, see Flooring—Cement and Terrazzo—Curing and Protection . . . 17
Filler Tile . . . 3
Floor Construction, see Floor Construction . . . 3
Floor Sleeper Clips, see Clips—Floor Sleeper . . . 3
Forms, see Forms . . . 3
Hardeners, see Hardeners and Densifiers—Cement and Concrete . . . 5
Inserts, see Inserts—Concrete . . . 3
Joists, see Joists—Precast; Joists—Reinforced—Concrete . . . 3
Lightweight . . . 3
Lightweight—Glass Covered . . . 4
Mass Construction, see Contractors—Concrete—Construction . . . 2
Nailing Base, see Nailing Concrete; Tile—Hollow or Solid—Cinder concrete . . . 3
Portland Cement, see Cement—Portland . . . 4
Reinforced Joists, see Joists . . . 3
Reinforcement—Bars and Rods, see Bars—Concrete Reinforcing . . . 3
Reinforcement—Beam Wrappers, see Caging—Wire, Beam, Girder or Column . . . 3
Reinforcement—Continuous Wire Mesh for Beams and Girders, see Caging—Wire, Beam, Girder or Column . . . 3
Reinforcement—Expanded and/or Perforated Sheet, see Lath—Expanded or Perforated Metal Sheet . . . 9
Reinforcement—Floor Forms or Tiles, see Forms—Metal . . . 3
Reinforcement—Testing of, see Inspection and Testing—Structural Materials, Equipment, Efficiency, etc . . . 1
Reinforcement—Vault Construction . . . 21
Reinforcement—Wire Mesh . . . 3
Reinforcement—Wire Mesh—Paper Combination . . . 3
Reinforcing Devices, see Clips—Bar—Concrete Reinforcing . . . 3
Restoration . . . 1
Waterproofing, see Waterproofing—Integral . . . 5

CONDENSATION
Pumps and Receivers, see Pumps and Receivers—Condensation . . . 26

CONDENSERS
Ammonia and Refrigerating, see Refrigerating—Machinery and Equipment; Ice Making—Machinery and Plants . . . 28
Evaporative . . . 26
Shell and Tube, see Refrigerating Machinery and Equipment . . . 28
Steam . . . 26
Unit—Air Conditioning . . . 26

CONDUCTORS
Electric, see Wire and Cables—Electric 23
Leader Pipe—Cast Lead and/or Lead Coated Copper 6
Leader Pipe—Copper 6
Leader Pipe—Iron 6
Leader Pipe—Shoes—For Protection, see Shoes—Leader 6
Leader Pipe—Steel 6
Lightning, see Lightning Rods 23
Lightning Poles, see Lightning—Poles 13
Lightning—Installing and Repairing, see Lightning—Rods—Installing and Repairing 23
Pipe—Fasteners and Fittings for 6

CONDUIT
Air Conditioning, see Ducts—Sheet Metal—Heating, Ventilating and/or Air Conditioning 26
Electrical—Bending Tools for 23
Electrical—Busbar Systems 23
Electrical—Combined with Base 23
Electrical—Fittings for 23
Electrical—Flexible—Metallic 23
Electrical—Flexible—Non-metallic .. 23
Electrical—Metal Moulding or Raceway 23
Electrical—Rigid 23
Electrical—Surface Raceway, see Conduit—Electrical—Metal Moulding or Raceway 23
Electrical—Underfloor 23
Electrical—Vitrified Clay 23
Hangers and Straps, see Hangers—Conduit and Cable 23
Telephone—Planning for, see Telephone—Service—Public 25
Telephone Raceway and/or Outlets—Overfloor 25
Tin or Terne Plate 6
Underground Pipe Insulation, see Insulation—High Temperature 10
Wall Base—Combination, see Conduit—Electrical—Combined with Base. 23

CONNECTIONS
Roof—Leader and Vent, see Vent Connections—Roof 6

CONNECTORS
Electric 23

CONSERVATORIES
Glass, see Greenhouses and Conservatories 21

CONSOLE
Lifts, see Elevators—Theater—Orchestra, Organ, Console, Stage, etc. 22

CONTRACTORS
Acoustical, see Acoustical—Materials and Treatments 10
Armored Concrete 13
Cells-Prison, see Jail—Construction and Equipment 21
Chimney, see Chimneys 26
Cold Storage Insulation 10
Concrete Construction 2
Floor Construction 3
Flooring, see Specific Type of Flooring 11
Foundation, see Engineers—Foundation; Contractors—Piling 2
Greenhouse and Conservatory, see Greenhouses and Conservatories ... 21
Hollow Tile Fireproofing 3
Industrial Plant 1
Insulation, see Insulation; Insulation Reflective—Metal Foil 10
Jail Construction, see Jail—Construction and Equipment 21
Lightning Rod 23
Piling 2
Prison Construction, see Jail—Construction and Equipment 21
Roof Construction 6
Roof Truss 3
Sewage Disposal, see Sewage—Disposal Systems 27
Shoring, see Engineers 2

CONTRACTORS—Cont.
Skylights—Glass, Concrete and/or Steel Construction 7
Steam Power Plant 26
Swimming Pool, see Engineers—Swimming Pool 21
Terrazzo, see Terrazzo—Flooring—Contractors for 11
Theater Planning 21
Vault, see Vaults 21
Vaulted Arch 3
Waterproofing and Dampproofing, see Engineers—Waterproofing and Dampproofing; Waterproofing—Contractors 5
Wood Flooring 11

CONTROLLERS
Air Conditioning, see Controls—Air Conditioning 26
Boiler Temperature or Pressure, see Regulators—Damper 26
Chlorine, see Chlorine—Control Apparatus; Hypochlorite—Control Apparatus 21
Compensating Temperature, Air Conditioning, see Controllers—Temperature—Weather Compensating. 26
Cooling—Air Conditioning 26
Damper, see Dampers or Registers ... 26
Dumbwaiter, see Dumbwaiters—Electric 22
Elevator, see Elevators—Electric 22
Elevator Door, see Elevators—Electric 22
Furnace Temperature, see Regulators—Damper 26
Humidity 26
Humidity and Temperature—Combined 26
Low Water, see Boiler—Low Water Protector 26
Motor—Automatic and Manual 23
Pressure—Automatic 26
Recording 26
Refrigeration 28
Stoker 26
Temperature 26
Temperature—Radiator Valve, see Valves—Radiator Supply 26
Temperature—Thermostatic Relays for, see Relays—Electric 23
Temperature—Water Mixing, see Valves—Mixing or Tempering—Thermostatic 26
Mixers—Shower Bath 27
Temperature—Weather Compensating 26
Unit Ventilator, see Controls—Air Conditioning 26
Valve 26
Water Level, see Controls—Water Level 26

CONTROLS
Air Conditioning 26
Automatic—Lighting 23
Central and Individual Hot Water and/or Steam Heating Systems ... 26
Compressor—Refrigeration, see Refrigerating—Machinery and Equipment 28
Door Operator—Elevator, see Operators—Door Elevator 22
Door Operators—Sliding, Swinging, Folding, Rolling, etc., see Operators—Door—Sliding, Swinging, Folding, Rolling, etc. 16
Ventilator Damper and Fan Motor ... 7
Water Level 26

CONVECTOR TYPE
Radiator, see Radiators—Convector Type 26

CONVENIENCE
Outlet, see Receptacles—Electric—Convenience Outlets 23

CONVERTERS
Heat, see
—Heat—Exchangers, Interchangers, Economizers, etc. 26
—Heaters—Water—Indirect 27
Synchronous or Rotary 23

CONVEYORS
Apron 21
Belt 21
Book 21
Drag Chain or Scraper 21
Dumbwaiter, see Dumbwaiters 22
Food—Portable 28
Gravity Chutes, see Chutes—Gravity—Straight or Spiral 21
Gravity Roller 21
Live Roller 21
Overhead Carrier 21
Pneumatic Tube, see Pneumatic Dispatch Tube Systems 21
Portable 21
Power, see Specific Type 21
Skip 21
Slat 21
Tray 21
Wheel—Gravity 21

COOKERS
Starch 28

COOKING
Utensils 28

COOLERS
Beer, Milk, Beverage, etc. 28
Brine, see Refrigerating—Machinery and Equipment; Ice Making—Machinery and Plants 28
Drinking Water 27
Mortuary, see Refrigerators—Mortuary 28
Room, see Coolers—Unit 26
Unit—Cooling Element with Fan or Blower 26
Unit—Cooling Element with Fan or Blower, Moistener, Humidifier and/or Dehumidifier 26
Unit and Heater Combination 26

COOLING
Towers, see Towers—Cooling Atmospheric, Forced Draft or Spray Nozzles 3

COPINGS
Wall—Clay or Terra Cotta 4
Wall—Metal Covered 4
(See also Extruded or Drawn Metal Shapes) 13
Wall—Stone 4

COPPER
Extruded, see Extruded or Drawn—Metal Shapes 13
Rods, see Rods and Bars—Copper ... 13
Roofing, see Roofing—Copper 6
Sheet Metal, see Sheet Metal—Brass, Bronze, Copper or Nickel Silver ... 13

CORD
Electric, see Wire and Cables—Electric 23
Sash—Cotton 16
Sash—Cotton—Wire Center 16
Sets—Range Receptacles 23

CORES OR COILS
Heating and/or Cooling, see Coil or Cores—Fin Type—Heat Transfer or Cooling 26

CORK
Board, see Insulation—House; Wall Board 10
Brick, see Insulation—House 10
Bulletin Boards, see Bulletin—Boards 21
Carpet 11
Expansion Joints, see Joints—Expansion—Premoulded 3
Flooring, see Flooring—Cork Tile Form; Flooring—Cork Composition 11
Foundations for Vibration Isolation, see Isolation—Machinery Vibration 10

CORK—Cont.
Granulated and Regranulated, see Insulation—House—Powdered, Granular or Shredded 10
Insulation, see Insulation—Cold Storage or Refrigeration 10
Pipe Coverings, see Insulation—Cold Storage or Refrigeration 10
Wainscoting, see Flooring—Cork Tile Form 11
Wall Coverings, see Coverings—Wall Cork or Cork Composition 11

CORNER
Beads—Metal, see Beads—Corner—Metal 9
Curb Reinforcement 13
Reinforcement—Metal, see Beads—Corner—Metal; Lath—Interior Corner Reinforcement—Metal 9

CORNERS
Exterior Wainscoting, see
—Cove—Base—Metal 9
—Cove Base—Tile 11
Inside and Outside, see
—Cove Base—Metal 9
—Cove Base—Tile 11

CORNICES
Cast Iron, see Castings—Iron—Architectural 13
Hollow Metal, see Mouldings—Hollow Metal 11
Ornamental Metal, see Ornamental—Metal Work 13
Porcelain Enameled, see Sheet Metal Vitreous Porcelain Enameled 13
Sheet Metal 6
Wood 8

CORRUGATED
Sheet Metal—Asbestos Covered, see Sheet Metal—Steel—Asbestos Covered 6

COUNTER
Tops, see Tops—Sink; Cabinet—Tops 28

COUNTERS
Bank and Office 21
Cafeteria and Restaurant—Lunch ... 11
Hospital, see Furnishings and Equipment—Hospital 21
Porcelain Enameled 13
Revolution or Operation 21

COUPLINGS
Pipe, see Fittings—Pipe 27

COVE BASE
Art Marble, see Flooring—Art Marble 11
Asphalt, see Flooring—Asphalt Mastic; Flooring—Asphalt—Tile Form 11
Binding Bars, see Dividers—Floor and Cove Base 9
Bluestone, see Treads—Bluestone; Flooring—Bluestone 11
Cork, see Flooring—Cork Tile Form 11
Fiber, see Wallboard—Fiber 10
Dividers, see Dividers—Cove Base ... 11
Metal and/or Covered Metal 9
Rubber, see Flooring—Rubber Sheet or Tile Form 11
Slate, see Slate—Structural 11
Soapstone 4
Terrazzo, see Terrazzo—Precast 11
Tile 11

COVERINGS
Beam, Girder and Column, see
—Tile—Hollow—Clay or Terra Cotta; Tile Form—Hollow Gypsum; Tile Form—Hollow or Solid—Cinder Concrete 4
—Lath—Expanded and Perforated Metal Sheet 9
Boiler Settings—Felt, see Insulation—High Temperature 10
Decorative and Protective for Screw Heads, etc. 16

COVERINGS—Cont.
Door—Leather, see Door—Coverings Leather for 21
Pipe and Boiler, see Specific Kind of Insulation—High Temperature 10
Underground Pipe Insulation—Steam, Water, etc., see Insulation—High Temperature 10
Wall, Ceiling and/or Air Ducts—Acoustical, see Acoustical Materials and Treatments 10
Wallboard—Asbestos—Cement, see Wallboard—Asbestos—Cement .. 9
Wall—Artificial Leather 21
Wall—Ashlar, see Specific Type of Stone 4
Wall—Cloth Backed Wood Veneer .. 11
Wall—Cork or Cork Composition ... 11
Wall—Fiber Board, see Wallboard—Fiber 10
Wall—Linoleum 11
Wall—Metal 11
Wall—Metal Trim for, see Trim—Metal—for Wall Panels of Linoleum, Bakelite, Glass, Plywood, etc. 11
Wall—Paper 11
Wall—Plywood, see Plywood; Wallboard—Plywood 8
Wall—Rubber Sheet or Tile Form .. 11
Wall—Sheet Form, see Panels; Wall—Board, etc. 11
Wall—Tile Form, see Specific Type; such as: Coverings—Wall Cork; Coverings—Wall—Rubber 11
Wall—Wood Veneer, see
—Wallboard—Wood Grain Finish 11
—Panels—Veneered—Wood; —Veneers—Wood 8
Wall—Woven 11

COVERS
Cast Iron—Terrazzo Fill 13
Drain 13
Glass—Swimming Pool 21
Radiator, see Radiator—Covers and Cabinets 26
Water Meter 13

COVERS AND FRAMES
Drainage—Roadway 13
Manhole, Trench, Gutter, etc. 13
Safety—Blow-off 13
Sidewalks, Area, etc. 13

COVERS AND RINGS
Coalhole, see Covers and Frames—Manhole, Trench, Gutter, etc. 13
Lamphole 13
Valve 13

CRANES—MONORAIL
See Conveyors—Overhead Carrier ... 21

CRAYON
Blackboard 21
Troughs—Blackboard, see Blackboard Trough Insert 21

CREMATORIES
Cemetery, Morgue, Laboratory, etc... 28

CREOSOTE
Oil, see Preservatives—Wood 8

CRESTINGS
Decorative, see
—Terra Cotta 4
—Ornamental—Metal Work 13
—Leadwork—Decorative 18

CROP—STORAGE UNITS
Chopped Hay, Straw, Stover, Ensilage and Grain 21

CROWBARS
Firefighting, see Fire—Extinguishing Apparatus 21

CUBICLES
Curtain Screening for, see Curtains—Screening—Bedside, Cubicle, Hospital, etc. 20
Hospital, see Screens—Hospital Ward 20

CUPBOARDS
Metal or Wood, see Cabinets 28

CUPOLAS 21

CURB
Inlet, see Catchbasins—Covers and Gratings for 13

CURBS
Steel and Iron 13
Steel Ventilator, see Ventilators—Curb 7

CURING
For Floors, see Flooring—Cement and Terrazzo—Curing and Protection. 17

CURTAINS
Asbestos, see Curtains—Theater Stage 21
Ceiling, Roof, Stage, etc.—Motor Operated 14
Folding Partition, see Partitions—Folding 20
Hooks for 20
Lightproof, see Shades—Lightproof .. 16
Screening—Bedside, Cubicle, Hospital, etc. 20
Steel—Sound Insulated 21
Theater Stage 21
Theater Stage—Automatic Controls or Operators for 21
Theater Stage—Hangers and Track for 21

CUT
Stone, see Specific Type of Stone, as: Bluestone, Granite, Marble, etc. 4

CUTTING
Apparatus—Acetylene, Oxygen, etc., see Welding—Accessories and Supplies 1
Machines—Tile 1

CYLINDERS
Creosoting 3
Deep Well, see Pumps—Deep Well—Plunger 27
Glass 24

D

DAMPER
Registers, see Dampers or Registers .. 26

DAMPERS
By-pass 26
Exhaust—Ventilator, etc., see Dampers or Registers 26
Fireplace 26
Motors, see Motors—Electric Damper Regulator 26
Regulators for, see Regulators—Damper 26
Temperature Controlled—Automatic . 26
Ventilator 7

DAMPERS OR REGISTERS—HEATING, VENTILATING OR AIR CONDITIONING
Controlled Intakes or Outlets 26

DAMPPROOFING
Coatings—Paints and Compounds ... 5

DAYLIGHT
Roof Construction, see Skylights—Glass, Concrete and/or Steel Construction 7

DECALORATORS, see
—Coolers—Unit 26
—Refrigerating Machinery and Equipment 28

DECK
Paint, see Paint—House—Ready Mixed 17

DECKS
Floor, see Floor Construction..... 3
Roof, see Roof Construction..... 3

DEFLECTORS
Air, see
—Dampers or Registers; Louvers.. 26
—Ventilators 7
Light 24

DEHUMIDIFIERS
Air 26

DEHYDRATING
Tubes 26

DENSIFIERS
Cement and Concrete, see Hardeners and Densifiers—Cement and Concrete 5

DEODORANTS
See Cleaners, Polishers and Preservatives 17

DEODORIZATION
Apparatus, see Chlorine—Control Apparatus; Hypochlorite — Control Apparatus 21

DEPOSITORIES
Bank—Night or After Hours, see Safes—Night Depository 21

DERRICKS 1

DESKS
Check and Lobby..... 13
Kitchen—Planning, see Cabinets—Kitchen 28
Laboratory, see Laboratory—Apparatus and Equipment
Library, see Furnishings and Equipment—Bank, Office and Library.. 21
Metal 21
Phenolic Fiber 21
School and College..... 21
Wood, see Furniture—Wood..... 21

DETECTORS
Sound—Bank Vault 21

DICTAPHONES, see Telephone—Inter or Intra-Communicating Systems.. 25

DIFFUSERS
Air, see
—Dampers or Registers; Louvers.. 26
—Ventilators 7
Light 24
High Velocity Air..... 26

DIMMERS
Electric, see Rheostats—Electric.... 23

DIRECTORIES
Building 21
Building—Frames for, see
—Directories—Building 21
—Ornamental—Metal Work 13
Club, Hotel, Hospital, etc.—In-and-Out Indicating 25
Metal, see Directories—Building.... 21

DISAPPEARING
Stairways, see Stairs—Disappearing.. 12

DISINFECTANTS, see Cleaners, Polishers and Preservatives 17

DISHWASHING MACHINES
Electric 28

DISPENSERS
Soap, see Soap—Dispensers 27
Towel or Napkin, etc., see Bathroom Accessories — Holders — Paper Towel or Napkin 27

DISPLAY
Cases — Refrigerated, see Refrig-... erators—Electric 28
Equipment—Mechanical 21
Racks or Rails—Blackboard..... 21

DISPOSAL SYSTEMS
Sewage, see Sewage—Disposal Systems 27

DISTRIBUTION
Conditioned Air, see Specific Type of Product 26

DIVIDERS
Color Strip 11
Cove Base 11

DIVING
Boards—Automatic Adjustable..... 21

DOME CONSTRUCTION
Vaulted 3

DOMESTIC SCIENCE
Equipment, see Specific Product as Sinks, Cabinets, etc..... 21

DOOR
Automatic Sliding Pole..... 21
Bottoms—Automatic 16
Bottoms—Weatherstrip 16
Casings—Metal—Flush, see Mouldings—Hollow Metal; Mouldings—Metal Covered 11
Closers and Checks, see Checks and Closers—Door 16
Guards, see Grilles and Guards—Door, Floor and Window..... 20
Hardware, see Hardware—Door..... 16
Interlocks—Elevator, see Interlocks —Elevator or Dumbwaiter Door.. 22
Operators, see
—Operators — Door — Sliding, Swinging, Folding, Rolling, etc.. 16
—Operators—Door Elevator..... 22
Panels—Ventilating, see Louvers—Door Ventilating 16
Pulls 16
Saddles, see
—Flooring—Rubber 11
—Threshold and Saddles—Metal. 19
Screens, see Screens—Insect..... 16
Stops, see Stops—Door..... 16

DOORS
Access 27
Accordion, see Doors—Horizontal Sliding, Folding, Telescoping or Trolley 14
Airplane Hangar or Crane..... 14
Airplane Hangar—Hardware for, see Hardware—Airplane and Dirigible Hangar Door 16
Ash Pit, Trap or Clean-out..... 26
Automatic Operators, see
— Operators — Door — Sliding, Swinging, Folding, Rolling, etc.. 16
—Operators—Door—Elevators ... 22
Balanced 14
Bifolding and Canopy, see Doors—Horizontal Sliding—Folding, Telescoping or Trolley; Doors—Vertical Sliding—Folding or Telescoping.. 14
Cabinet 14
Canopy, see Doors—Airplane Hangar. 14
Casement 15
Cell, see Jail—Construction and Equipment 21
Clothes or Laundry Chute, see Chutes Laundry Door 28
Coal—Basement or Cellar, see Chutes —Coal—Basement or Cellar..... 13
Cold Storage or Refrigerator..... 28
Collapsible Folding, see Gates—Folding—Lazy Tong and Bostwick.... 20
Combination—Screen and Storm, see Screens—Insect 16
Co-ordinating Devices for Double Doors 16
Corrugated Metal—Sliding, Swinging, Folding, Rolling, etc...... 14
Crane Entrance, see Doors—Airplane, Hanger or Crane 14
Driveway Entrance, see Doors—Entrance; Doors — Mechanically or Motor Operated; Doors—Sliding, Folding, etc.; Doors—Folding Horizontal 14
Dumbwaiter, see Dumbwaiter—Doors 14

DOORS—Cont.
Electrically Operated, see Doors—Mechanically or Motor Operated..... 14
Elevator—Counterbalanced 14
Elevator—Passenger, see Enclosures—Elevator; Doors—Hollow Metal; Doors—Metal Covered; Doors—Veneered—Fireproof 14
Elevator—Telescoping—Vertical or Horizontal Sliding 14
Entrance—Metal—Commercial Buildings, Stores, etc...... 14
Entrance—Motor Operated, see Doors —Entrance; Doors—Mechanically or Motor Operated 14
Extruded Metal, see Doors—Hollow Metal 14
Fire, see Specific Type of Door..... 14
Fire Resisting Wood, see Doors—Veneered—Fire Resisting Asbestos and/or Wood 14
Flush, see Doors—Hollow Metal; Doors—Metal Covered; Doors—Veneered; Doors—Wood 14
Folding, see Doors—Horizontal Sliding—Folding, Telescoping or Trolley; Doors—Vertical Sliding—Folding or Telescoping 14
Folding—Fabric Covered, see Partitions—Folding—Fabric Covered.. 20
Folding—Sound Retarding, see Doors —Sound Retarding 14
Freezer, see Doors—Cold Storage or Refrigerator 28
French, see Doors—Casement..... 15
Garage, Driveway Entrance, etc...... 14
Glass—Shower Stall, see Doors—Shower Stall—Glass 27
Hangar—Airplane, see Doors—Airplane Hangar 14
Hardware for, see Hardware—Door.. 16
Hollow Metal 14
Hopper 28
Horizontal Folding, see Doors—Vertical Sliding—Folding or Telescoping; Doors—Overhead Type..... 14
Horizontal Sliding—Folding, Telescoping or Trolley 14
Industrial, see Specific Kind or Door. 14
Jail, see Jail—Construction and Equipment 21
Kalamein, see Doors—Metal Covered 14
Kitchenette, see Doors—Rolling—Metal 14
Marine, see Specific Type of Door... 14
Mausoleum 13
Mechanically or Motor Operated.... 14
Metal Covered 14
Metal—Sliding, Folding or Telescoping, see Doors—Horizontal Sliding —Folding, Telescoping or Trolley; Doors—Vertical Sliding—Folding or Telescoping 14
Operators for, see Operators..... 14
Overhead—Hardware for, see Hardware—Garage Door 16
Overhead Type 14
Paneled 14
See Specific Type, as: Doors—Hollow Metal; Doors—Metal Covered; Doors—Veneered; Doors—Wood 14
Phenolic Fiber, see Panels—Phenolic Fiber 11
Pipe Shaft or Access, see Doors—Access 27
Plywood Panels for, see Plywood.... 8
Power, see Specific Type of Door; Doors—Mechanically or Motor Operated; Operators—Door.... 14
Revolving—Automatic Panicproof... 14
Refrigerator, see Doors—Cold Storage or Refrigerator 28
Rolling Metal 14
Rolling Wood 14
Round House, see Doors—Rolling—Metal 14

DOORS—Cont.
Screen, see Screens—Insect 16
Sheet Metal—Sliding, Swinging, etc. 14
Showcase 19
Shower Stall—Glass 27
Shower Stall—Metal, see Partitions—Toilet, Shower, Dressing Room or Urinal—Metal 20
Sidewalk—Grating, see Gratings 11
Sidewalk—Metal—Residential 13
Sidewalk—Metal or Vault Light—Safety Guarded — Automatically Opened and Closed 26
Sidewalk—Opening and Closing Devices for 26
Sidewalk—Vault Light 7
Sliding, see Doors—Vertical Sliding; Doors—Horizontal Sliding 14
Sliding or Swinging—Metal Clad, see Doors—Metal Covered 14
Solid Woods, Metal, etc., see Specific Type as Doors — Wood — Solid; Doors—Sheet Metal 14
Sound Retarding 14
Stack, see Doors—Ash Pit, Trap or Cleanout 26
Steel, see Doors—Sheet Metal 14
Telescoping, see Doors—Horizontal Sliding—Folding Telescoping or Trolley; Doors—Vertical Sliding—Folding or Telescoping 14
Tin Clad, see Doors—Metal Covered . 14
Toilet—Metal 20
Toilet—Porcelain Enameled 20
Trolley, see Doors—Horizontal Sliding—Folding, Telescoping or Trolley . 14
Tubular Steel, see Doors—Hollow Metal 14
Utility, see Chutes—Coal—Basement or Cellar 13
Vault Front 21
Veneered—Fire Resisting Asbestos and/or Wood 14
Veneered—Phenolic Fiber 11
Veneered—Wood 14
Ventilator Paneled 14
Vertical Lift, see Doors—Vertical Sliding—Folding or Telescoping; Doors—Overhead Type 14
Vertical Sliding—Folding or Telescoping 14
Weatherstripping, see Weatherstrips—Metal—for Double Hung Windows, Casements, Doors, Transoms, etc. 16
Wire Mesh, see Door and Gates—Woven Wire — Partitions — Open Mesh 20
Wood—Hollow—Core 14
Wood—Metal Frame 14
Wood—Sliding, Folding or Telescoping, see Doors—Horizontal Sliding—Folding, Telescoping or Trolley; Doors—Vertical Sliding—Folding or Telescoping 14
Wood—Solid Core or Stock 14
X-Ray Protection 10

DOORS AND GATES
Woven Wire 20

DOWNSPOUTS
Metal, see Conductor—Pipe 6

DRAFTING ROOM
Accessories 21

DRAIN
Boards
—Linoleum Composition 28
—Nickel Copper Alloy 28
—Phenolic Fiber 11
—Sink, see Sinks; Tops—Sinks, etc. 28
—Stainless Steel, see Drain—Boards—Nickel Copper Alloy . . 28
—Vitreous China 28
Pipe, see Pipe—Drain 27
Pipe Packing, see Packing—Drain Pipe—Acid Resistant 27

DRAINERS
Cellar, see Ejectors—Hydraulic or Electric—Automatic—Cellar Draining; Pumps—Bilge 27

DRAINS
Areaway, see Drains—Floor, Yard, etc. 27
Automatic Seal for 27
Backwater Valve 27
Double Drainage 27
Floor, Yard, etc. 27
Floor, Yard, etc.—Acid-proof 27
Garage—Mud Arresting 27
Gutter, see Drains—Roof, Gutter or Promenade 27
Non-clog 27
Non-clog—Triple Drainage 27
Oil or Grease Separating 27
Railroad Track 27
Refrigerator 27
Roof, Gutter or Promenade 27
Scupper, see Scuppers—Metal 27
Shower or Urinal, see Drains—Floor, Yard, etc. 27
Stable Gutter, see Drains—Roof, Gutter or Promenade 27
Swimming Pool, see Swimming Pool—Drains, Strainer and Fittings 21
Trap 27
Urinal, see Drains—Floor, Yard, etc. . 27

DRAPERIES 21

DRAWER
Pulls 16
Slides 16

DRAWERS
Steel Shelving, see Shelving—Steel . . 21

DRAWING
Boards 21
Tables, see Tables—Drawing 21

DRAWN
Metal Shapes, see Extruded or Drawn—Metal Shapes 13

DREDGES 1

DRESSERS
Kitchen, see Cabinets—Kitchen 28

DRESSING
Cabinets, see Cabinets—Dressing . . . 27
Room Partitions, see Partitions—Toilet, Shower, Dressing Room or Urinal 20

DRESSINGS
Floor, see Paint; Cleaners, Polishers and Preservatives; Preservatives—Wood 17

DRILLS
Core 1
Masonry 1

DRINKING WATER
Coolers, see Coolers 27
Fountains, see Fountains—Drinking . 27
Systems, see
—Fountains—Drinking 27
— Refrigerating — Machinery and Equipment; Ice Making—Machinery and Plants; Coolers 28

DRIVERS
Pile 1

DRIVES
Motor—For Operating Doors, Bridges, Curtains, etc. 14

DRY CLEANING
Equipment 28

DRYERS
Air—Fan Blast, see Fans—Ventilating or Exhaust; Blowers—Pressure or Volume—Air Conditioning 26

DRYERS—Cont.
Clothes
—Centrifugal 28
—Coal, Electric, Gas or Steam Heated 28
—Lawn 28
—Rack Type 28
—Tumbler 28
Electric—Hand and Hair 27
Rotary 3
Towels 28

DUCTS
Air Conditioning and/or Sound Deadening, see Acoustical—Materials and Treatments; Sound Deadening Systems 10
Electrical, see Conduit—Electrical—Underfloor 23
Pipe, see Conduit—Tin or Terne Plate 6
Sheet Metal—Heating, Ventilating, Air Conditioning 26
Steel Plate, see Steel—Plate Construction 3
Ventilating—Acidproof 27

DUMBWAITER
Doors
—Counterbalanced 14
—Hollow Metal 14
—Metal Covered — Aluminum, Copper, Bronze, Steel, Stainless Steel, etc. 14
Doors—Steel Plate 14
Enclosures, see Enclosures—Elevator . 14

DUMBWAITERS
Doors for
See Dumbwaiter—Doors 14
Electric 22
Hand Power 22
Hydraulic 22
Tube 22
Undercounter 22

DUMPS
Ash—Fireplace 26

DUST
Collecting Systems 26
Strips, see Weatherstrips 16

DUSTPROOFING COMPOUNDS
Cement and Concrete, see Hardeners and Densifiers—Cement and Concrete 5

DYES
Wood, see Stains—Wood 17

E

EASELS
Picture, see Art Gallery—Fittings . . . 21

EAVES
Troughs, see Gutters—Roof; Sheet Metal Work 6

ECCLESIASTICAL FURNITURE AND ACCESSORIES
Brass, Bronze, Wood, etc. 21
Changeable Letter Boards, see Bulletin—Boards; Directories—Building 21

EDGINGS
Counter, Bar, Desk, Sink, etc., see Trim—Metal for Panels of Metal, Linoleum, Bakelite, Glass, Plywood, etc. 11
Floor Covering—Mastic 11
Floor Covering—Metal 11
Garden Walk 11
Stair, see Nosings—Stair 12

EFFLORESCENCE
Cleaning Compound, see Brick—Cleaning Compound 5
Deterrents, see Waterproofing 5

EJECTORS
Hydraulic or Electric—Automatic—Cellar Draining 27
Sewage 27

ELBOWS
Conductor Pipe, see Conductor—Pipe 6
Conduit, see Conduit—Electrical—Fittings for 23
Flanged or Screwed, see
—Conduit—Electrical—Fittings for 23
—Fittings—Pipe 27

ELECTRIC OR ELECTRICAL
Products, see Specific Products..... 23
Electrical Fountains 21

ELECTROLIERS
Electric, see Standards and Brackets Lamp 24

ELEVATING AND CONVEYING
Machinery 21

ELEVATOR
Annunciators—Electric, see Signal Systems—Electric—Elevator 22
Buckets 21
Cable Equalizers, see Cable—Equalizers 22
Cars, see Cars—Elevator..... 22
Dispatching Controllers, see Signal Systems—Electric—Elevator—Dispatching 22
Door Closers, see Operators—Door—Elevator 22
Door Hangers, see Hangers—Door, Partition or Gate..... 16
Door Interlocks, see Interlocks—Elevator or Dumbwaiter Door.... 22
Door Operators, see Operators—Door—Elevator 22
Doors, see Doors—Elevator; Enclosures—Elevator; Doors—Hollow Metal; Doors—Metal Covered; Doors—Veneered 14
Entrances, see Enclosures—Elevator. 14
Fronts, see Enclosures—Elevator.... 14
Gates, see Gates—Folding..... 20
Illuminated Signs, see Signs—Illuminated—Electric—Interior 24
Indicators—Mechanical, see Signal Systems—Electric—Elevator 22

ELEVATORS
Ash, see Elevators—Sidewalk—Platform; Hoists 22
Automatic Push Button, see Elevators—Electric; Elevators—Residential. 22
Automobile or Carriage, see Elevators—Hand Power; Elevators—Electric; Elevators—Hydraulic or Oildraulic 22
Electric 22
Gravity 22
Hand Power 22
Home—Electric, see Elevators—Residential 22
Hospital, see Elevators—Hand Power; Elevators—Electric; Elevators—Hydraulic or Oildraulic..... 22
Hydraulic or Oildraulic..... 22
Inclined—Domestic 22
Inclined or Vertical..... 22
Invalid, see Elevators—Residential.. 22
Mortuary 22
Portable 21
Residential 22
Screw, see Elevators—Theater—Orchestra, Organ Console, Stage, etc. 22
Sidewalk or Loading Platform..... 22
Theater—Orchestra, Organ Console, Stage, etc. 22
Traction 22
Warehouse, see Specific Type..... 22

ELIMINATORS
Air, see Valves—Air Vent—Steam and Return Main..... 26
Fog, see Fog—Eliminators; Blowers, etc. 26

ELLS
Conductor Pipe, see Conductor—Pipe 6
Pipe, see Fittings—Pipe..... 27

EMBOSSING
Machines 21

EMERGENCY
Exit Devices, see Exit—Devices—Fire or Panic 16
Lighting Systems, see Lighting and Power Systems—Electric—Emergency or Exit Lighting..... 23

EMULSIONS
Asphalt, see Asphalt Emulsions..... 5

ENAMEL
Cement Floor, see Paint—Brick, Cement, Concrete, Stucco, Stone—Preservative Finishing Coats..... 17
Undercoats 17

ENAMELED
Brasses 13
Brick, see Brick—Enameled 4
Metal, see Sheet Metal—Vitreous or Porcelain Enameled 13

ENAMELING
Sheets, see Sheet Metal—Vitreous or Porcelain Enameled 13

ENCLOSURES
Bathtub—for Showers, see Shields—Bathtub for Shower..... 27
Elevator 14
Escalator—Metal—Manual or Automatic 14
Glass 21
Glass—for Showers, see Doors—Shower Stall—Glass; Shields—Bathtub—for Shower 27
Glass—for Sewage Treatment Plants, see Enclosures—Glass 21
Glass—for Swimming Pool, see Enclosures—Glass 21
Glass—for Tennis Courts, see Enclosures—Glass 21
Radiator, see Radiator—Covers and Cabinets 26
Recessed Radiator, see Radiator—Covers and Cabinets..... 26
Sink, see Cabinets; Sinks—Kitchen Cabinet Combination 28
Stock and Tool Room, see
—Fences and Fencing—Wire or Woven Wire; Fences and Fencing—Chain Link 21
—Partitions—Open Mesh 20
Tennis Court, Kennel Yard, Athletic Ground, etc., see Fences and Fencing—Chain Link 21
Toilet, Shower, Dressing Room or Urinal, see Partitions—Toilet, Shower, Dressing Room or Urinal.. 20

ENGINEERS
Acoustical, see Acoustical—Materials and Treatments 10
Air Conditioning, see Air Conditioning Units; Coolers—Unit..... 26
Cast Iron Design..... 13
Chimney, see Chimneys 26
Concrete Construction 2
Consulting 1
Equipment—Food Preparation and Serving 28
Floor Construction, see Floor Construction; Contractors—Flooring.. 3
Foundation 2
Fuel Oil Combustion..... 26
General Construction 2

ENGINEERS—Cont.
Industrial Plant 1
Jail Construction, see Jail—Construction and Equipment 21
Roof Construction, see Contractors and Engineers 6
Sanitary 27
Sewage Disposal, see Sewage—Disposal Systems; Engineers—Sanitary 27
Shoring 2
Soil Testing 1
Steam Power Plant 26
Structural Steel, see Structural—Steel Fabricators, Designers and Welders 3
Swimming Pool 21
Telephone, see Telephone—Service—Public 25
Theater Planning 21
Water Filtration and Cooling..... 27
Water Supply Systems, see Engineers—Sanitary 27
Waterproofing and Dampproofing, see Waterproofing—Contractors 5
X-Ray Protection 10

ENGINES
Diesel 26
Door Operating, see Operators—Door 16
Steam 26

ENTRANCES
Bronze, Iron or Aluminum, see
—Doors—Entrance 14
—Ornamental—Metal Work 13
Wood, see Millwork 8

EQUALIZERS
Elevator Cable, see Cable—Equalizers 22

ESCALATOR
Balustrades, see Balustrades—Escalator 22

ESCALATORS
Electric 22

ESCAPES
Fire, see Fire—Escapes..... 12

ESCUTCHEONS
Door—Keyhole, Knob, etc., see Hardware—Finish Door 16
Water Closet, see Closet—Tank—Fittings 27

EVAPORATORS
Refrigeration 28

EXCHANGERS
Heat, see
—Heat—Exchangers or Interchangers, Economizers, etc..... 26
—Heaters—Water—Indirect 27

EXHAUST
Fans, see Fans—Ventilating or Exhaust 26
Ventilators, see Ventilators—Roof—Power Driven 7

EXIT
Devices—Fire or Panic..... 16
Devices—Turnstiles, see Turnstiles.. 21
Lighting Systems, see Lighting and Power Systems—Electric—Emergency or Exit Lighting..... 23
Signs 24

EXPANDED METAL
Lath, see Lath—Expanded and/or Perforated Metal Sheet..... 9

EXPANSION
Bolts, see Bolts—Expansion..... 16
Joints, see
—Joints—Expansion—Concrete . 3
—Joints—Expansion—Pipe 26
—Joints—Expansion—Roof 6

EXPANSION WING
Metal Lath, see Beads Corner—Metal 9

EXTENSION
Bars, see Hangers—Pipe 26

EXTINGUISHERS
Fire, see Fire Extinguishers 21

EXTRACTORS
Laundry—Centrifugal 28

EXTRUDED AND/OR DRAWN
Metal Shapes 13

F

FABRIC
Concrete Reinforcement, see Concrete—Reinforcement—Wire Mesh 3
Flashing, see Waterproofing—Felt, Cloth, Fabric, etc. 6
Metal—Woven, see Metal Fabric—Woven 26
Wall Coverings 11
Waterproofing, see Waterproofing—Felt, Cloth and Fabric 5

FABRICATORS
Granite, see Granite—Standard Building Monumental 4
Steel Plate, see Steel—Plate Construction 3
Structural Steel, see Structural—Steel Fabricators, Designers and Welders 3
Wire, see Wire—Work 20

FAIENCE
Tile, see Tile—Clay—Ceramic, Decorative and Faience 11

FAN
Hanger Outlets, see Boxes—Outlet—Electric Clock or Fan Hanger 23
Ventilators—Roof, see Ventilators—Roof—Power Driven 7

FANS
Air Circulators, see Fans—Desk, Bracket or Ceiling 26
Attic Ventilating, see Ventilators—Attic—Gable 7
Desk, Bracket or Ceiling 26
Desk, Bracket or Ceiling—Electric Light Combination 26
Kitchen Ventilating, see Kitchen—Fans and Ventilators 26
Ventilating or Exhaust 26
Ventilating or Exhaust—Acid Resistant 26
Window—Ventilating 26

FASCIAS
Window 16

FASTENERS
Casement, see Bolts — Casement Window 16
Conductor Pipe, see Conductors—Pipe—Fasteners and Fittings for . . 6
Corrugated Metal 6
Screen and Storm Sash, see Hardware—Adjusters—Screen and Storm Sash 16
Shutter 16
Wallboard 9
Window, see Bolts—Casement Window 16

FAUCETS
Brass, Nickel Plated, Chromium, etc. 27

FEED WATER
Treatments, see Softeners—Water—Domestic and Industrial, Filters, etc. 27

FEEDERS
Chemical 27

FELT
Acoustical, see Acoustical—Materials and Treatments 10
Hair, see Insulation—House—Blanket or Bat 10
House Insulating, see Specific Type of Insulation as:
—Insulation—House — Blanket or Bat Form 10
—Paper and Felts—Building 6

FELT—Cont.
Insulating, see
—Insulation House—Blanket or Bat Form 10
—Paper and Felts—Building 6
Linoleum Lining, see Linoleum Base—Linings or Subfloor 11
Roofing—Asphalt Saturated, Raybestos, Tarred, etc. 6
Sound Deadening, see
—Insulation—House—Blanket or Bat Form 10
—Paper and Felts—Building 6
Waterproofing, see Waterproofing—Felt, Cloth and Fabric 5
Wool—Lined—for Hot or Cold Water Lines, see Insulation—Cold Storage or Refrigeration, Insulation—High Temperature 10

FENERIES
Wood 21

FENCE
Posts—Concrete 21

FENCES AND FENCING
Chain Link 21
Iron—Electrically Welded 21
Iron or Steel 21
Wire and/or Woven Wire 21
Wood and/or Woven Wood 21

FENDERS
Fireplace, see Fireplace—Accessories . 26

FIBER
Board, see Wallboard—Fiber 10
Conduit—Underfloor—Electrical, see Conduit—Electrical—Underfloor . . 23
Tile Form, see Wallboard—Tiled 11

FILING EQUIPMENT
Drafting Room, see Cabinets—Blue Print and Plan Filing 21
Fire-resistive Safes, see Safes—Fireproof Lightweight 21
Metal 21
Wood 21

FILLER
Metal, see Welding—Electrodes 1
Tile, see Concrete—Filler Tile 3

FILLERS
Concrete 5
Crack or Joint—Cement and Concrete Work, see Joints—Expansion—Concrete—Cement for; Caulking Compounds 5
Wood—Liquid 17
Wood—Paste 17

FILM
X-Ray Film Transfer, see Cabinets—X-Ray Film Transfer 21
X-Ray Storage, see Cabinets—X-Ray Film Safety Storage 21

FILTERS
Air 26
Air—Electrical Precipitation 26
Clay Block—Sewage Disposal, see Tile—Sewer Drain Disposal Plants—Pipe—Drainage and/or Sewer Culvert 27
Drinking Water Fountain, see Fountains—Drinking—Ice Tank Combination; Fountains — Drinking—Refrigerating Unit Combination . . . 27
Gravity or Pressure—Domestic and Industrial 27
(For Removing Iron—Sediment, Taste, Odor, Color, etc.)
Swimming Pool, see Filters—Gravity or Pressure—Domestic and Industrial 27
Water, see Filters—Gravity or Pressure—Domestic and Industrial 27

FINIALS—METAL, see
—Leadwork—Decorative 18
—Ornamental—Metal Work 13
—Terra Cotta; Stone; etc. 4

FINISH
Gymnasium Floor—Non-slippery 17
Wood Floor, see Sealers, Polishers, Wax, etc. 17

FIRE
Alarm Systems—Electric, see Alarms—Fire 25
Alarm Systems—Electric Power Supply for, see Lighting and Power Systems—Electric — Emergency or Exit Lighting 23
Alarms—Tank, see Signal System—Electric—Tank—Alarm 25
Detector Systems, see Alarms—Fire . 25
Doors, see Specific Type of Door as: Hollow Metal; Metal Covered; Rolling Steel; Corrugated Steel; Veneered—Fireproof (Asbestos and Wood Combination); etc. 14
Escapes—Sliding Pole 21
Escapes—Spiral 12
Escapes—Standard 12
Escapes—Straight Slide 12
Escapes—Tubular 12
Exit Devices 21
Extinguishers 21
Extinguishing Apparatus 21
Hose 21
Hose Cabinets, see Cabinets—Hose Fire 21
Hose Nozzles 21
Prevention Systems 21
Rack and Reels 21
Resistant Treatments of Lumber, see Lumber—Fire—Retardant 8
Resisting Wood Doors, see Doors—Veneered—Fire Resisting Asbestos and/or Wood 14
Siamese Hose Connections 21
Sprinkler System Supervision, see Sprinkler System Supervisory Service 21
Station Poles 21
Valves, see Valves—Fire Line 21

FIREPLACE
Accessories—Andirons, Fireset and Stands, Screens, Grates, Fenders, Woodholders 26
Air Heaters—Unit, see Heaters—Air—Fireplace Units—Gas or Electric 26
Ash Dumps, see Dumps—Ash—Fireplace 26
Cleanout Frames and Doors, see Doors—Ash Pit, Trap or Cleanout 26
Dampers, see Dampers—Fireplace . . . 26
Franklin, see Franklin Stoves 26
Gas Heaters, see Heaters—Air—Fireplace—Units—Gas or Electric . . . 26
Grates, see Grates—Fireplace; Fireplace—Accessories 26
Grates—Electric, see Heaters—Air—Fireplace Units—Gas or Electric . . 26
Heat Circulators, see Heaters—Air—Fireplace Units—Gas or Electric . . 26
Heaters, see Heaters—Air—Fireplace Units—Gas or Electric 26
Imitation 26
Linings—Soapstone 4
Mantels, see Mantels 26
Smoke Domes or Chambers 26

FITTINGS
Art Gallery 21
Barrel 27
Bathtub, see Bathtub—Fittings 27
Conduit—Electrical 23
Drainage for Soldering 27
Fire Hose and Tubing 21
Lavatory, see
—Hardware—Lavatory and Toilet Door 20
—Lavatory Fittings 27
Pipe—Acid Resistant 27
Pipe—Acidproof 27
Pipe—Aluminum 27
Pipe—Cast Iron, Malleable Iron, Cast Steel, Bronze, etc. 27
Pipe Conductor 27
Pipe—Copper 27
Pipe Railing 13
Pipe or Tube—for Soldering, Welding or Flared Connections 27
Pipe—Wrought Copper 27

FITTINGS—Cont.
- **Pipe—Wrought Iron** 27
- **Radiator** 26
- **Refrigerating—Pipe,** see Refrigerating—Machinery and Equipment 28
- **Shower Bath,** see Baths—Shower or Needle 27
- **Sweat or Soldered** 27
- **Toilet Partition — Marble, Slate, Metal, etc.** 20
- **Water Closet Tank,** see Closet—Tank Fittings 27

FIXTURES
- **Casement Windows,** see Hardware—Casement Window 16
- **Electric,** see Lighting — Fixtures—Electric; Lamp — Standards and Brackets, etc. 24
- **Laboratory,** see Laboratory—Apparatus and Equipment 21

FLAGGING
- **Asbestos—Cement** 11
- **Asphalt Tile Form,** see Flooring—Asphalt Tile Form 11
- **Bluestone—Sawed** 11
- **Ceramic,** see Tile—Quarry or Promenade 11
- **Marble** 11
- **Sandstone** 11
- **Slate** 11

FLAG POLES
- **Bases for** 13
- **Fixtures for** 13
- **Metal—Steel, Aluminum, Bronze, etc.** 13
  (Including: Canetaper, Entasis Taper, Graduated and Tilting)
- **Steel—Jacketed with Aluminum or Bronze** 13
- **Wood** 13

FLANGES
- **Ceiling—Electrical** 24

FLASHING
- **Bituminous** 6
- **Blocks, Forms, Receivers, etc.** 6

FLASHINGS
- **Combination Metal and Fiber or Fabric** 6
- **Fabric, Asbestos, etc.,** see Waterproofing—Felt, Cloth, Fabric, etc. 6
- **Pipe Flange** 6
- **Plastic** 6
- **Sheet Metal** 6

FLATTING OIL FOR PAINT 17

FLAT WALL FINISH
- **Paint,** see Paint—Wall Finish—Flat, Egg Shell or Gloss 17

FLOATS
- **Car** 3

FLOODLIGHTS
- **Electric** 24

FLOOR
- **Arches,** see Floor Construction 3
- **Armor,** see Grids — Flooring — for Armoring Concrete and Asphalt Floors 11
- **Clips,** see Clips—Floor Sleeper 3
- **Covering Edgings,** see Edgings—Floor Covering 11
- **Coverings,** see Specific Kind of Flooring; as: Linoleum; Cork—Carpet; Flooring—Rubber Tile Form; Rugs and Carpets 11
- **Dividers,** see Strips—Metal—Terrazzo; Floor Composition, Marble, Linoleum, etc. 11
- **Door Checks,** see Checks and Closers—Door—Floor 16
- **Drains,** see Drains—Floor, Yard, etc. 27
- **Fiberized Mastic Roll or Tile,** see Flooring—Fiberized Mastic Roll or Tile Form 11
- **Finishes—Cement,** see Specific Material: Flooring—Cement — Finish for 17
- **Finishing—Sanding — Polishing Machines** 17

FLOOR—Cont.
- **Forms—Metal,** see Forms—Metal... 3
- **Hardeners and Densifiers,** see Hardeners and Densifiers 5
- **Joiners** 11
- **Lights,** see Vaults—Sidewalk Lights for 7
- **Matting,** see Mats 11
- **Plates,** see Plates 11
- **Polish,** see Polish—Liquid; Wax—Floor—Paste or Liquid 17
- **Sleeper Anchors,** see Clips—Floor Sleeper 3
- **Sleeper Supports,** see Clips—Floor Sleeper 3
- **Sound Deadening Systems,** see Sound Deadening Systems 10
- **Voids,** see Concrete—Filler Tile.... 3
- **Wax,** see Wax—Floor—Paste or Liquid 17

FLOOR CONSTRUCTION
- **Concrete—Precast Joist Combination** 3
- **Concrete Reinforced—Flat Slab** 3
- **Concrete Reinforced—Grid** 11
- **Concrete Reinforced—Lightweight—Joist and Filler Tile** 3
- **Concrete—T-Beam and Metal Forms** 3
- **Cork Tile Form** 11
- **Deck—Continuous—Library** 21
- **Glass and Concrete,** see Skylights—Glass, Concrete or Steel Construction 7
- **Gypsum** 3
- **Hollow Tile—Flat and Segmental Arch** 3
- **Light Weight** 3
- **Nailing Concrete,** see Nailing Concrete 3
- **Stack—Library—Reinforced Concrete—Continuous** 21
- **Steel Beam and Electrical Duct System** 23
- **Steel Truss, Plate Joist or I-Beam** .. 3

FLOORING
- **Acid Resistant,** see Specific Type of Flooring, etc. 11
- **Armor,** see Grids—Flooring for Armoring Concrete and Asphalt Floors 11
- **Art Marble** 11
- **Asbestos—Cement** 11
- **Asphalt,** see Asphalt Emulsion 11
- **Asphalt Block or Brick** 11
- **Asphalt Composition Tile Form,** see Flooring—Asphalt Tile Form 11
- **Asphalt Finish for,** see Paint; Varnish; Oil; Wax; etc. 17
- **Asphalt Mastic—Cold** 11
- **Asphalt Mastic—Hot** 11
- **Asphalt Mastic — Tile Form,** see Flooring—Asphalt Tile Form 11
- **Asphalt Plank** 11
- **Asphalt Sheet Form** 11
- **Asphalt Tile Form** 11
- **Beech,** see Flooring—Wood—Maple, Beech or Birch 11
- **Birch,** see Flooring—Wood—Maple, Beech or Birch 11
- **Bluestone** 11
- **Brick,** see Brick — Floor—Packing House, Battery Room, Dairies etc., Brick—Paving 4
- **Canvas,** see Canvas—Roofing and Deck 11
- **Cement,** see —Cement — Mastic — for Laying Wood Floors and Tile Flooring 11
  —Cement—Portland 4
- **Cement—Aggregates for,** see Terrazzo—Aggregates 11
- **Cement—Finish for** 17
- **Cement—Patching for** 11
- **Cement—Pre-mixed** 11
- **Cement—Premixed—Acidproof** 11
- **Cement and Terrazzo—Curing and Protection** 17
- **Contractors,** see Specific Type of Flooring 11

FLOORING—Cont.
- **Cork Composition** 11
- **Cork Tile Form** 11
- **Dividing Strips,** see Strips—Metal; Edging; Dividers—Floor and Cove Base 11
- **End Grain,** see Flooring—Wood Block 11
- **Fiber — Asphalt Combination — Roll, Sheet or Tile Form** 11
- **Finishes,** see Specific Material or Specific Type of Flooring; Cleaners, Polishers and Preservatives .. 17
- **Glass** 7
- **Grating,** see Gratings — Sidewalk, Area, etc. 11
- **Grids,** see Grids—Flooring 11
- **Hardwood,** see Specific Kind as: Flooring—Wood—Oak; etc. 11
- **Industrial,** see Specific Type of Flooring 11
- **Interlocking Rubber,** see Flooring Rubber, Tile Form 11
- **Linoleum,** see Linoleum 11
- **Linoleum—Finish for,** see Varnish, Wax, etc. 17
- **Magnesite Composition** 11
- **Maple,** see Flooring—Wood—Maple, Beech or Birch 11
- **Mastic Composition,** see Flooring—Asphalt Mastic—Cold 11
- **Mastic Composition Tile Form,** see Flooring—Asphalt Tile Form 11
- **Mastic Laid Wood Blocks,** see Flooring—Wood Block 11
- **Mosaic,** see Mosaics; Tile—Ceramic.. 11
- **Oak,** see Flooring—Wood—Oak 11
- **Parquetry,** see Flooring—Wood Block—Tongued and Grooved — Parquetry 11
- **Portland Cement — Colored — Premixed,** see Flooring—Cement Premixed 11
- **Polish for,** see Polish 17
- **Rubber Sheet** 11
- **Rubber Tile Form** 11
- **Slate** 11
- **Soapstone** 11
- **Stone,** see Specific Type of Stone 4
- **Surfacer—for Non-slip,** see Finish—Gymnasium Floor—Non-slip 17
- **Terrazzo,** see Terrazzo 11
- **Terrazzo—Binding Bars,** see Strips.. 11
- **Tile,** see Specific Type of Tile; as: Tile — Clay — Floor and Wall; Flooring—Cork or Rubber Tile Form, etc. 11
- **Wax,** see Wax 17
- **Wood—Air and Moisture Protection,** see Paper and Felts—Building 6
- **Wood Block—Built-up** 11
- **Wood Block—Contractors for** 11
- **Wood Block—Creosoted or Treated** .. 11
- **Wood Block—Mastic Set,** see Flooring—Wood—Mastic Set—Wood Block 11
- **Wood Block—Natural or Untreated** .. 11
- **Wood Block—Tongued and Grooved—Parquetry** 11
- **Wood Composition** 11
- **Wood—Finish for,** see Paints; Varnish; Oil; Wax, etc. 17
- **Wood—American Walnut** 11
- **Wood Finish for,** see Paints; Varnish; Oil; Wax; etc. 17
- **Wood—Fir** 11
- **Wood—Gum and Tupelo** 11
- **Wood—Imported Cabinet Woods** ... 11
- **Wood—Laminated or Plywood** 11
- **Wood—Mahogany** 11
- **Wood—Maple, Beech or Birch** 11
- **Wood—Mastic Set—Strip—Built-up or Assembled; Parquet** 11
- **Wood—Mastic Set—Wood Block** ... 11
- **Wood—Oak** 11
- **Wood—Oak—Factory Finished** 11
- **Wood—Pine** 11
- **Wood—Plank** 11

FLOORING—Cont.
Wood—Plank—Laminated, see Flooring—Wood—Laminated or Plywood 11
Wood—Plywood, see Flooring—Wood Laminated or Plywood 11
Wood—Poplar 11
Wood—Prefabricated—Rubber Topped 11
Wood—Preservatives, see Preservatives—Wood 8
Wood—Teakwood 11
Wood—Treated 8
Wood—Veneered 11

FLOORS
Ballroom—Portable, Lifting, Rotary, etc. 21
Prefabricated and Finish Wood 11

FLOORS—SUB
Surface Leveling 11
Wood, see Specific Type of Flooring 11

FLOWER
Boxes, see Boxes—Flower 21
Pot 21

FLUE
Cleaners, see Soot — Blowers and Cleaners 26
Dampers—Fireplace, see Dampers—Fireplace 26
Linings 4
Wall Outlets, see Ventilators—Wall —Common Brick Size 7

FLUES
Brick, see Chimneys—Common Brick. 26

FLY
Screens, see Screens—Insect 16

FOG
Eliminators 26

FOLDING
Gates, see Gates—Folding 20
Partitions, see Partitions—Folding ... 20
Stairs, see Stairs—Disappearing 12

FOOD PREPARATION AND SERVICE
Equipment, see Furnishings and Equipment—Cafeteria and Restaurant; Kitchen—Equipment; Ranges; Cooking—Utensils, etc. 28

FOOT
Scrapers 13
Wash, see Lavatories 27

FOOTLIGHTS
Electric, see Stage—Fittings and Lighting—Electrical 24

FORGINGS
Metal 13

FORM
Ties, Clamps and Spreaders 3

FORMS
Concrete—Protective Coatings for ... 5
Fiber—Concrete 3
Filler Tile, see Concrete—Filler Tile 3
Flashing, see Flashing—Block, Forms, Receivers, etc. 6
Metal 3
Plywood 3

FOUNDATION CONSTRUCTION
Building, Chimneys, Tanks, etc., see Contractors—Piling; Engineers—General—Construction; Engineers —Foundation 2

FOUNDERS
Metal, see Castings; Ornamental—Metal Work 13

FOUNDRY
Work, see Specific Article as Castings 13

FOUNTAINS
Display and Lawn 21
Drinking—Brass, Bronze, etc. 27
Drinking—Ice Tank Combination ... 27
Drinking—Porcelain Enameled, Vitreous China, Art Marble or Stone Composition 27

FOUNTAINS—Cont.
Drinking—Refrigerating Unit Combination 27
Electric—Interior or Exterior 21
Jet for 13
Musical 21

FRAMES
Blackboard and Bulletin, see Blackboard—Frames 21
Clock 21
Door—Angle Iron or Channel 14
Door—Buck and Trim Units 14
Door—Formed Steel, see Frames—Door—Buck and Trim Units 14
Door—Hollow Metal 14
Door—Metal Covered 14
Door—Wood 14
Light Proof Shade 10
Metal Moulding, see Mouldings; Trim 11
Register Metal, see Registers—Metal Frames for 26
Showcase Metal 13
Steel 3
Wall—Ventilator or Grille 26
Window—Metal 15
Window—Metal—Interchangeable Screen and Storm 15
Window—Steel—Built-in 15
Window—Wood 15
Windows—X-Ray Protection, see Windows—X-Ray Protection 10

FRANKLIN STOVES 26

FRONT
Glass, see —Glassware—Illuminating ..... 24 —Glass—Structural 11

FRONTS
Sink, see Cabinets—Under Sink 28

FRONT WORK
Aluminum, Brass, Bronze or Cast Iron 19
Elevator, see Enclosures—Elevator ... 14
Porcelain Enameled 19
Refrigerator, see Refrigerators—Front Work 28
Terra Cotta, see Terra Cotta—Architectural 4
Tile, see Tile—Clay—Ceramic—Decorative and Faience; Tile—Clay—Ceramic—Floor and Wall, etc. ... 11

FRYERS
Deep Fat 28

FUEL BURNING
Equipment, see Stokers; Burners—Oil 26

FUME
Recovery System 26

FUNGUS
Preventive Treatment for Erected Structures 17

FUR
Fixtures—Cold Storage 28

FURNACE
Controls—Heating, see Dampers; Regulators 26

FURNACES—WARM AIR
Coal—Magazine Feed 26
Coal—Manually Fired 26
Coal—Stoker Fired 26
Conditioners, see Furnaces — Warm Air Forced Circulation Units for ... 26
Forced Circulation—Coal, Gas and/or Oil Fired 26
Forced Circulation Units for—with Filters or Air Moisteners 26
Gas Fired 26
Gravity Circulation—Coal, Gas or Oil Fired 26
Oil Fired 26
Wood Fired 26

FURNACES AND KILNS
Brick 26
Cement 26

FURNISHINGS AND EQUIPMENT
Bank, Office and Library 21
Cafeteria and Restaurant 28
Carpets, see Rugs and Carpets 11
Check Room, see Check Room Equipment 21
Dumbwaiters, see Dumbwaiters; Lifts; Elevators; Hoists 22
Ecclesiastical, see Ecclesiastical Furniture and Accessories 21
Elevators, see Elevators; Lifts; Dumbwaiters; Hoists 22
Filing and Equipment, see Filing Equipment 21
Fire-resistive Safes, see Safes—Fire-resistive — Portable — Wall, etc., Safes — Fire-resistive — Light Weight 21
Hospital 21
Kitchen, see Kitchen—Equipment ... 28
Laboratory 21
Lifts, see Lifts; Elevators; Dumbwaiters; Hoists 22
Rugs, see Rugs and Carpets 11
Schools and Vocational 21
Theater 21

FURNITURE
Cafeteria and Restaurant, see Furnishings and Equipment—Cafeteria and Restaurant 28
Chrome, Modern ..... 21 (Home, Club, Hotel, Reception Room, Apparel and Beauty Shop)
Coverings 21
Ecclesiastical, see Ecclesiastical Furniture and Accessories 21
Garden ..... 21 (Including Marble, Terra Cotta, Wrought Iron and Stone)
Laboratory or Hospital, see Furnishings and Equipment — Hospital; Laboratory 21
Metal 21
Wood 21

FURRING
Cold Formed Channels 9
Gypsum, see Tile Form—Hollow—Gypsum 4
Hollow Tile, see Tile—Hollow Clay or Terra Cotta—Partition, Furring, Beam and Column Covering, etc. ... 4
Spacers 3
Suspended Ceiling Rods 3

FURRING AND STUDDING—METAL
Channel, U-Stud, Bracket, Hollow Partition, etc. 9

G

GABLE
Ventilators, see Ventilators—Attic Gable 7

GAGES, see Gauges 26

GALVANIZING
Work 1

GARAGE
Door Hangers, see Hangers—Door, Partition or Gate 16
Door Hardware, see Hardware—Garage Door 16
Door Hinges, see Hinges—Garage Door 16
Door Operators, see Operators—Door. 16
Drainage Systems, see Drains—Garage 27

GARBAGE
Burners, see Burners—Garbage 28
Chutes, see Chutes — Garbage or Waste 28
Receivers, see Receivers—Garbage ... 28

GARDEN
Flagging, see Flagging 11
Furniture, see Furniture—Garden . . . 21
Pottery, see Pottery—Garden; Terra Cotta—Architectural 21
Walk Edging, see Edgings—Garden Walk 11

GARMENT
Carrier Equipment 16

GAS
Fired Boilers, see Boilers—Heating—Gas Fired 26
Holders—Lift and Pressure 3
Machines or Generators, see Generators—Gas 28
Protective Devices—Bank, Offices, etc., see Protective Devices—Bank, Office, etc.—Gas 21
Stations—Porcelain Enameled, see Sheet Metal—Vitreous or Porcelain Enameled; Front Work 13
Systems for Cooking, etc. 28
Tanked or Bottled 28

GATES
Baffle—Railroad Station, etc. 21
Chain Link 21
Diverting—Sewage Disposal—Tile . . . 27
Elevator—Automatic and Semi-Automatic 22
Elevator—Folding, see Gates—Folding 20
Elevator—Sliding—Freight Car—Vertical Sliding 22
Folding—Lazy Tong and Bostwick . . 20
Iron—Electrically Welded 21
Iron, Bronze or Wire—Plain or Ornamental 21
Mechanically Operated 14
Operators for, see Operators—Door—Sliding, Swinging, Folding, Rolling, etc. 14
Rolling or Coiling, see Grilles and Guards—Rolling or Coiling 14
Sidewalk Door—Spring Guard, see Doors—Sidewalk—Metal or Vault Light—Safety Guarded—Automatically Opened and Closed 26
Turnstiles, see Turnstiles 21
Wire Mesh, see Gates—Iron, Bronze or Wire—Plain or Ornamental 21
Wood 21

GAUGES
Pressure, Temperature, Altitude and/or Vacuum 26

GENERATING SETS
Motor 23
Steam, Turbine and Engine 23

GENERATORS
Electric—A-c. and D-c. 23
Gas—Gasoline 28
Hot Water, see Heaters—Water 27
Steam, see Boilers 26

GIRDERS
Steel Plate 3

GLASS
Actinic 18
Architectural, see Glass—Moulded, Cast or Pressed 18
Art, see Windows—Art Glass 18
Block—Joint Compound, see Cement—Pointing 5
Brick or Block, see Blocks—Glass . . . 4
Bullet Resisting, see Glass—Safety . . 18
Carved, Etched, Ground, Embossed, etc. 18
Clear Sheet 18
Concrete Construction, see Vaults—Sidewalk Lights for; Skylights—Glass, Concrete or Steel Construction 7
Corrugated 18
Diffusing, see Glass—Obscuring and Diffusing 18

GLASS—Cont.
Enclosures—Roof, Swimming Pool, etc., see Greenhouses and Conservatories; Enclosures—Glass 21
Figured, see Glass—Obscuring and Diffusing 18
Heat Absorbing 18
Leaded 18
Lens 24
Masonry, see Brick—Glass 4
Mirrors, see Mirrors—Plate Glass . . . 18
Mosaics 18
Moulded, Cased or Pressed 18
Non-Obscuring—Sheet or Drawn, see Glass—Clear Sheet; Glass—Polished Plate 18
Obscuring and Diffusing 18
Obscuring and Diffusing—Plates or Plaques for Lighting 24
Picture, see Glass—Clear Sheet 18
Plate—Ornamental 18
Polished Plate 18
Prism, see Glass—Obscuring and Diffusing 18
Roofs, see Skylights 7
Safety 18
Shatterproof, see Glass—Safety 18
Shower Doors, see Doors—Shower Stall—Glass 27
Skylight, see Specific Type of Glass . . 18
Stained Windows, see Windows—Art Glass 18
Structural 11
Thermal Shock Resisting 18
Tile Form or Slabs, see Specific Type of Glass 18
Ultra-Violet Ray—Non-intercepting . 18
Vault—Sidewalk and Skylight, see Vaults—Sidewalk Lights for 7
Window and Door, see Specific Types of Glass 18
Wire 18
(Including: Plain, Hammered, Rough, Ribbed, Polished and Figured)
X-Ray Protective 10

GLASS WASHERS
Electric 28

GLASSES
Sight 21

GLASSWARE
Illuminating 24

GLAZE FOR
Paint, see Paint—Glaze 17

GLAZED
Brick, see Brick—Salt Glazed; Brick—Enameled 4
Tile, see
—Hollow Clay or Terra Cotta—Glazed 4
—Paving; Tile—Clay 11

GLAZING
Compounds 18
Construction, see
—Greenhouses and Conservatories . 21
—Skylights 7
—Store Front Construction Metal . 19

GLOBES 21

GLUE
Acoustical, see Cement—Acoustical . 10
For Fabricating Panels and Veneers . . 11
Marine 11

GOLD
Leaf 17

GONGS
Electric, see Bells and Buzzers—Electric 25

GOVERNORS
Steam Pump 26

GRANDSTANDS
Folding—Indoor 21
Outdoor—Portable and/or Permanent 21

GRANITE
Ashlar 4
Cast 4
Crushed 4
Curbing 4
Paving Blocks, see Blocks—Paving—Granite 4
Standard Building, Architectural or Monumental 4

GRATES
Air-Fireplace, see Heaters—Air—Fireplace Units—Gas or Electric 26
Fireplace—Coal or Wood 26
Fireplace—Electric, see Heaters—Air—Fireplace Unit—Gas or Electric . 26
Foundation 26
Sewer Work 13
Shaking and Dumping 26

GRATINGS
Boiler and Engine Room, Sidewalk Area; Bridge or Balcony Floor, Walkways, etc. 11
Drainage—Roadway 27

GRAVITY
Drops, see Elevators—Gravity 22

GREASE
Traps, see Traps—Grease or Oil 27

GREENHOUSE
Ventilating Devices, see Operators—Sash 16

GREENHOUSES AND CONSERVATORIES 21

GREENSTONE
Natural 4

GRIDS
Flooring—for Armoring Concrete and Asphalt Floors 11
Flooring—Electrical Grounding 11
Timber Connectors 8

GRILLES
Cast, see Castings; Ornamental—Metal Work 13
Controlled—Manual or Automatic, see Dampers and/or Registers; Louvers 26
Door and Window—Rolling or Coiling, see Grilles and Guards—Rolling or Coiling 14
Hand Wrought Iron, see Castings; Ornamental—Metal Work 13
High Velocity Air Diffuser 26
Radiator, see Grilles and Screens; Radiator—Covers and Cabinets 26
Recessed Bells 25

GRILLES AND GUARDS
Bank 20
Cast, see Castings; Ornamental—Metal Work 13
Door, Floor and Window 20
Rolling or Coiling 14

GRILLES AND SCREENS
Heating, Ventilating or Air Conditioning—Cast, Stamped, Perforated and/or Woven Metal 26

GROUNDS
Base—Metal, see Base—Screeds and Grounds—Metal 9

GUARD RAILS
Posts, Highways 21

GUARDS
Column 13
Door and Window, see Grilles and Guards—Door, Floor and Window . 20
Door and Window—Rolling or Coiling, see Grilles and Guards—Rolling or Coiling 14
Doorway—Iron—Concrete Armored . . 13
Expanded or Perforated Sheets for, see Sheets 13
Highway—Armored Concrete 13
Light 24

GUARDS—Cont.
Machinery 20
Radiator 20
Screen Door, see Screens—Insect... 16
Skylight 20
Snow 6
Tree, Lawn and Flower Bed, see —Fences and Fencing — Wire and/or Woven Wire..... 21
—Wire—Work 20
Wheel 20
Window—Jail, see Jail—Construction and Equipment 21

GUIDE RAIL LUBRICATORS
Elevator 22

GUM
Lumber, see Lumber—Gum..... 8

GUNS
Caulking 1

GUTTERS
Drain, see Drains—Roof, Gutter or Promenade 27
Hangers for, see Hangers—Gutter... 6
Roof 6
Stable 21

GYMNASIUM
Apparatus 21
Seating—Folding—Portable and/or Permanent, see Grandstands—Folding—Indoor 21
Wardrobes, see Lockers..... 21
Window Guards, see Wire—Work.. 20

GYPSUM
Floors, see Floor Construction—Gypsum 3
Lath, see Lath—Gypsum..... 9
Pre-cast Roofs, see Roof Construction Gypsum 6
Roof Tile, see Roof Construction—Gypsum 6
Roofs, see Roof Construction—Gypsum 3
Sheathing, see Lath—Gypsum; Wallboard—Gypsum 9
Wall Board, see Wallboard—Gypsum 9

H

HAIR
Felt, see Paper and Felts—Building.. 6

HALYARD
Tops, see Flag Poles—Fixtures for... 13

HAMMOCKS
Jail 21

HAMPERS
Clothes 28

HANDLES
Door, see Hardware—Finish—Door.. 16

HANGARS
Door Hardware, see Hardware—Airplane and Dirigible Hangar Door.. 16

HANGERS
Bar—Concrete Reinforcement, see Bars—Reinforcing 3
Beam, Joist, Wall, etc...... 3
Conduit and Cable—Electrical..... 23
Door—Elevator 22
Door, Partition or Gate..... 16
Fire Door 16
Form Concrete 3
Furring—Suspended Ceiling, see Clips —Metal Lath—Ceiling, Stucco Reinforcement 9
Garment 16
Gutter 6
Luminaire, see Lighting Fixtures—Electric Hangers for..... 24
Outlet Boxes and Fixtures..... 23
Pipe 26

HANGERS—Cont.
Pipe Coil 26
Pipe Hangers, Iron for..... 26
Radiator 26
Shaft 26
Theater Curtain 21
Unit Heater..... 26

HARDBOARD
See Wallboard—Fiber 10

HARDENERS AND DENSIFIERS
Cement and Concrete..... 5

HARDWARE
Adjusters—Screen and Storm Sash... 16
Airplane and Dirigible Hangar Door.. 16
Astragal 16
Awning, see Awnings—Rollers and/or Operating Mechanisms for 16
Baffle Gate..... 21
Bar 16
Barn Door..... 16
Bell and Chime 21
Bolts—Cremone (Cremorne), see Bolts—Cremone 16
Builders, see Hardware—Specific Item 16
Bumpers—Unlatching 16
Butts, see Hinges—Butt..... 16
Cabinet 16
Canopy 16
Casement Window—Adjusters and/or Stays 16
Casement Window—Cleaning Hinge. 16
Casement Window—Fasteners and Bolts, see Bolts—Casement Window 16
Casement Window — Sash Lifting Butts and Pivots, see Hinges—Casement—Lifting Butts and Pivots 16
Cold Storage or Refrigerator Door... 28
Door Control 14
Door Hangers, see Hangers—Door, Partition or Gate..... 16
Door—Holders, see Holders—Door.. 16
Finish—Door 16
Fire Door and Shutter, see Hangers—Fire Door 16
Folding Door or Partition..... 16
Garage Door..... 16
Hangers, see Hardware Folding Door or Partition; Hangers..... 16
Hinges, see Hinges..... 16
Lavatory and Toilet Door..... 20
Overhead Type Door..... 16
Reversible Window 16
Revolving Door, see Doors—Revolving —Automatic Panicproof 14
Sash Chain or Cord, see Chain—Sash; Cord—Sash 16
Sash Operators, see Operators—Sash. 16
Sash Pulleys, see Pulleys—Sash..... 16
Screen—Door and Window..... 16
Shelving—Adjustable 16
Show Case or Counter..... 16
Sliding Door, see Hangers—Door, Partition or Gate..... 16
Stable 21
Tent 16
Theater 21
Transom Operators and Lifters..... 16
Wardrobe, see Hanger—Door, Partition or Gate..... 16
Window—Fixture 16
Window Fixtures — Balanced, see Windows—Reversible 15
Window Fixtures — Reversible, see Windows—Reversible 15

HARDWOOD
Flooring, see Flooring—Wood—Specific Type 11
Lumber, see Lumber—Specific Type 8

HARNESS AND BLANKET
Racks 21

HAT
Racks, see Racks—Hat and Coat.... 21

HATCH
Covers and Scuttles..... 13

HEADS
Drinking Fountain, see Fountains—Drinking 27
Exhaust Steam 26
Leader — Cast Lead and/or Lead Coated Copper 6
Leader—Copper 6
Pump—Deep Well, see Pumps—Deep Well—Plunger 27
Shower Bath, see Baths—Shower or Needle 27
Sprinkler, see Sprinkler—Systems—Automatic—Fire 21

HEAT
Exchangers, Interchangers, Economizers, etc. 26
Extractors—Warm Air 26
Generation, see Boilers; Heaters; Furnaces 26
Regulators, see Controllers — Temperature; Thermostats; Regulators —Damper 26

HEATERS
Air Conditioning, see Heaters—Unit. 26
Air—Convector Type, see Radiators —Convector Type 26
Air—Electric—Auxiliary or Bathroom 26
Air—Electric—Portable 26
Air—Fireplace—Units—Gas or Electric 26
Air—Warm Air Furnaces, see Furnaces—Warm Air 26
Convector Type, see Radiators—Convector Type 26
Feed Water 26
Fireplace, see Heaters—Air—Fireplace 26
Furnace Type, see Furnaces—Warm Air 26
Garage—Electric, see Heaters—Air—Electric—Portable 26
Hot Water, see Heaters—Water.... 27
Indirect, see Heaters—Water—Indirect 27
Laundry, see Specific Type of Water Heater 27
Oil Fuel 26
Radiators—Gas 26
Submerged Water, see Heaters—Water—Indirect 27
Unit—Boiler or Furnace Only—Coal, Gas or Oil Fired..... 26
Unit—Boiler or Furnace—Coal, Gas or Oil Fired—Fan or Blower, Air Washer, Moistener and/or Filter.. 26
Unit—Indirect Heat—Gas Fired.... 26
Unit—Indirect Heat with Blower or Fan 26
Unit—Indirect Heat with Fan or Blower, Air Moistener, Washer and/or Filter 26
Unit—Indirect—Warm Air..... 26
Unit—Split System, see Furnaces—Warm Air — Forced Circulation Units for 26
Unit and Cooler Combination..... 26
Water—Coal Fired..... 27
Water — Coal Fired — Combination Water Tank and Burner..... 27
Water—Coal Fired—Garbage Burner Combination, see Burners—Garbage, Waste, Rubbish, etc..... 28
Water—Electric Storage..... 27
Water — Gas — Combination Water Tank and Burner — Manual or Automatic 27
Water—Gas—Instantaneous—Continuous Flow..... 27
Water—Gas—Manual or Automatic. 27
Water—Indirect—Instantaneous or Non-storage 27
Water—Indirect—Non-storage, see Heaters — Water — Indirect — Instantaneous or Non-storage..... 27

HEATERS—Cont.
Water—Indirect—Storage Tank or Boiler 27
Water—Oil Fired—Combination Heat and Hot Water Supply, see Boilers—Oil Fired—Combination Heat and Hot Water 26
Water — Oil Fired — Combination Water Tank and Burner—Manual or Automatic 27
Water—Swimming Pool, see Specific Type of Heater 27
Water—Waste Heat, see Heaters—Water Indirect 27

HEATING SYSTEMS
Bathroom, see Heaters—Air—Electric—Auxiliary or Bathroom 26
Greenhouse and Conservatory, see Greenhouses and Conservatories ... 21
Hot Water 26
Hot Water—Circulators for 26
Vacuum—Vapor and Modulation 26
Warm Air, see Furnaces—Warm Air 26

HEATING AND VENTILATING
Apparatus, see Specific Item as:
—Heaters; Heating Systems; Fans; Blowers; Dampers or Registers; etc. 26
—Ventilators 7
Units Combined, see Heaters—Unit; Ventilating Systems 26

HINGES
Butt—Ball Bearing 16
Butt—Double and/or Single Acting .. 16
Butt—Forged and Wrought Iron, Brass, etc. 16
Butt—Spring, see Hinges—Spring Butt 16
Cabinet Door 16
Casement—Cleaning Hinge, see Hardware—Casement Window—Cleaning Hinge 16
Casement—Sash Lifting Butts 16
Casement—Sash Lifting Pivots 16
Casement Window, see Hardware—Casement Window — Cleaning Hinge 16
Checking, see Checks and Closers—Door 16
Closet Seat 16
Friction 16
Garage Door 16
Gate—Spring Pivot or Spring Butt .. 16
Gravity — Warehouse and Loading Platform 16
Heavy Duty 16
Invisible 16
Lavatory and Toilet Door 16
Pivot—Ball Bearing 16
Refrigerator Door 28
Spring Butt 16
Spring Pivot—Floor 16
Spring Pivot—Floor—Checking 16
Stall Door 16
Vertical Lifting 16

HITCHING
Posts 21

HOG HOUSE 21
Fittings and Fixtures 21

HOISTS
Ash or Merchandise—Platform, see Elevators 22
Ash or Merchandise — Sidewalk — Non-telescopic 26
Ash or Merchandise — Sidewalk — Telescopic 26
Automobile or Carriage, see Elevators—Hand Power; Elevators—Electric; Elevators—Hydraulic or Oildraulic 22
Blast Furnace 22

HOISTS—Cont.
Hydraulic, see Elevators—Hydraulic or Oildraulic 22
Mine 22
Pneumatic or Electric 1
Sidewalk, see Hoists—Ash or Merchandise—Sidewalk 26
Skip 22
Theater—Hand or Electric 22

HOLDERS
Casement Window—Stays, see Hardware—Casement Window—Adjusters and/or Stays 16
Door 16
Fire Door 14
Robe Hooks, see Bathroom Accessories 27
Shutter, see Fasteners—Shutter 16
Soap, Tumbler, Tooth Brush, Sponge, Toilet Paper, etc., see Bathroom Accessories 27

HOLDUP
Alarms, see Alarms—Burglar 25

HOODS
Fume—Chemstone and Soapstone ... 21
Sheet Metal, see Sheet Metal Work. 6

HOOKS
Conductor Pipe, see Conductor Pipe—Fasteners for 6
Fire, see Fire—Extinguishing Apparatus 21
Pipe, see Hangers—Pipe 26

HOOPS
Wire 20

HOPPERS
Incinerator Receiving, see Doors—Hoppers 28

HORNS
Electric 25

HOSE
Cabinets, see Cabinets—Hose—Fire. 21
Fire—Linen or Cotton, see Fire Hose 21
Racks, see Fire—Racks or Reels 21

HOSPITAL
Equipment and Furnishings, see Specific Product; Furnishings and Equipment—Hospital 21
Grid—Flooring—Electrical, see Grids—Flooring—Electrical Grounding. 11

HOT PLATE
Warmers, see Plate—Warmers 28

HOUSE AND ROOF
Insulation, see Insulation — House; Wallboard 10
—Paper and Felts 6

HOUSES
Metal, Portable, Wood, etc., see Buildings 3

HULLS
Boat—Steel 3

HUMIDIFIERS
Air 26

HUMIDIFYING
Systems, see Humidifiers—Air; Air Conditioning 26

HUMIDOSTATS 26

HYDRANTS
Fire 21

HYDRATED
Lime, see Lime—Hydrated 9

HYGROSTATS
See Controllers—Humidity; Humidostats 26

HYPOCHLORITE
Control Apparatus 21

I

ICE MAKING
Machinery and Plants 28

IN-AND-OUT
Boards—Manual or Electric, see Directories—Club, Hotel, etc.—In-and-Out Indicating 25

INCINERATORS
Garbage, Waste, Rubbish, Sewage Sludge Cake and Screening, see Burners—Garbage 28

INDICATORS
Elevator—Mechanical, see Signal Systems Electric—Elevator 22
Flow 26
Speed 23
Temperature, Pressure, Vacuum, see Thermometers—Indicating or Recording; Gauges—Pressure or Vacuum; Thermostats 26

INDIRECT
Water Heaters, see Heaters—Water—Indirect 27

INK
Writing 21

INSECT
Treatment for Lumber, see Preservatives—Wood; Termite Preventive Treatment 8

INSERTS
Concrete 3
Concrete—Steel Window 15
Tread, see Treads—Safety 12

INSPECTION AND TESTING
Structural Materials, Equipment, Efficiency, etc. 1

INSTRUMENTS
Electrical 21

INSULATED
Range Boilers, see Boilers—Range ... 27
Skylight or Roof Lights, see Skylights; Vaults—Sidewalk Lights for 7

INSULATING
Ducts, see Specific Type of Insulation—Cold Storage; Lagging; Acoustical Materials and Treatments 10
Floor and Walls, see Insulation House 10
Glass Vacuum Block, see Tile Form—Hollow Glass 4

INSULATION
Divided into Three Parts—
Cold Storage or Refrigeration 10
High Temperature 10
House 10

INSULATION — COLD STORAGE OR REFRIGERATION 10
Cement Form—Dry or Plastic 10
Lagging Tank, see Lagging—Tank .. 10
Pipe—Brine, Ammonia, Ice Water .. 10
Waterproofing—Compounds for, see Waterproofing Paint and Compounds 5

INSULATION—HIGH TEMPERATURE
Cement Form—Dry or Plastic 10
Moulded or Segmental—Brick, Block or Pipe Covering—Mica 10
Moulded or Segmental—Brick, Block or Pipe Covering—Pressed or Corrugated—Asbestos-Cement 10
Moulded or Segmental—Brick, Block or Pipe Covering—Pressed or Corrugated—Magnesia 10

INSULATION—HIGH TEMPERATURE —Cont.
Moulded or Segmental—Brick, Block or Pipe Covering—Pressed or Corrugated—Wool 10
Pipe or Boiler—Steam or Hot Water. 10
Refractory, See Refractory..... 10
Setting Cement 10
Underground—Pipe 10

INSULATION—HOUSE
(For Structural Board see Wallboard Fiber) 10
Acoustical, see Acoustical Materials and Treatments 10
Air Cell, see Insulation—High Temperature 10
Blanket or Bat Form..... 10
(Including Bats and Batting)
Blocks—Fiber—Furring or Partition. 10
Board or Sheet Form—for Acoustical Treatment, see Acoustical Materials and Treatment 10
Board or Sheet Form—Asbestos-Cement 10
Board or Sheet Form—Cork..... 10
Board or Sheet Form—Fiber..... 10
Board or Sheet Form—Mica..... 10
Board, Paper or Fabric—Aluminum Foil Covered, see Insulation—House—Reflective 10
Concrete—Ready Mixed or Precast.. 10
Felt, see
—Insulation—House—Blanket or Bat Form 10
—Paper and Felts—Building.... 6
Floors, Walls, Roofs and Ceilings, see
—Felt—Roofing; Paper and Felts. 6
—Specific Type of Insulation—House; Acoustical Materials and Treatments 10
Glass Areas 10
Machinery Vibration, see Isolation—Machinery Vibration 10
Mica Pellets 10
Paper, see Paper and Felts—Building. 6
Plaster 10
Powdered or Granulated..... 10
Reflective—Aluminum Foil 10
Reflective—Aluminum Foil Covered—Board, Paper or Fabric..... 10
Reflective—Metal Sheet 10
Reflective—Non-metallic Pigment—Board, Paper or Fabric..... 10
Setting Cement 10
Wool 10
X-Ray Protective, see X-Ray Protective Materials 10

INTAKES OR OUTLETS
Heating, Ventilating or Air Conditioning, see Dampers or Registers; Grilles and Screens..... 26

INTERCEPTORS
Metal, see Traps..... 27

INTERCOMMUNICATING
Systems, see Telephone—Inter or Intra—Communicating Systems... 25

INTERLOCKS
Elevator or Dumbwaiter Door..... 22

IRON
Enameling, see Sheet Metal—Porcelain Enameled 13
Nickel Chrome Alloys, see Metals—Chrome Nickel Iron Alloys..... 13
Removers 17
Work—Ornamental, see Ornamental Metal Work 13

IRONING
Boards 28
Boards—Built-in and/or on the Wall, see Cabinets—Ironing Boards.... 28
Boards—Portable Stand 28
Machines 28

ISOLATION
Machinery Vibrations 10

J

JACKBITS 1

JACKET
Boiler Insulating, see Insulation—High Temperature 10

JACKHAMMERS 1

JACKS
Pumping 27

JAIL
Construction and Equipment..... 21

JAMBS
Door, see Frames—Door—Buck and Trim Units; Trim; Doors..... 14

JARS
Pottery — Garden, see Pottery — Garden 21

JOINTING
Materials—Acidproof 4

JOINTS
Bars—Binding—Floor and Cove Base, see Dividers—Floor and Cove Base 11
Contraction — Terrazzo or Cement Floor, see Joints Expansion—Terrazzo or Cement Floor..... 11
Expansion—Asphalt—Fiber Fillers for 5
Expansion—Concrete 3
Expansion—Concrete—Cement for.. 5
Expansion—Floor and Roof Drain... 27
Expansion—Pipe 26
Expansion—Pipe—Acid Resistant... 27
Expansion—Roof Mastic 6
Expansion—Terrazzo or Cement Floor 11
Masonry—Lead Cap for 5
Pipe—Cement for 6
Structural—Pressure Relieving 3
Wallboard Finishing, see Wallboard—Joint Finisher 11

JOISTS
Bridging for, see Bridging—Joist.... 3
Hangers for, see Hangers—Beam, Joist 3
Reinforced Concrete—Precast 3
Steel 3

JUTE
Pipe Packing 27

K

KALAMEIN
Doors or Partitions, see Doors—Metal Covered 14
Trim, see Trim—Metal Covered.... 11
Windows, see Windows—Metal Covered 15

KALSOMINE
Paint, see Paint—Water..... 17

KEENE'S
Cement, see Plaster—Keene's Cement 9

KETTLES
Electric 28
Galvanizing 3
Steam Jacketed, Gas, Steam Heated —Stainless, Aluminum, Copper, Nickel, etc. 28
Stock—Electric 28

KEY
Cabinets, see Cabinets—Key..... 21
System Control 21

KICK
Plates, see Plates—Door—Kick or Push 16

KILNS AND OVENS
Brick, see Furnaces and Kilns..... 26

KITCHEN
Air Whips — Electric — for Whip Cream 28
Dishwashers, see Dishwashing Machines—Electric 28
Equipment, see Specific Item: Cabinets; Cooking Utensils; Ranges; etc. 28
Fans and Ventilators..... 26
Food Cutters and Grinders..... 28
Grinding Mill, see Kitchen—Food Cutters and Grinders..... 28
Mixing Machines 28
Ovens, see Ovens—Baking..... 28
Planning Desks and Tables, see Cabinets—Kitchen 28
Ranges, see Ranges..... 28
Sink and Dishwasher Combination, see Sinks—Dishwasher Combination 28
Sinks, see Sinks..... 28
Slicing Machines 28
Stoves, see Ranges..... 28
Units—Steel or Wood..... 28
Utensils, see Cooking—Utensils.... 28
Vegetable Peelers 28

KITCHEN—ELECTRICAL
Equipment, see Specific Items as: Broilers; Ranges; Ovens; Kettles; etc. 28
Planning—Service 28

KNOBS
Cabinet 16
Door, see Hardware—Finish—Door.. 16

KNOCKERS—DOOR
Cast Brass or Bronze, see
—Hardware—Finish—Door 16
—Ornamental—Metal Work 13

L

LABORATORY
Apparatus and Equipment..... 21

LACQUER 17
Cork Insulation—Protection for..... 10

LADDER
Treads, see Treads—Safety; Steps—Safety—Ladder 12

LADDER SHOES
Safety 12

LADDERS
Disappearing—Ceiling Suspended, see Stairs—Disappearing—Ceiling Suspended 12
Metal 21
Sliding and Rolling—Store..... 21
Swimming Pool, see Swimming Pool —Equipment—Springboards, Ladders, Safety Equipment, etc..... 21

LADLES
Foundry 13

LAGGING
Tank 10

LAMP
Holders—Electric, see Sockets—Electric 23
Standards and Brackets, see Standards and Brackets—Lamp 24

LAMPS
Floodlighting, see Floodlights—Electric 24
Health—Electric 21
Lighting 23
Lumiline 23
Spotlights, see Spotlights—Electric.. 24
X-Ray 23

LANDINGS
Stair, see Treads—Safety 12

LANTERNS
Bronze, Iron, etc. 24

LATCHES
Lavatory Door, see Bolts—Lavatory Door 20
Refrigerator Door 28

LATH
Arches or Column—Formed—Metal . 9
Corner Bead, see Furring—Cold Formed Channels 9
Cornice Moulding Combination 9
Expanded and/or Perforated Metal Sheet 9
Fiber 10
Floor, see Lath—Expanded and Perforated Sheet 9
Gypsum—Aluminum Foil Covered . . 10
Gypsum—Cork 9
Gypsum—Plain and/or Perforated . . . 9
Insulation, see Insulation—House . . . 10
Interior Corner Reinforcement—Metal 9
Lead Insulated 10
Metal—Insulation or Paper Combination 9
Self-Furring—Metal 9
Tile—Back-up Metal 9
Tools—Cutting and Punching 9
Wire 9
Wood 8
X-Ray Protective 10

LATHING ACCESSORIES 9
Base—Screeds or Grounds, see Base—Screeds and Grounds—Metal 9
Corner Beads, see Beads—Corner Metal; Lath Interior Corner Reinforcement—Metal 9
Invisible Picture Moulding, see Mouldings—Picture 9

LATHING SYSTEM
Gypsum Board or Plaster, see Partition Systems 9

LATTICE
Work, see Furniture—Garden 21

LAUNDRIES
Hot Water Systems for 27

LAUNDRY
Bleaching Apparatus, see Chlorine—Control Apparatus 21
Chute Doors, see Chutes—Laundry Door 28
Chutes, see Chutes—Laundry 28
Dryers, see Dryers—Clothes 28
Equipment and Machinery 28
(Including: Pressers, Starch Equipment, Dampeners, Tables, Trucks, etc.)
Tubs and Trays 27

LAVATORIES
Industrial, see Lavatories—Porcelain Enameled or Vitreous China 27
Porcelain Enameled or Vitreous China 27
Prison or Jail 21

LAVATORY
Brackets or Chairs 27
Door Hardware, see Hardware—Lavatory Door 20
Doors—Metal, see Doors—Toilet . . . 20
Fittings, see Hardware—Lavatory and Toilet Door 20
Partitions, see Partitions—Toilet, Shower, Dressing Room or Urinal . . 20

LAWN
Sprinklers, see Sprinkler Systems 21

LEAD
Blue-Sublimed 17
Oxide 17
Protective for X-Ray, see X-Ray—Protective Material 10
Red 17
White 17

LEADED AND STAINED
Glass, see Glass—Leaded 18

LEADER
Connections—Roof, see Vent Connections—Roof 6
Drains—Roof, see Vent Connections—Roof 6
Heads, see Heads—Leader 6
Pipe, see Conductor Pipe 6
Pipe—Fasteners, see Fasteners—Conductor Pipe 6
Pipe Shoes or Protectors, see Shoes—Leader 6
Shoes or Boots, see Shoes—Leader . . 6

LEADWORK
Decorative 13

LEAF
Gold, see Gold Leaf 17

LEATHER
Artificial 21
Bar Facings 21

LECTERNS
Metal, Wood, etc., see Ecclesiastical Furniture and Accessories 21

LENS
Glass—for Lighting, see Glass—Obscuring and Diffusing Plate or Plaque for—Lighting 24

LETTER OR MAIL
Boxes—Built-in 21
Boxes—Ornamental, see Ornamental Metal Work 13
Chutes, see Chutes—Mail 21

LETTERS
Illuminated Glass 24
Inlaid Vitreous or Porcelain Enameled Metal 13
Metal 13
Paper, Celluloid, etc. 21

LIBRARY
Equipment and Furnishings, see Furnishings and Equipment—Bank, Office and Library 21

LIFE
Buoys 21

LIFTS
Ash Hoists, see Hoists—Ash 26
Book 22
Correspondence, Package, Cash, Coin, etc. 22
Elevator, see Elevators 22
Fuel 22
Hydraulic or Oildraulic, see Elevators—Hydraulic or Oildraulic 22
Incline, see Elevators—Inclined—Domestic 22
Invalid, see Elevators—Residential . . 22
Light—Hand and Power 22
Loading Platform, see Elevators—Sidewalk or Loading Platform 22
Mortuary, see Elevators—Mortuary . . 22
Residence, see Elevators—Residential 22
Theater, see Elevators—Theater—Orchestra, Organ Console, Stage, etc. 22
Trunk, see Dumbwaiters; Elevators; Hoists 22

LIGHTING
Strip, see Stage—Fittings and Lighting—Electrical; Lighting Fixtures—Electric 24

LIGHTING EQUIPMENT
See Lighting Fixtures—Electric . . . 24

LIGHTING FIXTURES—ELECTRIC
Aisle Lighting, see Reflectors—Aisle Lighting 24
Architectural — Building, Exterior, Show Window, etc., see Floodlights 24
Bank Screen, Showcase, Window, Church, Concealed, etc. 24
Built-in, see Lighting Fixtures—Electric—Bank Screen, Showcase, Window, Church, Concealed, etc. 24
Check Desk, etc. 24
Commercial, see Lighting Fixtures—Electric—Interior 24
Concealed or Cove Lighting, see Lighting Fixtures—Electric—Bank Screen, Showcase, Window, Church, Concealed, etc. 24
Direct or Semi-direct, see Lighting Fixtures—Electric—Bank, Screen, Showcase, Window, Church, etc.; Lighting Fixtures—Electric—Interior 24
Exit Signs, see Exit—Signs 24
Exterior 24
Fan Combination, see Fans—Desk, Bracket or Ceiling Lighting Fixture Combination 26
Floodlights, see Floodlights 24
Fluorescent 24
Gasproof, Vaporproof, Weatherproof, etc., see Reflectors—Gasproof, Vaporproof, Weatherproof 24
Glass Plates or Plaques for Lighting, see Glass—Obscuring and Diffusing—Plates or Plaques 24
Glassware, see Glassware—Illuminating 24
Guards for 24
Hospital, see Lighting Fixtures—Electric—Night Light or Hospital 24
Indirect—Cove, see Lighting Fixtures—Electric—Bank Screen, Showcase, Window, Church, Concealed, etc. 24
Indirect and Semi-indirect, see Lighting Fixtures—Bank Screen, Showcase, Window, Church, etc.; Lighting Fixtures—Electric—Interior . . . 24
Industrial, see Reflectors—Industrial 24
Interior 24
(Including: Direct, Indirect and Semi-Indirect)
Lanterns, see Lanterns 24
Mercury Vapor 24
Night Light or Hospital 24
Reflectors, see Reflectors—Lighting . 24
Residential, see Lighting Fixtures—Electric—Interior 24
Show Window, see Lighting Fixtures—Electric—Bank Screen, Showcase, Window, Church, etc. 24
Shower Bath, see Reflectors—Lighting — Gasproof, Vaporproof, Weatherproof, etc. 24
Spill Shields for 24
Spotlights, see Stage—Fittings and Lighting—Electrical 24
Stage Lighting, see Stage—Fittings and Lighting—Electrical 24
Swimming Pool—Submarine Lighting, see Swimming Pool—Submarine Lighting 21

LIGHTING AND POWER SYSTEMS—ELECTRIC
Emergency or Exit Lighting 23
Library, Laboratory or Experimental . . 21

LIGHTNING
Conductors 23
Rods 23
Rods, Repairing and Installing 23

LIGHTPROOF
Curtains, see Shades—Lightproof . . . 16

LIGHTS
Floor, see Vaults—Sidewalk Lights for 7

LIGHTS—Cont.
Roof, see Vaults—Sidewalk Lights for . . . 7
Transom—Prism—Store Front . . . 7
Vault and Sidewalk, see Vaults—Sidewalk Lights for . . . 7

LIME
Hydrated . . . 9
Hydrated Finishing, see Plaster—Lime—Hydrated Finishing . . . 9
Hydrated Masons' . . . 4
Hydraulic Masons' . . . 4
Quick—Lump, Pebble, Pulverized . . . 9
Waterproofed . . . 4

LIMESTONE . . . 4

LINEN
Chutes, see Chutes—Laundry . . . 28

LININGS
Bin—Stainless Steel . . . 11
Cell, see Jail—Construction and Equipment . . . 21
Cement—Tank, Boilers, etc. . . . 27
Chimneys, see Chimneys—Linings for . 26
Closet, see Closet—Lining . . . 11
Cloth—Wall . . . 11
Fireplace—Air Heaters, see Heaters—Air—Fireplace Unit . . . 26
House, see Insulation—House . . . 10
Paper, see
—Insulation—House . . . 10
—Paper and Felts—Building . . . 6
Steel Stack, see Chimneys—Common Brick; Chimneys—Radial Brick . . . 26
Tank, see Lagging Tank . . . 10
Vault . . . 21
Window Reveal—Metal, see Casings—Window—Metal . . . 9

LINOLEUM
Bars or Strips—Binding, see Edgings—Floor Covering; Strips—Metal . . . 11
Base, Lining or Subfloor . . . 11
Cement—Linoleum to Felt, Wood . . . 11
Cleaning Compounds, see Cleaners, Polishers and Preservatives—Tile, Marble, Linoleum, Brick, etc. . . . 17
Cork Carpet, see Cork—Carpet . . . 11
Finish for . . . 17
Finishing—Oil, see Oil—Floor Finishing—Cement, Magnesite, Terrazzo, etc. . . . 17
Linings, see Linoleum—Base, Linings or Subfloors . . . 11
Plain, Jaspé, Inlaid, Inset Tile, Embossed, Printed and Battleship . . . 11
Tile Form, see Linoleum — Plain, Jaspé, Inlaid, Inset Tile, Embossed and Printed; Flooring—Cork Composition . . . 11
Wall Covering, see Coverings—Wall—Linoleum . . . 11

LINSEED
Oil . . . 17

LINTELS
Brick, Stone or Tile, see Specific Kind of Brick, Stone, Tile . . . 4
Metal—Fireplace . . . 26
Metal—Window . . . 15

LOCKERS
Food Storage . . . 21
Steel . . . 21
Wood—Receding Door, see Wardrobes—Wood—Receding or Disappearing Door . . . 21

LOCKS
Coin Pay . . . 20
Dumbwaiter Door . . . 22
Emergency Exit, see Exit Devices—Fire or Panic . . . 16
Lavatory Door, see Bolts—Lavatory Door . . . 20
Safe and Vault . . . 21
Sliding—Glass or Wood Door . . . 16
Sliding—Open Mesh—Door or Partition . . . 20
Stall Door—Barn . . . 16

LOCK-UPS
Jail, see Jail — Construction and Equipment . . . 21

LOG
Houses . . . 3
Rollers—Fireplace, see Fireplace Accessories . . . 26

LOGS
See Lumber . . . 8

LOOM
Flexible — Electric, see Conduit—Electrical—Flexible—Non-metallic 23

LOUDSPEAKERS
Radio, see Public Address—Systems . 25

LOUVERS
Air Conditioning and/or Ventilating . 26
Door-Ventilating . . . 16
Heat Controls, see Dampers or Registers . . . 26
High Velocity—Air Diffusers . . . 26
High Velocity—Air Diffusers—Light Combination . . . 26
Lead Coated, see Louvers—X-Ray Protective . . . 10
Light Beams, see Deflectors—Light . . . 24
Light Diffusing, see Diffusers—Light 24
Lightproof—Window Lightproof, see Ventilators . . . 16
Look Out—Bank, Post Office, Stores, etc. . . . 21
Wall Ventilating, see Ventilators, Wall . . . 7
X-Ray Protective . . . 10

LOW WATER
Protective—Boiler, see Boiler—Low Water Protector . . . 26

LUMBER
Asbestos, see Siding — Asbestos — Cement; Roofing—Asbestos—Plain or Corrugated . . . 6
Wallboard—Asbestos—Cement . . . 11
Ash, Hickory, Basswood and Butternut . . . 8
Beech . . . 8
Birch . . . 8
California Red Wood, see Lumber—Redwood . . . 8
Chestnut . . . 8
Cottonwood . . . 8
Creosoted or Salt Treated . . . 8
Cypress . . . 8
Elm . . . 8
Fir—Douglas, White, etc. . . . 8
Fire Retardant Treatment . . . 8
Gum . . . 8
Hackberry . . . 8
Hardwood, see Specific Type of Lumber . . . 8
Hemlock—West Coast and/or Northern . . . 8
Imported Cabinet Woods . . . 8
Insect Preventive Treatment for, see Termite Preventive Treatment . . . 8
Larch . . . 8
Magnolia . . . 8
Mahogany . . . 8
Maple . . . 8
Moulding, see Trim—Wood . . . 8
Oak . . . 8
Pecan . . . 8
Persimmon . . . 8
Pine . . . 8
Plywood, see Plywood . . . 8
Redwood . . . 8
Red Cedar . . . 8
Spruce . . . 8
Structural, see Specific Type; Lumber—Creosoted or Salt Treated . . . 8
Sycamore . . . 8
Tupelo . . . 8
Walnut . . . 8
Willow . . . 8
Yellow Poplar . . . 8

LUMINAIRES, see Lighting Fixtures—Electric . . . 24

M

MACHINERY
Isolation or Insulation of Vibrations, see Isolation—Machinery Vibrations . . . 10
Special Elevator . . . 22

MACHINES
Curtain, see Curtains—Theater Stage—Automatic Controls or Operators for . . . 21
Grooving . . . 1

MAGNESIA
Pipe or Boiler Coverings, see Insulation—High Temperature . . . 10

MAGNESITE
Composition — Finishing Compounds for, see Flooring—Magnesite Composition . . . 11
Floor Finishing Compounds, see Oil—Floor Finishing—Cement, Magnesite, Terrazzo, etc. . . . 17

MAGNETIC
Switches, see Switches—Electric—Magnetic . . . 23

MAIL
Boxes, see Letter or Mail—Boxes . . . 21
Chutes, see Chutes—Mail . . . 21
Receivers, see Letter or Mail Boxes . . 21

MANGERS
Horse, see Stable—Fittings and Fixtures . . . 21

MANHOLE
Covers, see Covers and Frames—Manhole . . . 13
Doors, see Doors—Ash Pit, Trap or Clean-out . . . 26
Dustpan . . . 13

MANTELS
Artificial Stone . . . 26
Marble . . . 26
Portable . . . 26
Soapstone . . . 26
Tile, see Tile—Clay—Ceramic . . . 11
Wood . . . 26

MAPLE
Flooring, see Flooring — Wood — Maple . . . 11
Lumber, see Lumber—Maple . . . 8
Wood, see Lumber—Maple . . . 8

MARBLE
Artificial, see
—Art Marble . . . 11
—Scagliola . . . 9
—Stone—Cast . . . 4
Ashlar . . . 4
Cleaning Compounds, see Cleaners, Polishers and Preservatives—Tile, Marble, Linoleum, Brick, etc. . . . 17
Crushed . . . 4
Floor Dividing Strips, see Strips—Metal—Terrazzo Floor, Composition, Marble, etc. . . . 11
Interior and Exterior—Foreign or Domestic . . . 4
Slabs—Translucent . . . 4

MARKERS
Grave—Bronze . . . 13
Sewer . . . 13
Traffic . . . 13

MARQUISES . . . 13

MASTIC
Flooring, see Flooring—Asphalt Mastic . . . 11
For Structural Glass, see Glazing Compounds . . . 18

MASTS
Tubular Steel, see Flag Poles—Steel . 13
Wireless, see
—Flag Poles—Steel . . . 13
— Structural — Steel Fabricators, Designers and Welders . . . 3

MATS
Cork—Machinery Foundation or Isolation, see Isolation Machinery—Vibrations 10
Link 11
Rubber 11

MATTINGS
Cocoa 21
Electric—Alarm Combination 25

MAUSOLEUMS
Granite, Marble, etc., see Granite, Marble 4

MECHANICAL
Rubber Goods 27

MEDICINE
Cabinets, see —Bathroom Accessories—Cabinets 27 — Cabinets — Hospital — Instrument, Warming, Bed Pan, etc.. 21

MEMORIALS
Art Glass Window, see Glass—Leaded; Windows—Art—Glass . . 18
Granite, Marble, etc., see Granite; Marble 4
Metal, see Ornamental—Metal Work 13

METAL
Castings, see Castings 13
Fabric, see Concrete Reinforcement—Wire Mesh 3
Lath, see Lath 9

METAL PLATE
Construction, see Steel Plate Construction 3

METAL COVERED
Concrete Stone, see Stone—Concrete —Metal Covered 4
Doors, see Doors—Metal Covered . . . 14
Mouldings, see Mouldings—Metal Covered 11
Trim, see Trim—Metal Covered 14

METAL FABRIC
Woven—for Screens, Grilles, Guards . 26

METAL WORK
Ornamental, see Ornamental—Metal Work 13

METALS 13
(See also Sheet Metal) 13
Acid Resistant 13
Aluminum 13
Brass, Bronze, Copper or Nickel Silver 13
Chrome Nickel and Straight Chrome —Stainless Iron and Steel 13
Copper Silicon Alloys 13
Copper Steel Alloy 13
Corrosion and Rust Resistant 13
Expanded—Fabricated Products 20
Heat Resistant 13
Iron Enameling 13
Iron Silicon Alloys 13
Nickel Copper Alloys 13
Porcelain Enameled, see Sheet Metal —Vitreous or Porcelain Enameled. 13
Stainless Steel, see Metals—Corrosion and Rust Resistant; Metals—Chrome Nickel and Straight Chrome —Stainless Iron and Steel 13

METERING
Panels—Electric for Apartments, Office Buildings, etc. 23

METERS
Electric—Watthour 26
Flow 26

MICROPHONES
Radio, see Public Address—Systems. 25

MILK AND PACKAGE RECEIVERS, see Receivers—Milk Bottle and Package 28

MILDEW
Preventatives, see Fungus and Mildew Preventatives

MILLWORK
General 8

MINERAL
Wool, see Insulation—House—Wool 10

MIRRORS
Plate Glass 18

MIXERS
Dough, Cake, etc., see Kitchen—Mixing Machines 28
Shower Bath, see Valves—Mixing —Shower Bath 27
Steam and Water, see Valves—Mixing 27

MOLDINGS
Picture, see Mouldings—Picture . . . 9
Wood, see Trim—Wood 8

MONEY CHESTS
Safes, see Safes—Fire-resistive—Portable 21

MONUMENTS
Granite, Marble, etc. see —Memorials — Granite, Marble, etc.; Mausoleums—Granite, Marble, etc.; Granite; Marble . . 4
Metal, see Ornamental—Metal Work 13

MOPPING
Machines 17

MOPS
Floor 17

MORTAR
Admixtures, see Specific Type as: Waterproofing 5
Asbestos, see Plaster—Gypsum—Prepared or Finishing 9
Bricklayers', see —Cement—Masonry . . . . . 4 —Plaster—Lime Hydrated Finishing 9
Colors, see Colors—Mortar—Cement and Stucco 5
Hydrated Lime and Cement, see Lime —Hydrated Masons'; Cement—Portland 4
Hydraulic Lime 4
Lime Hydrated Finishing, see Plaster —Lime Hydrated Finishing 9
Nailing Concrete, see Nailing—Concrete 3
Portland Cement 4
Portland Cement—Colored 4
Portland Cement—Non-staining, see Cement—Non-staining 4
Portland Cement—Waterproofed, see —Cement — Portland — Waterproofed . . . . . 4 —Waterproofing—Integral 5
Waterproofing, see Waterproofing—Integral 5

MORTUARY
Coolers, see Refrigerators—Mortuary 28
Lifts, see Elevators—Mortuary 22
Racks 28
Trucks 28

MOSAICS
Ceramic, see Tile—Clay—Floor and Wall 11
Glass 18

MOTHPROOFING, see Closet—Lining . . 11

MOTION PICTURE
Screens, see Screens and Frames—Motion and Talking Pictures 21
Theater Equipment, see Furnishings and Equipment—Theater 21

MOTOR
Generator Sets, see Generating Sets —Motor 23
Operated Curtains—Ceiling, Roof, Stages, etc., see Curtains—Ceiling, Roof, Stage, etc.—Motor Operated 14

MOTOR—Cont.
Operated Doors, see Doors—Mechanically or Motor Operated 14
Starters, see Switches—Electric—Motor Starting 23

MOTORS
Electric—A. C. 23
Electric—D. C. 23
Electric—Damper Regulator or Control 26

MOULDINGS
Asbestos—Cement 11
Base, see Cove Base; Flooring 11
Blackboard, see Blackboard Moulding. 21
Cane Fiber, see Mouldings—Fiber . . 11
Clip or Snap-on 11
Cork 11
Electrical Wiring, see Conduit—Electrical—Metal Moulding or Raceway 23
Extruded or Drawn Metal 13
Fiber 11
Hollow Metal 11
Metal Covered 11
Metal, see Mouldings—Hollow Metal; Mouldings—Metal; Covered 11
Metal for Wallboard Application, see Trim—Metal—for Panels of Metal, Linoleum, Bakelite, Glass, Plywood, etc. 11
Picture—Metal—Concealed 9
Picture—Wood 8
Rubber, see Flooring—Rubber Sheet 11
Tile, see Tile—Clay—Ceramic; Tile —Paving; Cove Base—Tile 11
Wood, see Trim—Wood; Mouldings —Picture—Wood 8
Wood Fiber, see Mouldings—Fiber . 11

MOVEABLE
Blackboards, see Blackboards—Disappearing 21

MOVING
Stairways, see Escalators—Electric . . 22

MUSEUM
Cases 21
Fittings 21

MUSHROOM
Ventilators, see Ventilators — Mushroom 7

MUSIC
Reproduction Systems, see Program—Distribution Systems 25

N

NAILING
Concrete 3

NAILS
Aluminum, Brass, Copper or Galvanized 13
Metal Lath—Self-Furring 9
Slating, Shingle, Siding, etc. 6
Stub 9
X-Ray Protective 10

NAME PLATES
Changeable Letter, see Directories—Building 21
Metal—for Building Directories, see Directories—Building 21
Removable Letter, see Directories—Building 21
Stable, see Stable—Fittings and Fixtures 21

NATATORIUM
Design and Construction, see Swimming Pool—Design and Construction 21

NEWELS
Brass and Bronze 11
Wood 8

NEWSPAPER
Racks, see Book—Stacks 21

NICKEL
Castings, see Castings—Nickel 13
Chrome Iron Alloys, see Metals—Chrome, Nickel, Iron Alloys..... 13
Metal, see Metals—Nickel 13
Rods, see Rods and Bars—Nickel .. 13
Tubing, see Tubes and Tubing—Nickel 27

NICKEL COPPER ALLOYS
Castings, see Castings—Nickel Copper Alloys 13
Metal, see Metals—Nickel Copper Alloys 13
Rods, see Rods and Bars—Nickel Copper Alloys 13
Tubing, see Tubes and Tubing—Nickel Copper Alloys 27

NIGHT
Depositories—Bank, see Safes—Night Depository 21

NIPPLES
Pipe, see Fittings—Pipe 27
Pipe—Electrical Conduit see Conduit—Electrical—Fittings for 23

NOSINGS
Stair—Art Marble, see Treads and Nosings—Safety 12
Stair—Cork, see Flooring—Cork Tile Form 11
Stair—Metal 12
Stair—Rubber, see Flooring—Rubber Tile Form..... 11
Stair—Safety 12

NOZZLES
Fire Hose, see Fire—Hose Nozzles.. 21
Spray 26

NUMERALS
Illuminated, see Letters—Illuminated Glass 24

NUTS AND BOLTS
Aluminum 13
Rib 3
Wire 23

O

OAK
Flooring, see Flooring—Wood—Oak 11
Lumber, see Lumber—Oak 8

OIL
Burners, Equipment and/or Systems, see Burners—Oil and/or Equipment 26
Burning Heating Units, see Heaters. 26
Cedar 17
Circuit Breakers, see Circuit—Breakers 23
Creosote or Coal Tar, see Preservatives—Wood 8
Fired Boilers, see Boilers—Heating—Oil Fired 26
Flatting—Paint, see Flatting Oil for Paints 17
Floor Finishing—Cement, Magnesite, Terrazzo, etc. 17
Fuel—Storage Tank—Ventilators... 26
Furnaces, see Furnaces—Warm Air—Oil Fired..... 26
Linseed, see Linseed—Oil 17
Proofing, see Waterproofing 5
Resistant Paint, see Paint—Acid, Alkali or Oil Resistant 17
Separators, see Separators—Oil or Grease 27

OIL REFINERY
Equipment 3

OPERATORS
Awning, see Awnings—Roller and/or Operating Mechanisms for 16
Casement Windows, see Hardware—Casement Window—Adjusters and /or Stays 16
Door—Elevator 22

OPERATORS—Cont.
Door—Garage—Electric 16
Door—Garage—Radio Control 16
Door—Photo-electric Unit 16
Door—Prison or Jail, see Jail Construction and Equipment 21
Door — Sliding, Swinging, Folding, Rolling, etc. 16
Gate—Elevator, Bank and Partition.. 14
Sash 16
Sidewalk Door, see Doors—Opening and Closing Devices for..... 26
Theater Curtain, see Curtains—Theater Stage—Automatic Controls or Operators for..... 21
Transom, see Hardware—Transom... 16

ORCHESTRA
Elevators, see Elevators—Theater—Orchestra, Organ, Console, Stage, etc. 22

ORGANS
Console—Electric 21

ORNAMENTAL
Iron, see Ornamental—Metal Work.. 13
Metal Work 13
Metal Work—Enameled, see Sheet Metal—Vitreous or Porcelain Enameled 13

ORNAMENTS
Aluminum, see Ornamental—Metal Work; Castings—Aluminum 13
Cast Iron, see Castings—Iron—Architectural; Ornamental — Metal Work 13
Lead, see Leadwork—Decorative.... 13
Porcelain Enameled, see Sheet Metal—Vitreous or Porcelain Enameled. 13
Pressed Steel 13
Terra Cotta, see —Terra Cotta—Architectural.... 4
Wall Board, see Wallboard—Fiber.. 10

OUTLETS
Convenience, see Receptacles—Electric—Convenience Outlets 23

OVENS
Baking and Roasting—Gas..... 28
Baking and Roasting—Electric..... 28

OVERFLOWS
Sink—Standing—Acid Resistant, see Sink Outlets—Strainers—Acid Resistant 27

OVERHEAD
Carrying Systems, see Conveyors—Overhead Carrier 21
Door Hardware, see Hardware—Overhead Door; Hardware—Garage ... 16

OVERHEAD TYPE
Doors, see Doors—Overhead Type... 14

P

PACKAGE AND MILK RECEIVERS
see Receivers—Milk Bottle and Package 28

PADS
For Isolation or Insulation of Vibrations, see Isolation—Machinery—Vibration 10

PAGING
Systems, see Signal Systems; Telephone—Signal System Combination; Bells and Buzzers 25

PAILS
Fire, see Fire—Extinguishing Apparatus 21

PAINT
Acid, Alkali, Caustic or Oil Resistant 17
Acoustical Material Surfacing 17
Aluminizing or Bronzing 17

PAINT—Cont.
Aluminum or Bronze—Vehicle for.. 17
Asphalt, see Asphalt—Emulsion ... 5
Blue Lead, see Lead—Blue..... 17
Boiler and Stack, see Paint—Stack and Boiler 17
Brick, Cement, Concrete, Stucco, Stone — Preservative Finishing Coats 17
Caen Stone Finish, see Paint—Texturing; Paint—Brick, Cement, Concrete, Stucco, Stone—Preservative Finishing Coats; Paint—Water... 17
Calcimine, see Paint—Water..... 17
Calcimine Sealer, see Waterproofing—Paints and Compounds 17
Canvas 17
Casein—Paste 17
Casein—Powder 17
Caustic Resistant, see Paint, Acid, Alkali, Caustic or Oil Resistant... 17
Cement, see Paint—Portland Cement 17
Cement Floor, see Paint—Brick, Cement, Concrete, Stucco, Stone—Preservative Finishing Coats; Cement 17
Cold Water, see Paint—Water 17
Colors for, see Paint—Pigments ... 17
Creosote or Bitumen Sealing 17
Deck, see Paint — House — Ready Mixed 17
Enamel, see Enamel 17
Factory Window Glass 17
Fire Resisting, see Paint—Stack and Boiler 17
Flat Wall Finish, see Paint—Wall Finish—Flat, Egg Shell or Gloss.. 17
Galvanized Metal, see Paint—Metal Protective; Paint — Primers— Iron or Steel 17
Gas Holder 17
Glaze 17
Graphite 17
Heat Resistant, see Paint—Stack and Boiler 17
House—Ready Mixed 17
Joint, see Caulking Compounds; Cement—Pointing 5
Machinery 17
Masonry, see Paint—Brick, Cement, Concrete, Stucco, Stone—Preservative Finishing Coats 17
Metal Protective 17
Mill White 17
Oil Resistant, see Paint—Acid, Alkali or Oil Resistant..... 17
Pigments 17
Plastic, see Paint—Texturing 17
Porch, see Paint—House — Ready Mixed 17
Portland Cement 17
Primers—Steel, Iron or Zinc..... 17
Priming—Plaster, see Sizing; Enamel Undercoats; Paint—Brick, Cement, Concrete, Stucco, Stone—Preservative Finishing Coats..... 17
Priming—Wood or Metal, see Paint—House; Enamel — Undercoats; Paint—Metal Protective 17
Red Lead, see Lead—Red..... 17
Remover 17
Roof and Barn..... 17
Rust Inhibitive 17
Shellac, see Shellac and Shellac Substitutes 17
Sizing, see Sizing; Enamel—Undercoats; Paint—Brick, Cement, Concrete, Stucco, Stone—Preservative Finishing Coats 17
Stack and Boiler 17
Structural Steel, see Paint — Metal Protective; Paint—Primers—Steel and Iron..... 17
Technical 17
Termite or Fungus Preventive, see Termite—Preventive Treatment for Erected Structures 17
Texturing 17

PAINT—Cont.
Undercoating, see Paint—House; Enamel—Undercoats; Paint—Metal Protective 17
Vehicle for 17
Wall Finish—Flat, Egg Shell or Gloss 17
Washable Wall Finish, see Paint—Wall Finish—Flat, Egg Shell or Gloss 17
Water 17
Waterproofing, see Waterproofing—Paint and Compounds 5
White Lead, see Lead White 17
X-Ray Protective 10
Zone Marking—Traffic 17

PANELBOARDS—LIGHTING AND POWER
Dead and Live Front 23
Dead and Live Load—Knife Switches and Circuit Breakers 23
Laboratory 23
Metering 23

PANELING
Wood, see Cabinet Work; Millwork. 8
Panels—Veneered 11

PANELS
Access, see Doors—Access 27
Acoustical, see Acoustical—Materials and Treatments 10
Asbestos Cement, see Wallboard—Asbestos—Cement 11
Control, see
—Controllers—Motor 23
—Controls—Air Conditioning ... 26
Door—Ventilating, see Louvers—Door Ventilating 16
Feed 21
Fibre, see Wallboard—Fiber 10
Glass, see Glass—Structural 11
Gypsum—Veneered—Wood 9
Metal Building, see Front Work—Porcelain Enamel 19
Metal Surfaced Plywood, see Plywood—Metal Surface 8
Metal Surfaced for Acoustical Treatment, see Acoustical Materials and Treatments 10
Phenolic Fiber 11
Phenolic Fiber—Resin Plywood 11
Plywood, see Plywood 8
Porcelain Enameled, see Sheet Metal—Vitreous or Porcelain Enameled. 13
Rubber, see Flooring—Rubber 11
Switch Box 14
Veneer—Cloth Backed, see Coverings—Wall—Cloth Backed Wood Veneer 11
Veneered—Gypsum, see Wallboard—Wood Grain Finish 11
Veneered—Wood 11
Wire, see Partitions—Open Mesh... 20
X-Ray Protective 10

PANIC
Alarms, see Alarms—Fire 25
Exit Devices—Locks, see Exit Devices Fire or Panic 16

PANS
Annealing, Drying and Evaporating .. 3
Bunker, see Bunker—Pans 28
Hot 28
Shower 27

PANTRY
Cabinets, see Cabinets—Kitchen—Metal; Cabinets—Kitchen—Wood 28
Sinks, see Sinks 28

PAPER
Toilet, see Toilet—Paper 27
Toilet—Holders for, see Bathroom Accessories 27
Towel Holders, see Bathroom Accessories 27
Towels, see Towels—Paper 27
Wall Coverings, see Coverings—Wall Paper 11

PAPER AND FELTS
Building 6
Building—for Protection During Construction, see Flooring—Cement and Terrazzo—Curing and Protection 17
Condensation Retardant 10

PARTING
Beads—Metal Interlocking 16

PARTITION
Hardware, see Hangers—Door, Partition or Gate; Hardware Folding Door or Partition 16

PARTITION SYSTEMS
Metal, Wood, etc.—Prefabricated, see Partitions 20
Structural Members and Lath for Plastering 9
Structural Members and Plaster Board for Plastering 9
Structural Members and Finish Board . 9

PARTITIONS
Bank, Office Cage, Factory, School .. 20
Cubicle—for Hospitals and Institutions, see Screens—Hospital Ward. 20
Dressing Room, see Partitions—Toilet Shower, Dressing Room or Urinal .. 20
Fire Retardant 20
Folding—Fabric Covered and/or Sound Retarding 20
Folding—Wood 20
Folding—Wood—Sound Retarding .. 20
Hollow Metal—Rolled or Pressed .. 20
Hollow Metal—Sound Retarding ... 20
Hospital, see Screens—Hospital Ward 20
Interchangeable Adjustable—Metal . 20
Interchangeable Adjustable—Wood, Fiber Board, Asbestos Sheets, etc. . 20
Interchangeable—Open Mesh, see Partitions—Open Mesh 20
Interlocking Steel 9
Jail, see Jail—Construction and Equipment 21
Metal Covered, see Doors—Metal Covered 14
Metal Faced Plywood, see Panels—Metal Surfaced 10
Metal—Rolled or Pressed, see Partitions—Hollow Metal—Rolled or Pressed 20
Movable, see Partitions—Interchangeable 20
Open Mesh 20
Rolling, see Doors—Rolling 14
Sound Retardant, see Specific Type of Partition 20
Tile, see Tile—Hollow Clay or Terra Cotta; Tile Form—Hollow Gypsum—Partition 4
Toilet, Shower Dressing Room or Urinal—Metal 20
Toilet, Shower Dressing Room or Urinal—Phenolic Fiber 20
Toilet, Shower Dressing Room or Urinal—Porcelain Enameled 20
Toilet, Shower Dressing Room or Urinal—Soapstone 20
Toilet, Shower Dressing Room or Urinal—Structural Glass 20
Vertical Sliding—Electrically Operated 20
Wire, see Partitions—Open Mesh .. 20
X-Ray Protective 10

PASTE—SCHOOL
For Office, School, Home, etc. 21

PATCHING
Cement—Floor, see Flooring Cement—Patching for 11

PAVEMENT
Lights, see Vault—Sidewalk Lights for 7

PAVEMENTS
Asphalt Block, see Flooring—Asphalt—Brick or Block 11
Expansion Joints for, see Joints—Expansion—Concrete 3
Wood Block, see Flooring—Wood... 11

PAVING
Asphalt, see Flooring—Asphalt—Brick or Block 11
Breakers 1
Granite, see Granite—Paving Blocks. 4

PEDESTALS
Flag Pole, see Ornamental—Metal Work; Flag Pole—Bases 13
Statuary 13

PEELERS
Vegetable, see Kitchen—Vegetable Peelers 28

PENCIL
Lead 1

PENS
Live Stock 21

PERFORATED METAL
Concrete Reinforcement, see Lath—Expanded and/or Perforated Sheet. 3
Grilles, see Grilles and Screens 26
Lath, see Lath—Expanded and/or Perforated Metal Sheet 9

PERGOLAS
see
—Columns—Metal; Columns—Wood 8
—Furniture—Garden 21

PHENOLIC FIBER
Panels, see Panels—Phenolic Fiber.. 11

PHONOGRAPH
Radio Combination—Remote Control . 25

PICTURE
Mouldings, see Mouldings—Picture.. 9

PIGMENTS
see Paint—Pigments 17

PILASTER
Standards 28

PILASTERS
Metal, see Columns—Metal 8
Wood, see Columns—Wood 8

PILERS
See Elevators—Portable 21

PILES
Composite—Wood and Concrete ... 2
Concrete 2
Concrete Filled Cylinders or Tubes, see Piles—Steel Pipe or Sheet Metal Pipe—Concrete Filled 2
Sheet Metal Pipe—Concrete Filled, see Piles—Steel Pipe or Sheet Metal Pipe—Concrete Filled 2
Steel Pipe or Sheet Metal Pipe—Concrete Filled 2
Wood—Untreated and/or Creosoted . 2

PILING
Foundation, see Piles 2
Machines, see Elevators—Portable... 21
Sheet Steel, H and Z Section 2

PILOTS
Gas—Automatic 26

PINE
Flooring, see Flooring—Wood—Pine 11
Lumber, see Lumber—Pine 8

PIPE
Alignment Guides 26
Aluminum, see Tubes and Tubing .. 27
Asbestos—Cement 27
Bends 26
Brass or Copper 27
Casings, see Insulation—High Temperature 10
Cast Iron 27
Clamps—Joint or Straight Section .. 26
Coils, see Coils—Pipe 28
Conductor, see Conductors—Pipe... 6
Copper, see Pipe—Brass or Copper.. 27
Corrosion or Rust Resistant 27
Coverings, see Specific Type of Insulation 10

PIPE—Cont.
Drain—Acidproof 27
Drain—Acid Resistant 27
Drain—Packing for, see Packing—Drain Pipe 27
Drainage and Sewage—Culvert 27
Fittings, see Fittings—Pipe 27
Floor and Ceiling Plates, see Plates—Pipe—Floor and Ceiling 26
Hangers, see Hangers—Pipe 26
Insulation, see Insulation—Cold Storage; Insulation—High Temperature 10
Iron 27
Iron Wrought, see Pipe—Wrought Iron—Plain and/or Special Bending 27
Joint Compounds for Roof 6
Joints — Expansion — Heating, see Joints—Expansion 26
Joints — Expansion — Plumbing, see Joints—Pipe—Expansion—Acid Resistant 27
Joints—Expansion—Floor and Roof Drain, see Joints—Pipe—Expansion—Floor and Roof Drain 27
Nickel Silver 27
Prefabrication of 26
Railings, see Railings—Pipe 13
Seamless, see Specific Kind of Pipe .. 27
Sleeves 26
Steel—Copper Bearing 27
Steel—Welded 27
Steel—Wrought, see Pipe—Wrought Steel 27
Supports, see Hangers—Pipe 26
Support, Chairs, etc. 26
Underground Insulation, see Insulation—High Temperature 10
Ventilating—Acid Proof 27
Wrought Iron—Plain and/or Special Bending 27
Wrought Steel 27

PITCH
Roofing, Waterproofing, Paving, etc. .. 6
Including Steep Roofing

PIVOTS
Sash or Door 16

PLANES
Hand 1

PLANKS
Asphalt, see Flooring—Asphalt Plank 11
Concrete—Lightweight, see Slabs ... 3
Fiber, see Insulation—House—Board or Sheet Form 10
Gypsum, see Slabs Precast—Gypsum . 3
Wood—Treated, see Lumber—Creosoted or Treated 8

PLAQUES
Cast Metal, see Tablets 13

PLASTER
Acoustical 10
Asbestos, see Plaster—Gypsum—Prepared or Finishing 9
Bases, see Lath 9
Base—Insulating, see Insulation—House Blanket or Bat Form 10
Blocks, see Tile Form—Hollow—Gypsum 4
Board, see Lath; Wallboard—Gypsum 9
Bond 5
Bonding—for Concrete, see Plaster—Gypsum—for Use on Concrete ... 9
Casting and Moulding 9
Cement, see Plaster—Gypsum—Prepared or Finishing 9
Cement—Portland, see Cement—Portland 4
Exterior, see Stucco—Portland Cement 9
Fibered 9
Finishing, see Plaster—Gypsum—Prepared or Finishing; Lime; Plaster—Keene's Cement 9
Finishing—Colored 9
Gauging 9

PLASTER—Cont.
Glaze for 9
Gypsum—Calcined—Plaster of Paris . 9
Gypsum—For Use on Concrete 9
Gypsum—Patching, see Plaster—Patching 9
Gypsum—Prepared or Finishing 9
Hydrated Lime, see Lime—Hydrated . 9
Insulating, see Insulation—House—Powdered, Granular or Shredded .. 10
Keene's Cement 9
Lath, see Lath 9
Lime—Hydrated Finishing 9
Moth-repellant, see Closet—Lining Plastic 9
Moulding, see Plaster—Casting and Moulding 9
Patching 9
Portland Cement, see Cement—Portland 4
Sanded, see Plaster—Gypsum—Prepared or Finishing 9
Separators and Retainers, see Traps—Plaster, Sink, Hair and Sediment .. 27
Sound Absorbing, see Plaster—Acoustical 10
Texturing—Colored 9
Waterproofing, see Waterproofing—Paint and Compounds 5
Wood Fibered, see Plaster—Fibered .. 9
X-Ray Protective 10

PLASTERING SYSTEMS
See Partition Systems 9

PLASTIC
Acoustical, see Acoustical—Materials and Treatments; Plaster—Acoustical 10
Aluminum, see Paint—Aluminizing or Bronzing 17
Paint, see Paint—Texturing 17

PLATE
Glass, see Glass—Clear Sheet 18
Glass Mirrors, see Mirrors—Plate Glass 18
Warmers—Electric or Gas 28

PLATES
Door—Kick or Push 16
Electric Switch and Outlet Receptacle 23
Floor 11
Illuminating Glass, see —Glass—Obscuring and Diffusing Plates or Plaques 18
—Glassware—Illuminating 24
Iron or Steel, see Sheet Metal—Ingot—Iron 6
Isolation or Insulation of Vibrations, see Isolation—Machinery Vibration 10
Metal—For Building Directories, see Directories—Building 21
Name—Cast, see Ornamental—Metal Work; Tablets 13
Name—Metal—For Building Directories, see Ornamental — Metal Work; Tablets 13
Pipe—Floor and Ceiling 26
Sidewalk—Vault Light 13
Stair, see Treads—Safety 12
Wall Bearing—Metal 3

PLATFORMS
Disappearing — Show Window, see Windows — Show Disappearing — Platforms for 15
Loading Protection 13

PLAYGROUND
Apparatus 21

PLINTHS
Column, see Caps and Bases—Column 3
Tile, see Cove Base—Tile; Flooring—Rubber 11

PLUGS
Boiler Repair 16
Wall—For Concrete 3
Wall—For Plaster 9

PLUMBERS'
Brass Goods 27

PLUMBING WORK AND FIXTURES
Cocks and Bibbs, see Faucets 27
Faucets, see Faucets 27
Lavatory Fittings, see Lavatory—Fittings 27

PLYWOOD 8
Glue for, see Glue—for Fabricating Panels and Veneers 8
Metal Surfaced 8

PNEUMATIC DISPATCH TUBE SYSTEMS 21

POINTING
Cement or Compound, see Cement—Pointing; Caulking—Compounds .. 5

POKERS
Fireplace, see Fireplace—Accessories and Supplies 26

POLES
Flag, see Flag Poles 13
Metal 13
(Including: Contaper, Entasis Taper and Graduated)
Sliding—Fire Escape 21
Wood—Creosoted, see Lumber—Creosoted or Treated 8

POLISH
Gymnasium Floor, see Finish Gymnasium Floor—Non-slip 17
Floor and Furniture—Liquid 17
Wax—Floor—Paste or Liquid, see Wax—Floor—Paste or Liquid 17

POLISHING
Machines 17

PONTOONS
Steel 3

POOLS
Swimming, see Swimming Pool—Design and Construction 21

PORCELAIN
Brick, see Brick—Enameled 4
Enameled Metal, see Sheet Metal—Vitreous or Porcelain Enameled ... 13

PORCH
Boxes, see Boxes—Flower 21

PORTE COCHERE
Metal, see Marquises 13

PORTLAND
Cement, see Cement—Portland 4

PORTRAITS
Base—Relief 13

POST
Caps and Bases, see Caps and Bases—Post 3
Wood—Creosoted, see Lumber—Creosoted or Treated 8

POSTS
Mooring 13

POTS
Chimney, see Chimney—Caps and Pots—Clay or Terra Cotta 4

POTTERY
Garden 21

POULTRY HOUSE
Fittings and Fixtures 21

POWER
Transmission Equipment 26

PRECAST
Art Marble, see Art Marble 11
Stone, see Stone—Cast 4
Terrazzo, see Terrazzo 11

PRECIPITATORS
Dust—Electric 26

PREHEATERS
Feed Water, see Heaters—Feed Water 26
Fuel Oil, see Heaters—Oil—Fuel 26

PRESERVATION OF BUILDING EXTERIORS, see Restoration and Preservation—Building Exteriors..... 1

PRESERVATIVES
Cement Floor, see
—Hardeners and Densifiers—Cement and Concrete..... 5
—Oil—Floor Finishing—Cement, Magnesite, Terrazzo, etc..... 17
Fabric, Lines, Ropes, Fish Nets, etc... 8
Floor Finishing—Cement, Magnesite, Terrazzo, etc., see Oil—Floor Finishing—Cement, Magnesite, Terrazzo, etc. 17
Masonry, see
—Waterproofing—Paint and Compounds 5
—Paint—Brick, Cement, Concrete, Stucco, Stone 17
Metal, see Paint—Metal Protective.. 17
Shingle, see Stains—Shingle..... 17
Wood 8
Wood Floor..... 17

PRESSES
Clothes, see Ironing—Machines..... 28

PRESSURE
Indicators or Recorders, see Specific Products 26
Relieving—Structural Joints, see Joints—Structural—Pressure Relieving 3
Vessels, see Tanks—Pressure..... 27

PRIMERS
Concrete, see Fillers—Concrete..... 5
Wood and Metal, see Fillers; Paint; Sizing, etc..... 17

PRISON
Construction and Equipment, see Jail—Construction and Equipment... 21

PROGRAM
Clocks, Bells, etc., see Clock Systems. 25
Distribution Systems..... 25
(Radio Receivers and Reproducer Sets for use in these Systems)

PROJECTORS
Electric — Theater — Scenic Effects, etc. 24
Floodlighting, see Floodlights..... 24
Spotlight, see Spotlights..... 24

PROMENADE DECK COVERING
See Floor Construction—Light Weight 3

PROSCENIUM
Lights, see Stage Fittings and Lighting—Electrical 24

PROTECTED
Steel, see Sheet Metal—Steel Asbestos Covered 6

PROTECTIVE
Coatings or Compounds—Steel, Concrete, etc., see
—Waterproofing—Paint and Compounds 5
—Paint 17
Devices—Bank, Office, etc.—Gas... 21

PROTECTORS
Conductor and Sewer Pipe, see Shoes—Leader 6

PUBLIC ADDRESS
Systems 25

PULLEYS
Sash—Cast Iron 16
Sash—Overhead 16
Sash—Pressed Steel 16

PULL-OUT
Garment Carriers, see Garment—Carrier Equipment 16

PULPITS
Wood, Metal, Marble, etc., see Ecclesiastical Furniture and Accessories. 21

PUMPING
Sets 27

PUMPS
Bilge 27
Boiler Feed, see Specific Type of Pumps 27
Booster, see Specific Type of Pumps. 27
Centrifugal 27
Contractors, see Pumping Sets..... 27
Deep Well—Plunger 27
Deep Well—Turbine 27
Fire Protection or Underwriters..... 27
Fuel Oil, see Burners—Oil and/or Equipment 26
Hand 27
Hot Water Circulating—Heating System, see Heating Systems—Hot Water—Circulators for..... 26
House or Tank—Water Supply, see Pumps—Centrifugal; Pumps—Power; Pumps—Rotary; Pumping Sets 27
Plunger, see Pumps—Deep Well Plunger; Pumps—Power..... 27
Power 27
Refrigeration, see Refrigerating—Machinery and Equipment; Ice Making—Machinery and Plants..... 28
Sewage Disposal, see Pumps—Bilge; Ejectors—Sewage 27
Shallow Well..... 27
Special 27
(Others than Steam, Air, Gas, Oil Fuel, Oil and Water)
Spray 27
Sump, see Pumps—Bilge; Ejectors—Sewage 27
Turbine 27
Vacuum 26
Water Supply Systems, see Water—Supply Systems—Hydro-pneumatic or Storage..... 27

PUMPS AND RECEIVERS
Condensation 26

PURIFIERS
Air, Gas, Steam or Liquids, see Specific Products as: Filters, Washers, etc. 26

PUSH BUTTONS
Electric—Bells, Buzzers, etc...... 25

PUTTY
Acid Resistant..... 18
Cold Water..... 17
Metal Sash..... 18
Plumbing Fixtures, see Plumbing Work and Fixtures—Setting Compounds for..... 27
Stove or Boiler..... 18
Wood Sash..... 18

Q

QUICK SETTING
Cement and Concrete, see Accelerators 5

R

RACEWAY
Surface and/or Overfloor
See Conduit — Electrical — Metal Moulding or Raceway 23

RACKS
Barrel Storage..... 28
Basket 21
Bottle, see Bottle—Racks..... 28
Check Room, see Check Room Equipment 21
Display School, see Blackboard—Display—Rails or Racks..... 21
Gymnasium, see Lockers—Steel..... 21
Hat and Coat..... 21
Hay 21
Magazine 21

RACKS—Cont.
Mortuary, see Mortuary—Racks..... 28
Refrigerator or Cold Storage, see Refrigerators—Shelving 28
Rug—Cold Storage..... 28
Theater Booth, see Ticket—Booth and Equipment—Theater 21
Telephone Book 21
Tie 16
Towel, see Bathroom Accessories—Towel Bars or Racks, Grab Rails, etc. 27
Wine, see Wine—Racks..... 28

RACKS OR REELS
Fire Hose, see Fire—Racks and Reels. 21

RADIATOR
Covers and Cabinets..... 26
Grilles, see Grilles and Screens; Radiator—Covers and Cabinets..... 26
Hangers, see Hangers—Radiators.... 26
Metering Orifices..... 26
Shields, see Radiators—Covers and Cabinets 26
Tops, see Specific Product..... 26
Traps, see Traps—Radiator..... 26
Valves, see Valves—Radiator Supply.. 26

RADIATORS
Cabinet—Steam or Hot Water..... 26
Cast Iron—Steam or Hot Water.... 26
Concealed—Steam or Hot Water.... 26
Convector Type..... 26
Electric, see Heaters—Radiator—Electric 26
Gas, see Heaters—Radiator Gas..... 26
Humidifying, see Humidifiers—Air; Air Conditioning..... 26

RADIO
Cabinets—Plywood, see Plywood.... 8
Caps—Outlet 23
Control—Remote 25
Frequency Distribution Systems..... 23
Masts, see Structural—Steel Fabricators, Designers and Welders..... 3
—Flag Poles..... 13
Metal Box Divider Outlet..... 23
Outlets for Antenna, Ground, etc..... 23
Phonograph Combination — Remote Control 25
Poles—Steel Tubular..... 13
Receivers, see Program—Distribution Systems 25
Sets 25
Speakers, see Public Address System. 25
Wiring Devices..... 23

RADIUM
Protective Materials..... 10

RAGGLE
Blocks, see Flashing—Blocks, Forms, Receivers, etc..... 6

RAILINGS
Balcony, etc., see Ornamental—Metal Work; Railings—Metal..... 13
—Fences and Fencing—Iron..... 21
Metal 13
Metal Panel, see Partitions..... 20
Pipe 13
Pipe—Fittings for..... 13
Steel Panel, see Partitions..... 20
Wire, see Partitions—Open Mesh... 20
Wood 8
Wood Panel, see Partitions..... 20

RAILS
Altar, see Railings—Metal..... 13
Chair—Metal, Fiber, Rubber, Wood, etc. 11
Display — School, see Blackboard—Display Rails or Racks..... 21
Hand—Metal 13
Hand—Terra Cotta..... 4
Stair, see Railings—Metal..... 13

RAILWAYS
Incline 22

INDEX TO SECTIONS

RANGE
Boilers, see Boilers—Range 27
Boiler—Heater Combination, see Heaters—Water 27

RANGES
Baking, see Ovens—Baking 28
Electric—Commercial 28
Electric—Domestic 28
French—Electric, Coal, Gas or Oil . . . 28
Gas or Electric—Kitchen Cabinet Combination 28

RECEIVERS
Condensation—Alternating, see Traps—Steam and Return Steam 26
Condensation and Air Pumps, see Pumps and Receivers—Condensation 26
Garbage—Built-In 28
Garbage—Underground 28
Milk Bottle and Package 28

RECEPTACLES
Waste, see Waste—Receptacles 28

RECEPTACLES—ELECTRIC
Brackets and Ceiling Fixtures, see Lighting Fixtures—Electric 24
Convenience Outlets 23
Convenience Outlets—Standard T-Slot 23
Convenience Outlets and Switch Combined 23
Outlet Box 23
Plug and Fan Hanger—Combination, see Boxes—Outlet—Electric Clock or Fan Hanger 23
Plug, Pilot Lamp, Night Light, etc. . . . 23
Radio Outlets 23
Range and Accessories 23
Remote Control 23
Socket, see Sockets—Electric 23
Stage, see Stage—Fittings and Lighting—Electrical 24
Switch Combination, see Receptacles—Electric—Convenience Outlet and Switch Combined 23

RECEPTORS
Shower Bath 27

RECLAIMERS
Water Heating, see Heat—Exchangers, Interchangers, Economizers, etc. 26

RECORDERS
CO_2 26
Temperature, see Thermometers—Indicating and Recording 26
Time—Delay Period—Electric 21
Time—Watchman's, see Clock Systems—Watchman's 25

RECREATION
Equipment, see Specific Product as: Grandstands; Swimming Pool Equipment; Play Ground Equipment, etc. 21

RED
Lead, see Lead—Red 17

REELS
Barbed Wire 21

REFLECTORS—LIGHTING
Aisle Lighting—Bookstack 24
Aisle Lighting—Theater 24
Bank Screen, Showcase, Window, Church, Concealed, etc., see Lighting Fixtures—Electric—Bank, Screen, Showcase 24
Cove Lighting, see Lighting Fixtures—Electric—Bank, Screen, Showcase, Window, Church, Concealed, etc. . 24
Exterior, see Floodlights; Spotlights; Lighting Fixtures—Electric 24
Floodlighting, see Floodlights 24
Gasproof, Vaporproof, Weatherproof, etc. 24
Industrial 24
Inkstand—Combination 24
Metal, Porcelain Enameled, etc. 24

REFLECTORS—LIGHTING—Cont.
Plant, Factory, etc., see Reflectors—Lighting—Industrial 24
Picture, see Art Gallery Fittings 21
Spotlight, see Spotlights 24

REFRACTORY
Brick, Clay, Cement, etc. 10

REFRIGERATING
Air Conditioning, see Coolers—Unit . 26
Cooler Units, see Coolers—Unit 26
Machinery and Equipment 28
Water Vapor System 26

REFRIGERATING SYSTEMS
Drinking Water, see Coolers—Drinking Water 27

REFRIGERATING AND VENTILATING
Systems, see
—Blowers; Fans; Ventilating—Systems; Coolers—Unit 26
—Refrigerating—Machinery and Equipment 28

REFRIGERATORS
Back-room, see Refrigerators—Commercial 28
Bakers', see Refrigerators—Commercial 28
Brine Pumps for, see
—Refrigerating—Machinery and Equipment 28
—Specific Type of Pump 27
Commercial—Florist, Hospital, Bakery, etc. 28
Doors for, see Doors—Cold Storage or Refrigerator 28
Electric 28
Florist, see Refrigerators—Commercial 28
Front Work for 28
Hospital, see Refrigerators—Commercial 28
Insulation for, see Insulation—Cold Storage or Refrigeration 10
Kitchen, see Refrigerators—Electric . 28
Kitchen Cabinet Combination 28
Mortuary 28
Shelving for 28
Storage, see Refrigerators—Commercial 28
Trucks 28
Walk-in, see Refrigerators—Commercial 28
Windows for 28

REGISTER
Faces, see Grilles and Screens 26
Shields 26

REGISTERING
Devices—Turnstiles, see Turnstiles . . 21

REGISTERS
Heating, Ventilating or Air Conditioning, see Dampers or Registers; Grilles and Screens 26
Heating and Ventilating—Louver Type, see Louver—Air Conditioning and/or Ventilating 26
High Velocity Air Diffuser 26
Metal Frames for 26
Revolution or Operation, see Counters—Revolution or Operation 21

REGISTERS OR DAMPERS
Controlled Intakes or Outlets, see Dampers and/or Registers 26

REGULATORS
Air Conditioning, see Controls—Air Conditioning 26
Damper 26
Feed Water 26
Heat, see Controllers—Temperature; Thermostats 26
Humidity, see Controllers—Humidity; Humidostats 26
Pressure, see Controllers—Pressure—Automatic; Valves—Reducing or Regulating Pressure 26
Swimming Pool—Sterilization 21
Temperature, see Controllers—Temperature; Thermostats 26

REINFORCEMENT
Beam or Column Wrappers, see Caging—Wire Beam, Girder or Column . . 3
Concrete, see Bars—Reinforcing; Concrete Reinforcement—Expanded and/or Perforated Sheet 3

REINFORCING
Devices, see Clips—Bar Concrete—Reinforcing 3

RELAYS
Electric 23

REMOTE CONTROL
Apparatus—Door Operating 16
Apparatus—Electrical 23
Apparatus—Heating or Air Conditioning 26
Apparatus—Radio, see Radio 25

REPRODUCERS
Sets, see Program—Distribution Systems 25
Voice and Music, see Public Address—Systems; Program—Distribution—Systems; Radio Frequency Distribution Systems 25

RESERVOIRS
See Tanks 27

RESTAURANT AND CAFETERIA
Equipment, see Furnishings and Equipment—Cafeteria and Restaurant . . 28

RESTORATION AND PRESERVATION
Building Exteriors 1

REVOLVING
Doors, see Doors—Revolving 14

RHEOSTATS
Electric 23

RIDGE ROLLS OR STRIPS
Metal 6
Prepared or Ready—Plain or Surfaced, see Roofing—Roll—Prepared or Ready—Plain or Surfaced 6

RIGGING
Stage 21

RINGS
Curtain—Bedside, Hospital, Screening, Shower, see Curtains—Hooks for . . 20

RIPRAP
Granite, see Granite 4

RISERS
Art Marble, see Treads and Risers—Art—Marble 11

RIVET
Bolt 3

ROBE
Hooks, see Bathroom Accessories 27

ROCK
Wool, see Insulation—House 10

RODS
Lightning, see Lightning—Rods 23
Picture 13
Shower Curtain, see Curtains—Shower—Rods for 27

RODS AND BARS
Aluminum 13
Brass, Bronze, Copper or Nickel Silver 13
Reinforcing—Concrete, see Bars—Concrete Reinforcement 3
Stainless Steel 13
Welding, see Welding—Filler Metal . 1
Wrought Iron 13

ROLLERS
Awning, see Awnings—Rollers and/or Operating Mechanisms for 16
Door, see Sheaves—Sliding Door; Hangers—Door 16
Window Shade, see Shades—Window—Rollers for 16

ROLLING
- **Blinds,** see Blinds—Rolling—Outside. 16
- **Doors,** see Doors—Rolling—Wood, Doors Rolling—Steel. 14
- **Partitions,** see Doors—Rolling. 14
- **Window Screens,** see Screens—Insect —Rolling 16

ROLLS
- **Pipe,** see Hangers—Pipe. 26

ROOF
- **Awning Sockets,** see Awnings—Roof. 16
- **Decks,** see Roof Construction. 3
- **Drains,** see Drains—Roof, Gutter or Promenade 27
- **Flashing,** see Flashings—Sheet Metal. 6
- **Insulation,** see
  - —Insulation House 10
  - —Roof Construction—Gypsum. . . . 3
  - —Tile—Roofing—Gypsum 6
  - —Paper and Felts. 6
- **Lights,** see Vaults—Sidewalk Lights for; Skylights—Glass, Concrete and Steel Construction. 7
- **Planks—Treated,** see Lumber—Creosoted or Treated. 8
- **Repairing Material—Mastic,** see Cement—Roofing 6
- **Snow Guards,** see Guards—Snow. . . . 6
- **Strainers,** see Strainers—Roof. 27
- **Sumps,** see Drains—Roof, Gutter or Promenade 27
- **Tile,** see Tile—Roofing. 6
- **Trusses,** see Trusses—Arch Construction 3
- **Ventilators,** see Ventilators—Roof. . . 7

ROOF CONSTRUCTION
- **Batten—Extruded Metal**. 6
- **Concrete Reinforced and Slag Concrete Block**. 3
- **Concrete T-Beam and Metal Forms,** see Floor Construction. 3
- **Expansion Joints for,** see Joints—Expansion—Concrete 3
- **Glass and Concrete or Steel Construction,** see Specific Type of Skylight, as: Skylights—Glass and Concrete or Steel Construction. 7
- **Gypsum—Slab or Tile Form**. 3
- **Lightweight Slab**. 3
- **Metal Sheet—Insulated**. 3
- **Precast Tile,** see Slabs—Precast—Gypsum 3
- **Rotating, Folding, Sliding, etc.**. 3
- **Skylights,** see Skylights. 7
- **Steel Deck—Insulated,** see Roof Construction—Metal Sheet—Insulated 3
- **Steel Truss and Joist**. 3
- **Sub—Nailing Concrete,** see Nailing Concrete 3
- **Transparent or Daylight,** see Skylights—Glass, Concrete or Steel Construction 7
- **Trusses for,** see Trusses. 3
- **Trussless (Patented),** see Trusses—Arch Construction 3

ROOFING
- **Asbestos—Cement—Plain or Corrugated** 6
- **Asphalt,** see Roofing—Built-up Felt and Fabric; Shingles—Asphalt Asbestos 6
  - —Flooring — Asphalt Block or Brick; Flooring — Asphalt Tile Form 11
- **Built-up—Felt and Fabric**. 6
- **Built-up—Metal** 6
- **Canvas,** see Canvas. 6
- **Cement,** see Cement—Roofing. 6
- **Contractors,** see Contractors — Roof Construction 6
- **Copper** 6
- **Corrugated — Asbestos-Cement Covered Metal,** see Roofing—Asbestos-Cement Plain or Corrugated. . . 6

ROOFING—Cont.
- **Daylight,** see Skylights—Glass, Concrete and Steel Construction. 7
- **Felt,** see Roofing—Built-up—Felt and Fabric; Roofing — Roll — Prepared or Ready; Felt-Roofing. 6
- **Glass,** see Glass—Corrugated. 18
- **Ingot Iron—Corrugated, Roll, Standing Seam and V-Crimp**. 6
- **Iron, Copper Alloyed, Galvanized—Flat, Corrugated, Beaded, etc.**. . . . 6
- **Lead Coated** 6
- **Paper,** see Paper or Felts—Building. . 6
- **Roll—Prepared or Ready—Plain or Surfaced** 6
- **Roll—Sheet Metal**. 6
- **Seam and V-Crimp**. 6
- **Shingles,** see Shingles—Specific Type 6
- **Slate,** see Shingles—Slate. 6
- **"Specifications,"** see Roofing—Built-up 6
- **Steel, Asbestos Covered—Flat, Corrugated, Beaded** 6
- **Steel, Copper Alloyed—Flat, Corrugated, Beaded, Formed, V-Crimp, etc.** 6
- **Steel—Plain, Galvanized, Black or Painted—Corrugated, V-Crimp, Beaded, etc.** 6
- **Tar and Gravel,** see Roofing—Built-up —Felt and Fabric. 6
- **Tile,** see Tile Form—Roofing. 3
- **Tin and Terne Plate**. 6
- **Transparent,** see Skylights—Glass, Concrete or Steel Construction. . . 7
- **Wrought Iron** 6

ROOFS
- **Constructed,** see Roof Construction. . 3

ROOM
- **Coolers,** see Coolers; Air Conditioning 26

ROPE
- **Fittings—Wire,** see Rope—Wire. . . . 22

ROT
- **Dry and Wet Preventatives**. 8

RUBBISH
- **Burners,** see Burners. 28
- **Chutes,** see Chutes—Garbage or Waste 28

RUG
- **Storage Racks,** see Racks—Rug—Cold Storage 28

RUGS AND CARPETS
- **Domestic** 11
- **Felt Base**. 11

RUSTIC FENCING, see Fences and Fencing—Wood and/or Woven Wood. 21

S

SADDLE
- **Racks** 21

SADDLES
- **Beam,** see Concrete — Reinforcing Devices 3
- **Door—Metal,** see Thresholds and Saddles—Metal 19
- **Thresholds and Saddles—Safety**. . . . 12
- **Door—Rubber,** see Flooring—Rubber 11

SAFE DEPOSIT BOXES, see Boxes—Safe Deposit 21

SAFES
- **Anti-holdup Cash Counter Drawers,** see Cash Drawers. 21
- **Fire-resistive—Light Weight** 21
- **Fire-resistive—Portable, Wall, etc.**. . 21
- **Night Depository** 21
- **Plan,** see Cabinets—Blue Print and Plan Filing 21

SAFETY DEVICES
- **Non-slip Treads,** see Treads—Safety; Treads and Nosings—Safety; Ladder Shoes—Safety 12
- **Window Cleaner's Belts,** see Window —Cleaners' Safety Devices 16

SANDBLASTING, see Cleaning—Building Exteriors 1

SANDING
- **Machines** 17

SANDSTONE
- **Artificial,** see Stucco—Portland Cement—Colored—Premixed 9
- **Ashlar** 4
- **Flagging,** see Flagging—Sandstone. . 11
- **Natural** 4

SANITARY
- **Systems,** see Septic—Tanks; Sewage Disposal Systems 27

SASH 15
- **Balances,** see Balances—Sash. 16
- **Casement,** see Window—Casement 15
- **Ceiling Lights**. 7
- **Centers or Pivots,** see Pivots—Sash or Door 16
- **Chain,** see Chain—Sash 16
- **Cord,** see Cord—Sash. 16
- **Double Glazing,** see Windows—Double Glazing 15
- **Monitor,** see Window—Continuous. . 15
- **Operating Devices,** see Operators—Sash 16
- **Pulleys,** see Pulleys—Sash. 16
- **Steel,** see Windows—Steel; also Specific Type of Window. 15
- **Store Front,** see Store Front—Construction—Metal 19
- **Storm** 15
- **Turret,** see Windows—Continuous. . 15
- **Wood,** see Windows—Wood. 15

SCAGLIOLA 9

SCHOOL
- **Display Rails or Racks,** see Blackboard—Display Rails or Racks. . . . 21
- **Furnishings and Equipment,** see Furnishings and Equipment — Vocational 21

SCOURING
- **Powder,** see Cleaners, Polishers and Preservatives; Soap—Floor Cleaning 17

SCREEDS
- **Base,** see Base—Screeds or Grounds—Metal 9
- **Base—Plastic,** see Base, Screeds or Grounds—Plastic 11

SCREEN CLOTH 16

SCREENING—WARD, see Partitions—Cubicle 20

SCREENS
- **Bank and Counter**. 20
- **Color for Lamps**. 24
- **Fireplace,** see Fireplaces — Accessories—Andirons, Screens, Grates, etc. 26
- **Heating, Ventilating or Air Conditioning,** see Grilles and Screens. 26
- **Hospital Ward** 20
- **Insect—Casement Window,** see Specific Type of Screen—Insect. 16
- **Insect—Frameless** 16
- **Insect—Metal Frame** 16
- **Insect—Pivoted Steel Window**. 16
- **Insect—Projected In or Out—Steel Window** 16
- **Insect—Rolling** 16
- **Insect—Wood Frame** 16
- **Perforated Metal,** see Grilles and Screens 26
- **Smoke,** see Partitions. 20

INDEX TO SECTIONS

SCREENS—Cont.
Ventilating, see Grilles and Screens—Heating, Ventilating or Air Conditioning 26
Wire Enclosures, see Partitions—Open Mesh 20

SCREENS AND FRAMES
Motion and Talking Pictures 21

SCREENS—ROLLING CURTAIN AND FOLDING
Fireplace, see Fireplace—Accessories—Andirons, Screens, Gates, etc... 26

SCREW
Anchors, see Anchors—Screw—Concrete, Plaster, etc..... 16

SCREWS
Lag 16
Machine 16

SCRUBBERS
Gas 3

SCRUBBING
Machines 17

SCUPPERS
Metal 27

SEALERS
Fillers, Paint, etc., see Fillers; Paint; Sizing, etc. 17
Floor 17

SEALS
Cast Metal, see Tablets..... 13

SEATING
Portable 21

SEAT AND PEW
Backs—Plywood 8

SEATS
Stadium, see Bleachers—Seating.... 21
Theater, Assembly Hall, etc., see Chairs—Theater, Assembly Hall, etc. 21
Water Closet, see Closet—Seats.... 27

SEE SAW
Boards 21

SEPARATORS
Air—Dust and Loose Flowing Materials 26
Grease, Oil and Refuse..... 27
Plaster Retainer Combination, see Traps—Plaster—Sink, Hair and Sediment, Dental, Surgical..... 27
Reinforcing Steel, see Clips—Bar—Concrete Reinforcement..... 3
Steam 26

SEPTIC
Tanks 27
Tanks—Syphon Compartment 27

SERVICE UNITS
Beer, Liquor, etc...... 28

SETTEES
Garden, see Furniture—Garden..... 21

SEWAGE
Disposal Systems 27
Ejectors, see Ejectors—Sewage..... 27
Purification Apparatus, see Sewage—Disposal Systems 27

SHADES
Glassware for Lighting Fixtures, see Glassware—Illuminating 24
Light Arresters for..... 16
Lightproof 16
Lightproof—Motor Operated 16
Skylight, see Skylights—Shades..... 16
Window—Adjustable 16
Window—Brackets for 16
Window—Cloth or Fabric for..... 16
Window—Lightproof, see Shades—Lightproof 16
Window—Rollers for 16

SHADES—Cont.
Window—Skylight, etc.—Ventilating 16
Window—Washable Fabric 16
Window—Wood Fabric 16
X-Ray 16

SHAKES
Shingle, see Shingle—Shakes..... 6

SHAPES
Furring, see Channels—Furring, Studding, etc. 9
Non-structural, see Extruded and/or Drawn—Metal Shapes; Ornamental—Metal Work 13
Non-Structural—Lightweight Framing 3
Structural 3

SHAPES AND TRIMMINGS
Tile, see Tile..... 11

SHEATHING
Asbestos—Plain or Corrugated, see—Insulation—House—Board or Sheet Form 10
—Wall Board—Asbestos-Cement. 11

SHEATHING OR SIDING MATERIAL, see
—Insulation—House; Wall Board—Fiber 10
—Lath—Gypsum 9
—Paper and Felts—Building..... 6
—Plywood 8
—Siding 6
—Wall Board—Gypsum 9

SHEAVES
Sliding Door 16

SHEET METAL
Annealed and Black Sheets—Flat and Corrugated 6
Asbestos Covered, see Sheet Metal—Steel Asbestos Covered—Flat, Corrugated, Beaded, etc..... 6
Bonded with Felt, Fabric, etc., see Sheet Metal—Steel—Fabric Surfaced 10
Copper—Enameled 13
Copper—Lead Coated, see Sheet Metal—Lead Coated 6
Expanded—for Partitions, Guards, Grilles, etc...... 20
Expanded—Lath, see Lath—Expanded and/ or Perforated Metal Sheet... 9
Fasteners—Corrugated Metal, see Fasteners—Corrugated—Metal ... 6
Ingot Iron—Galvanized, Blue Annealed—Flat and Corrugated.... 6
Ingot Iron—Galvanized, Blue Annealed—Flat or Corrugated—Primed for Painting..... 6
Iron, Copper Alloyed—Galvanized—Flat, Corrugated, Beaded, etc..... 6
Lead Coated 6
Perforated—Concrete Reinforcement, see Concrete Reinforcement—Expanded and/or Perforated—Metal Sheet 3
Sign Letters, see Letters—Metal... 13
—Letters—Wood 8
Steel and Asbestos—Copper Covered 6
Steel—Asbestos Covered—Flat, Corrugated, Beaded, etc. 6
Steel—Copper Alloyed—Flat, Galvanized, Corrugated, Beaded, Formed, etc. 6
Steel—Copper Alloyed—Galvanized—Flat, Corrugated or Beaded for Painting 6
Steel—Fabric or Felt Surfaced..... 10
Steel—Galvanized or Black—Flat, Corrugated, Beaded, Formed, etc.. 6
Steel—Non-metallic Backing 13
Steel—Sound Deadened 10
Tin and Terne Plate..... 13
Vitreous or Porcelain Enameled..... 13
Wrought Iron 13

SHEET METAL WORK
General 6

SHEETS
Enameling, see Sheet Metal—Copper Enameled 13
Metal Foil for Insulation, see Insulation—House—Reflective—Aluminum Foil Covered..... 10
Metal—Porcelain Enameled 13
Phenolic Fiber, see Panels—Phenolic Fiber 11

SHELL
Roof Construction, see Arch—Roof Construction 3

SHELLAC AND SHELLAC SUBSTITUES. 17

SHELVING
Adjustable—Hardware for, see Hardware—Shelving 16
Facing Material, see Specific Material 11
Glass 18
Mouldings, see Mouldings..... 11
Refrigerator or Cold Storage, see Refrigerators—Shelving 28
Steel 21
Steel—Library, see Shelving—Steel; Book-Stacks 21
Steel—Roller 21
Wire 21
Wood—Library, see Book—Stacks.. 21

SHIELDS
Bathtub—for Showers 27
Expansion, see—Bolts—Expansion; Anchors—Screw—Concrete, Plaster 16
Radiator, see Radiator—Covers and Cabinets 26

SHINGLE
Stains, see Stains—Shingle..... 17

SHINGLES
Asbestos-Cement 6
Asphalt—Cork Insulated 6
Asphalt—Plain or Mineral Surfaced—Individual or Strip..... 6
Cement 6
Glass, see Glass—Structural 11
Metal 6
Shakes 6
Slate 6
Tile, see Tile—Roofing..... 6
Wood—Hand Split 6
Wood—Sawed—Natural or Colored. 6

SHOCK ABSORBERS
Waterhammer 27

SHOE
Racks and Cabinets 16

SHOES
Ladder, see Ladder Shoes—Safety... 12
Leader 6

SHOWER BATH
Compartments, see Cabinets—Shower Bath 27
Domes—Aerating—for Swimming Pools 27
Doors, see Doors—Shower Stall—Glass 27
Drains, see Drains—Floor, Yard, etc.; Drains—Double Drainage 27
Fixtures, see Baths—Shower or Needle 27
Lights, see Lighting Fixtures—Electric—Gasproof, Vaporproof, Weatherproof, etc. 24
Mixers, see Valves—Mixing..... 27
Partitions, see—Partitions—Toilet, Shower Dressing Room or Urinal..... 20
—Cabinets—Shower Bath 27
Receptors, see Receptors—Shower Bath 27
Shields, see Shields—Bathtub—for Showers 27

SHOWER BATH—Cont.
Stalls, see
—Partitions—Toilet, Shower Dressing Room or Urinal 20
—Cabinets—Shower Bath 27

SHOWERS
Dressing Room Combination 27
Street and Playground 27

SHOWCASE
Brackets, see Brackets—Showcase ... 16

SHOW WINDOW
Disappearing Platforms for, see Windows—Show 15

SHUTTER
Holders, see Fasteners 16

SHUTTERS
Automatic—Picture Booth 14
Automatic Sliding Pole 21
Fan—Ventilating or Exhaust 26
Lightproof, see Shades—Lightproof. 16
Metal Covered, see Doors—Metal Covered 14
Rolling, see Doors—Rolling—Metal.. 14
Sheet Steel, see Doors—Sheet Metal. 14
Steel or Iron, see Doors—Sheet Metal; Doors—Rolling—Metal 14
Tin Clad, see Doors—Metal Covered. 14
Ventilating, see Louvers — Door — Ventilating 16
Ventilating Wall, see Ventilators—Wall for Brick, Concrete, Glass or Frame Construction 7
Wood, see Blinds—Venetian—Wood —Outside 16

SIAMESE
Hose Connections 21

SIDEWALK
Doors, see Doors—Sidewalk—Vault Light 7
Gratings, see Gratings—Sidewalk, Area, etc. 11
Lights, see Vaults—Sidewalk Lights for 7

SIDEWALLS
Glass, see Glass—Corrugated; Glass —Wire 18

SIDING
Asbestos-Cement 6
Asphalt—Plain or Mineral Surfaced .. 6
Lumber, see Lumber 8
Roll or Strip—Prepared or Ready, see Shingles; Asphalt—Plain or Mineral Surfaced—Individual or Strip; Roofing—Roll—Prepared or Ready —Plain or Surfaced 6
Sheet Metal, see Sheet Metal 6
Shingles, see Shingles 6
Steel—Fabric Surfaced, see Sheet Metal—Steel—Fabric Surfaced ... 10
Wood 6

SIGNAL SYSTEMS—ELECTRIC
Bank and Vault Alarm, see Alarms—Burglar 25
Bells and Buzzers, see Bells and Buzzers—Electric 25
Burglar, see Alarms—Burglar 25
Carriage Calling 25
Code, see
—Signal Systems—Electric—Telephone and/or or Signal Combination 25
Elevator or Dumbwaiter 22
Elevator—Dispatching 22
Fire Alarm, see Alarms—Fire 25
General, see Bells and Buzzers—Electric 25
Hospital 25
Light 25
Nurses, see Signal Systems—Electric —Hospital 25
Police Calling 25
Rate of Rise—Automatic 26

SIGNAL SYSTEMS—ELECTRIC—Cont.
Sounding Devices for—Pneumatic, see Bells and Buzzers—Electric; Horns 25
Sprinkler Supervisory Service, see Sprinkler System — Supervisory Service 21
Tank Alarm 25
Telephone and/or Signal Combination 25

SIGNS
Exit, see Exit—Signs 24
Cast, Stainless Steel, Vitreous and/or Porcelain Enameled Metal 13
Illuminated—Electric—Interior or Exterior 24
Lighting Units for, see Reflectors—Lighting 24
Metal, see Tablets; Letters—Metal; Ornamental—Metal Work 13
Metal Letter, see Letters—Metal 13
Phenolic Fiber, see Panels—Phenolic Fiber 11
Porcelain Enameled, see Sheet Metal —Vitreous or Porcelain Enameled. 13
Window-Metal 13
Wire 20

SILLS
Art Marble, see Art—Marble 11
Door, see
—Flooring—Rubber 11
—Thresholds and Saddles—Metal. 13
Metal, see Extruded or Drawn Metal Shapes 13
Slate, see Slate—Structural 11
Stone, see Specific Type of Stone, as: Bluestone; Granite; Marble; Stone —Soapstone 4
Window—Aluminum 15
Window—Phenolic Fiber 15

SINK
Bowls 28
Outlet—Strainers—Acid Resistant .. 27
Strainers, see Strainers—Sink 28

SINKS
Chrome Nickel Iron Alloy 28
Dishwasher Combination 28
Enclosures for, see Cabinets; Kitchen-Units—Steel or Wood; Sinks—Kitchen Cabinet Combination 28
Garbage Disposal Combination 28
Kitchen Cabinet Combination—Porcelain Enameled, Nickel Copper Alloy, Stainless Steel and Linoleum 28
Laboratory—Acid Proof 27
Laboratory—Acid Resistant 27
Linoleum—Composition 28
Nickel Copper Alloy 28
Porcelain Enameled and Vitreous China—Kitchen, Pantry, Slop, etc. 28
Sheet Metal—Kitchen, Scullery, etc. . 28
Stainless Steel 28
Tops for, see Tops—Sink 28
Wood and Wood Fiber 28

SIPHONS
Sewage—Automatic 27

SIZING 17

SKIP
Hoists, see Hoists—Skip 22

SKYLIGHT
Curbs—Steel 7
Ceiling Light Sash 7
Moulding—Vibration Isolation 7
Tennis Courts 21

SKYLIGHTS
Aluminum 7
Contractors for 7
Corrugated Wire Glass 7
Glass, Concrete or Steel Construction 7
Guards for, see Grilles and Guards—Door Floor and Window 20
Insulated, see Skylights—Heat and Glare Retarding 7

SKYLIGHTS—Cont.
Puttied, see Skylights—Sheet Metal and/or Structural 7
Puttyless 7
Sash 15
Sash Operating Devices for, see Operators—Sash 16
Semi-Vacuum 7
Shades or Screens for 16
Sheet Metal and/or Structural 7
Stationary, see Skylights—Glass, Concrete or Steel Construction 7
Ventilating, see Ventilators — Skylights 7
Wire Glass 7
Wood Slat Shades for, see Blinds—Venetian 16

SLABS
Art Marble, see Art—Marble 11
Concrete—Light Weight, see Concrete—Lightweight 3
Insulating, see Insulation—House—Concrete 10
Ready Mixed or Precast 3
Metal Covered—Concrete Stone, see Stone—Concrete 4
Nailing Concrete, see Nailing—Concrete 3
Partition—Light Weight Concrete, see Concrete—Light Weight 3
Precast—Concrete, see Tile—Form—Roofing—Reinforced Cement 6
Precast—Gypsum 3
Reinforced Cement or Concrete Tile, see
—Floor Construction—Concrete—Reinforced—Flat Slab 3
—Tile—Form—Roofing 6
Sheet Metal—Roof, see Roof Construction—Metal Sheet 3
Soapstone, see Soapstone 4
Structural Glass, see Glass—Structural 11
Structural Slate 11
Terrazzo, see Terrazzo—Pre-cast ... 11

SLAG
Concrete Filler Tile, see Concrete ... 3

SLATE
Flagging, see
—Flagging—Slate 11
Flooring, see Flooring—Slate 11
Plumbing, see Slate—Structural 11
Roofing, see Shingles—Slate 6
Sanitary, see Slate—Structural 11
Structural 11
Structural—Permanently Finished in White and Colors 11

SLEEPERS—FLOOR
Anchors for, see Clips—Floor Sleepers 3

SLEEVES
Anchoring Bolt 16
Flashing—Vent Stack, see Vent Connections—Roof 6
Pipe, see Pipe—Sleeves 26

SLIDES
Drawer, see Drawer—Slides 16
Water 21

SLIDING
Poles, see Poles—Sliding—Fire Escape 21

SLOTS
Masonry—Metal 3

SMOKE
Chambers—Fireplace 26
Stacks—Steel 3

SMOKESCREENS
See Partitions; Doors—Metal Covered 14

SNOW
Guards, see Guards—Snow 6

SOAP
Dispensers — Individual — Liquid, Powdered and/or Lather 27
Flakes 27

SOAP—Cont.
Floor Cleaning 17
Liquid 27
Powdered 27
Systems—Liquid, Powdered and/or Lather 27

SOAPSTONE 4

SOCKETS
Ceiling, see Inserts—Concrete 3
Electric 23
Roof Awning, see Awnings—Roof ... 16

SODIUM HYPOCHLORITE CONTROL APPARATUS, see Hypochlorite—Control Apparatus 21

SOFFIT
Clips, see Caging—Wire—Beam and Girder 3

SOFTENERS
Water—Domestic and Industrial 27

SOLARIUMS, see Greenhouses and Conservatories; Enclosures—Glass ... 21

SOOT
Blowers and Cleaners 26

SOUND DEADENING MATERIALS 10
Doors, see Doors—Sound Retarding .. 14
Fiber, see Wallboard—Fiber; Insulation 10
Floor and Wall, see Insulation—House 10
Gypsum, see Floor Construction—Gypsum; Concrete—Filler Tile; Tile Form—Hollow—Gypsum 3
Machinery Insulation or Vibrations, see Isolation—Machinery Vibration 10
Mineral Wool, see Insulation—House 10
Nailing Concrete, see Nailing Concrete 3
Partitions—Folding, see Partitions—Folding—Fabric Covered and/or Sound Retarding 20
Quilted Felt, see Insulation—House—Blanket or Bat Form 10
Rock Wool, see Insulation—House—Wool 10
Sheet Steel, see Sheet Metal Steel—Fabric Surfaced 10
Wallboard, see Wallboard—Fiber ... 10
Wood Fiber, see Wallboard—Fiber; Insulation—House—Board Form .. 10

SOUND DEADENING SYSTEMS 10

SOUNDPROOFING
Doors and Windows—Strips for 10

SOUND REPRODUCTION SYSTEMS, see Public Address—Systems; Radio .. 25

SPACERS
Bar—Concrete Reinforcement, see Clips—Bar—Concrete Reinforcing. 3
Form, see Form—Ties, Clamps and Spacers 3

SPANDRELS
Aluminum, see Ornamental—Metal Work; Castings—Aluminum 13
Brass or Bronze, see Ornamental—Metal Work 13
Cast Iron, see Ornamental—Metal Work; Castings—Brass or Bronze. 13
Cast Stainless Steel, Vitreous and/or Porcelain Enameled, see Sheet Metal—Vitreous and/or Porcelain Enameled 13
Felt, Cloth or Fabric, see Flashings—Fabric 6
Greenstone, see Greenstone 4
Lead, see Leadwork—Decorative 13
Lead Covered Sheet Metal, see Sheet Metal—Lead Coated 6
Porcelain Enamel or Metal Faced, see Sheet Metal—Vitreous and/or Porcelain Enameled 13
Slate, see Slate—Structural 11

SPANDRELS—Cont.
Steel, see Sheet Metal 13
Stone, see Stone—Soapstone 4
Terra Cotta, see Terra Cotta—Architectural 4
Waterproofing—Metal for 6
Waterproofing—Felt, Cloth or Fabric for, see Waterproofing—Felt, Cloth or Fabric 5

SPANNERS
Fire Hose, see Fittings—Fire Hose and Tubing 21

SPEAKING
Tubes—Jail 21

SPIRAL
Fire Escapes, see Fire—Escapes—Spiral 12
Gravity Chutes, see Chutes—Gravity—Straight or Spiral 21
Stairs, see Stairs—Iron or Steel—Spiral 12

SPOTLIGHTS
Electric 24

SPRAY
Hose—Faucet 28

SPRING
Expansion Joint 11

SPRINGBOARDS 21

SPRINKLER
Hangers, see Hangers—Pipe 26
System Supervisory Service 21
Systems—Automatic—Fire 21
Systems—Lawns 21
Systems—Air Conditioning Installation 26
Tank Alarms, see Signal Systems—Electric—Tank Alarm 25
Tanks—Elevated Steel 27
Tanks—Elevated Wood 27

STABLE
Fittings and Fixtures 21

STACKS
Asbestos-Cement 26
Book, Newspaper, etc., see Book Stacks 21
Breeching, see Steel—Plate Construction 3
Metal 21
Smoke—Steel, see Smoke—Stacks—Steel; Steel—Plate Construction .. 3

STADIUM
Seat Brackets, see Castings—Stadium Seat 13
Seating, see Bleachers — Seating; Seating—Portable 21

STAGE
Effects, Property, etc. 24
Elevators, see Elevators—Theater ... 22
Fittings and Lightings—Electrical ... 24
Rigging 21
Theater Curtains, see Curtains—Theater 21
Ventilators, see Ventilators—Theater 7

STAINLESS
Steel, see Metals—Corrosion and Rust Resistant 13

STAINS
Brick and Stucco—Waterproof 17
Mortar, Cement, Concrete and Stucco, see Colors—Mortar, Cement, Concrete and Stucco 5
Shingle 17
Wood—Acid, Oil, etc. 17

STAIR
Enclosures, see Partitions; Doors—Metal Covered

STAIRS
Aggregates for, see Terrazzo—Aggregates 11
Art Marble, see Art—Marble 11

STAIRS—Cont.
Disappearing — Ceiling Suspended — Steel 12
Disappearing—Ceiling Suspended—Wood 12
Emergency, see Fire—Escapes 12
Folding — Ceiling Suspended, see Stairs—Disappearing 12
Iron or Steel 12
Iron or Steel—Channel Stringers for . 12
Iron or Steel—Spiral 12
Iron or Steel—Standard 12
Iron or Steel—Treads for, see Treads 12
Movable—Disappearing, see Stairs—Disappearing 12
Moving, see Escalators 22
Treads and Nosings, see Treads and Nosings 12
Treads and Risers, see Treads and Risers 11
Wood, see Millwork 8

STALLS
Cow or Horse—Steel 21
Shower Bath, see Cabinets—Shower . 27
Shower Bath—Casings for 27
Steel 21
Toilet, Shower or Urinal, see Partitions — Toilet, Shower Dressing Room or Urinal 20

STAMPED METAL
Work, see Sheet Metal 13

STANCHIONS
Metal 13
Steel and Wood Lined 21

STANDARDS AND BRACKETS
Lamp 24

STANDPIPE
Hose Connections 21

STANDPIPES 3
Steel, see Steel—Plate Construction . 3

STANDS
Grand, see Grandstands; Gymnasium—Folding Grandstands 21
Vegetable—Display 28

STAPLES 16

STARTERS
Motor, see Controllers — Motor — Automatic and Manual; Switches—Electric—Motor Starting 23

STATIONERY
Cabinets, see Cabinets—Metal—Storage 21

STATUARY
Metal 13
Terra Cotta, see Furniture—Garden .. 21
—Terra Cotta—Architectural 4

STAYS
Casement Window, see Hardware—Casement Window Adjusters and/or Stays 16
Door, see Holders—Door 16

STEAM TABLES
Stationary or Portable—Standard or Special 28

STEAMERS
Vegetable—Iron, Aluminum, Stainless—Gas and Steam Heated 28

STEEL
Collapsible Folding Gates, see Gates—Folding—Lazy Tong and Bostwick . 20
Concrete Reinforcement, see Concrete—Reinforcement 3
Decks, see Decks 3
Designers, Fabricators and Erectors, see Structural—Steel Fabricators, Designers and Welders 3
Heat Resisting, see Metals—Heat Resistant 13
Joists, see Joists—Steel; Structural—Shapes 3

STEEL—Cont.
Plate Construction 3
Stainless, see Metals—Corrosion and Rust Resistant 13
Structural, see Structural—Shapes—Angles, Channels, I-Beams, etc. .. 3
Studs—for Non-bearing Partitions, see Furring—Cold Formed Channels 9

STEEL WOOL
Machines for Floors 17

STEPPING
Stones, see Flagging 11

STEPS
Manhole 11
Safety—Ladder, etc. 12
Stair, see Treads 12

STERILIZERS
Water, see Chlorine—Control Apparatus; Hypochlorite—Control Apparatus 21
—Filters—Gravity or Pressure; Stills—Water Purification 27

STILLS
Water Purification 27

STIRRUPS
Metal, see Clips—Bar Concrete—Reinforcing Devices; Caging—Wire—Beam and Girder 3

STOKERS
Coal 26

STONE
Ashlar 4
Ashlar—Shot Sawed, see Specific Kind of Stone 4
Backing, see Waterproofing; Dampproofing 5
Bluestone, see Bluestone—Natural .. 4
Brown Sandstone 4
Cast—Interior and/or Exterior 4
Concrete—Glass Covered 4
Cut, see Specific Type of Stone; Stone—Cast 4
Flagging, see Flagging—Natural Stone 11
Flooring, see Specific Type of Flooring—Stone 11
Greenstone, see Greenstone 4
Limestone, see Limestone 4
Natural, see Bluestone; Greenstone; Granite; Marble; Sandstone; Slate; etc. 4
Sandstone, see Sandstone 4
Soapstone 4

STONE PRESERVATION, see Restoration and Preservation—Building Exteriors 1

STONEWARE
Chemical 27

STOOLS
Window—Art Marble, see Art—Marble 11
Window—Metal, see Casings—Window—Metal 9
Window—Tile, see Tile 11

STOOLS AND CHAIRS
Automatic Adjustable 21

STOPS
Door 16

STORE AND MARKET
Fixtures 21

STORE FRONT
Awnings—Built-in 16
Construction—Metal 19
Construction—Metal—Disappearing . 19

STORE FRONTS
Metal, see Ornamental—Metal Work 13
—See Front Work 19
Phenolic Fiber, see Panels—Phenolic Fiber 11
Porcelain Enameled, see Sheet Metal—Porcelain Enameled 13
Stone, see Specific Type of Stone ... 4
Terra Cotta, see Terra Cotta 4
Tile, see Tile—Clay—Ceramic—Decorative and Faience 11

STORM
Sash, see Sash—Storm; Windows—Double Glazing; Windows—Basement 15

STOVE
Trimmings 28

STOVES
Cooking, see Ranges 28
Franklin, see Franklin—Stoves 26
Laundry 28

STRAINERS
Oil 26
Pipe 26
Roof 27
Sink 28
Sink—Acid Resistant 27
Swimming Pool, etc., see Swimming Pool—Drains, Strainers and Fittings 21
Urinal, see Drains—Floor, Yard, etc.. 27

STRAPS
Leader Pipe, see Conductors—Pipe Fasteners and Fittings for 6

STRIKES
Door and Gate 16

STRINGERS
Steel Stair, see Stairs—Iron or Steel—Channel Stringers for 12

STRIP
Lath, see
—Lath—Interior Corner Reinforcement 9
—Lath—Expanded and/or Perforated Metal Sheet 9

STRIP LIGHTS, see Stage—Fittings and Lighting—Electrical; Lighting Fixtures—Electric 24

STRIPS
Batten—Wallboard, see Wallboard—Joint Finisher 11
Blackboard, see Blackboard—Tack Strips 21
Edging—Floor Covering, see Edgings—Floor Covering 11
Lighting, see Stage—Fittings and Lighting—Electrical; Lighting Fixtures—Electric 24
Metal—Base Beads for Terrazzo Floor 11
Metal—Carpet, Mats, etc. 11
Metal—Terazzo, Floor, Composition, Marble, Linoleum, Rubber and Asphalt Tile, etc. 11
Plastic—Colored—Floor Dividing 11
Rubber 11
Stainless Steel, see Metals—Corrosion and Rust Resistant 13
Tile—Decorated Wall, see Tile—Clay Floor and Wall 11
Window, see Weatherstrips—Metal for Double Hung Windows, Casements, Doors, Transoms, etc. 16

STRUCTURAL
Board, see
—Lath; Wallboard—Gypsum 9
—Plywood 8
—Wallboard—Fiber 10
Glass, see Glass—Structural 11
Shapes—Angles, Channels, I-Beams, Bars, Trusses, etc., see Shapes—Structural 3
Slate, see Slate—Structural 11

STRUCTURAL—Cont.
Steel Fabricators, Designers and Welders 3
Steel—Inspection of, see Inspection and Testing—Structural Materials. 1
Steel Trusses, see Trusses—Steel and Timber 3
Timber Truss Fabricators and Designers, see Trusses—Arch Construction 3

STUCCO
Base, see
—Lath—Metal; Lath—Metal and Paper or Insulation—Combination 9
—Tile—Hollow—Clay or Terra Cotta, Exterior and Load Bearing; Tile—Hollow or Solid—Cinder Concrete 4
Colors, see Colors—Mortar—Cement and Stucco; Stains—Mortar 5
Hydrated Lime, see Lime—Hydrated. 9
Hydraulic Lime, see Lime—Hydraulic Masons; Cement—Portland 4
Nailing Concrete, see Nailing Concrete 3
Portland Cement—Colored—Premixed 9

STUDDING
Metal, see Furring and Studding—Metal 9

SUBBASE
Armored Concrete 13

SUBSILLS
Stormproof—Casement or Vertically Pivoted Windows, see Hardware—Casement Window 16

SUMMER
Houses 21

SUMPS
Covers for 27
Pumps, see Pumps—Bilge; Ejectors—Sewage 27
Roof, see Drains—Roof 27

SUNDIALS 21

SUPPORTS
Pipe, see Hangers—Pipe 26
Radiator, see Radiator—Hangers 26
Shelf, see Adjustable—Shelving 16

SURFACE
Armor Flooring, see Grids—Flooring—for Armoring Concrete and Asphalt Floors 11
Metal Raceway, see Conduit—Electrical—Metal Moulding or Raceway. 23

SUSPENDED
Ceiling Systems, see Ceiling—Suspended Systems 9

SWEEPERS
Vacuum, see Vacuum Cleaners 28

SWIMMING POOL
Brick, see Brick 4
Cleaning Tools 21
Design and Construction 21
Drains, Strainers and Fittings 21
Equipment—Springboards, Ladders, Safety Equipment, etc. 21
Expansion Joints, see Joints—Expansion—Concrete 3
Glass, see Glass, Structural 11
Glass Covers for 21
Heaters, see Specific Type of Heaters—Water 27
Observation Windows 21
Paint, see Waterproofing—Paint and Compounds 5
Recirculation Systems 21
Scum Gutters 21
Submarine Lighting 21
Tile, see Tile—Clay 11
—Tile—Hollow—Clay or Terra Cotta 4
Tile Lining Construction, see Swimming Pool—Design and Construction 21

SWIMMING POOL—Cont.
Wall Slabs ... 21
Water Purification Apparatus, see Chlorine — Control Apparatus; Hypochlorite—Control Apparatus. 21

SWITCHBOARD
Enclosures, see Partitions — Open Mesh ... 20
Enclosures—Outdoor, see Fences and Fencing—Chain Link ... 21
Fittings and Accessories ... 23

SWITCHBOARDS
Lighting and Power—Open Knife and /or Dead Front ... 23
Telephone ... 25
Theater ... 23

SWITCHES—ELECTRIC
Boiler—Low Water Protection, see Boiler—Low Water Protector ... 26
Convenience Outlet Combined, see Receptacles — Electric — Convenience Outlet and Switch Combined ... 23
Disconnecting ... 23
Door—Closet ... 23
Entrance or Meter Servi e ... 23
Float ... 27
High or Low Water Tank Alarm, see Signal Systems—Tank Alarm ... 25
Knife ... 23
Lock ... 23
Magnetic ... 23
Motor Starting ... 23
Program—Motor Driven ... 23
Push Button, Toggle, Tumbler, Pull, Snap, Pendant ... 23
Push Button, Toggle, etc.—Warning Light Combination ... 23
Remote Control ... 23
Safety—Externally Operated ... 23
Tumbler, Snap—Circuit Breaker Type 23

SWITCHES—PNEUMATIC
Damper or Valve Control, see Controllers—Temperature ... 26

SWITCHGEARS
Electric ... 23

T

TABLE
Legs or Supports ... 13
Tennis—Tables and Accessories for ... 21
Tops
—Linoleum, see Tops — Table, Counter, Bar—Linoleum ... 11
—Phenolic Fiber, see Tops—Table, Counter, Bar—Phenolic Fiber ... 11
—Porcelain Enamel, see Tops—Table, Counter, Bar—Porcelain Enamel ... 28
—Rubber, see Tops—Table, Counter, Bar—Rubber ... 11
—Stone or Wood, see Tops—Table, Counter, Bar—Stone or Wood ... 21

TABLES
All Purpose—Folding Legs ... 21
Cafeteria and Restaurant—With Attached Chairs ... 28
Drawing ... 21
Garden, see Furniture—Garden ... 21
Ironing, see Ironing—Boards ... 28
Kitchen — Planning, see Cabinets — Kitchen ... 28
Laboratory, see Furnishings and Equipment—Laboratory ... 21
Library, see Furnishings and Equipment—Bank, Office and Library ... 21
Metal ... 28
Mortuary—Autopsy ... 28
Serving—Diet Kitchen, Hospital, Hotel Kitchen Work, Cooks'—Metal Wood Top, see Steam Tables ... 28
Sewing and Cutting ... 21
Wood ... 21

TABLETS
Bronze, Brass, Aluminum, etc. ... 13
Inlaid Vitreous and/or Porcelain Enameled ... 13

TACK
Boards, see Blackboard Mouldings ... 21
Room Fittings ... 13
Strips—Blackboard, see Blackboard—Tack Strips ... 21

TAIL
Rails, see Barn—Equipment ... 21

TANK
Alarms—High or Low Water, see Signal Systems — Electric — Tank Alarms ... 25
Heads—Wrought Iron ... 27
Linings, see Lagging—Tank ... 10
Structures, see Structural—Steel Fabricators and Designers ... 3

TANKED
Gas, see Gas—Tanked or Bottled ... 28

TANKS
Cement—Acidproof ... 4
Chemical, see Tanks—Steel ... 27
Elevated—Steel ... 27
Elevated—Wood ... 27
Galvanized ... 27
Gasoline ... 27
Hot Water ... 27
Hot Water Storage ... 27
Pickling, Plating, etc. ... 27
Pneumatic, see Tanks—Steel ... 27
Pressure or Closed Expansion ... 27
Range Boilers, see Boilers—Range ... 27
Septic, see Septic—Tanks ... 27
Slate, see Slate—Structural ... 11
Soap, see Soap Dispensers—Individual —Liquid, Powdered and/or Lather 27
Steel ... 27
Steel—Lined ... 27
Storage, see Tanks—Steel; Tanks—Boilers — Range; Tanks — Hot Water ... 27
Surge ... 3
Wood ... 27
Wood—Lined ... 27

TANKS AND VESSELS
Pressure ... 27

TAPE
Friction ... 23
Plumbers ... 26
Rubber ... 23

TAR
Pitch, see Pitch—Roofing, Waterproofing, Paving, etc. ... 6

TARPAULINS ... 6

TEAR GAS
Protective Systems, see Protective—Devices—Bank, Office, etc.—Gas 21

TELEPHONE
Cabinets, see Cabinets—Telephone ... 21
Instruments—Desk, Wall, etc. ... 25
Inter or Intra—Communicating Systems ... 25
Plugs, see Receptacles—Electric ... 23
Power Supply Cabinets ... 25
Raceway and/or Outlets Overflow, see Conduit—Telephone Raceway and/or Outlets Overflow ... 23
Service—Public ... 25
Signal System Combination, see Signal System—Electric—Telephone and/or Signal System Combination 25
Switchboards, see Switchboards—Telephone ... 25

TELLERS'
Lockers ... 21

TEMPERATURE
Regulators or Controls, see Controllers—Temperature ... 26
Regulators—Damper, see Regulators —Damper ... 26
Regulators—Tank or Valve Controlling, see Controllers—Temperature 26

TENNIS
Court Enclosures, see Fences and Fencing—Chain Link ... 21
Court Fittings and Equipment ... 21
Court Lighting, see Floodlights—Electric ... 24
Court—Surface Dressing ... 21
Courts ... 21
Nets ... 21
Table Accessories ... 21
Tables for ... 21

TERMITE
Preventive Treatment for Erected Structures ... 17
Preventive Treatment—Lumber ... 8

TERRA COTTA
Architectural ... 4
Ashlar ... 4
Blocks, see Tile—Hollow—Clay or Terra Cotta ... 4
Chimney Caps, see Chimney—Caps and Pots—Clay or Terra Cotta ... 4
Roofing—Tile, see Tile—Roofing—Clay or Terra Cotta ... 6

TERRAZZINE
Treatment, see Terrazzo—Floor Finish ... 17
Treatment, see Stucco—Portland Cement—Colored—Pre-mixed; Plaster—Texturing—Colored ... 9

TERRAZZO
Aggregates ... 11
Aggregates—Non-slip ... 11
Base Divider—Cove, see Dividers—Floor and Cove Base ... 9
Cement for ... 11
Cleaning Compounds, see Cleaners, Polishers and Preservatives—Tile, Marble, Linoleum, Brick, etc. ... 17
Cove Base, see Terrazzo—Precast ... 11
Curing, see Flooring—Cement and Terrazzo—Curing and Protection. 17
Expansion Joints for, see Joints—Expansion—Terrazzo or Cement Floor 11
Finish for, see Terrazzo—Floor Finish 17
Floor Dividing Bars, see Strips—Metal ... 11
Floor Dividing Bars—Hospital—Static Elimination, see Grids—Flooring—Electrical Grounding ... 11
Floor Dividing Strips—Plastic—Colored, see Strips—Plastic—Colored —Floor Dividing ... 11
Floor—Finish ... 17
Flooring—Contractors for ... 11
Flooring—Magnesite, see Flooring—Magnesite Composition ... 11
Precast — Wainscoting, Cove Base, Slabs, Trim, etc. ... 11
Treads, see Terrazzo—Precast; Flooring—Terrazzo—Contractors for ... 11

TESTING
Borings, see Borings—Test—Foundation ... 1
Equipment; Efficiency, see Inspection and Testing—Structural Materials; Equipment; Efficiency; etc. ... 1
Structural Materials, see Inspection Testing—Structural Materials; Equipment; Efficiency; etc. ... 1

TEXTURING
Paint, see Painting—Texturing ... 17

THEATER
Aisle Lights, see Reflectors—Lighting —Aisle Lighting—Theater ... 24
Curtain Operators, see Curtains—Theater Stage ... 21
Curtains, see Curtains—Theater Stage 21
Elevators, see Elevators—Theater—Orchestra, Organ Console, Stage, etc. ... 22
Equipment, see Furnishings and Equipment—Theater ... 21

THEATER—Cont.
Equipment—Electric, see Stage—Fittings and Lighting—Electrical . . . 24
Stage Ventilators, see Ventilators—Theater Stage, etc. 7
Switchboards, see Switchboards—Theater 23
Ticket Booth and Equipment, see Ticket—Booth and Equipment—Theater 21

THERMOMETERS
Indicating and Recording 26

THERMOSTATICALLY OPERATED
Radiator Valves, see Valves Radiator Supply — Thermostatically Operated 26

THERMOSTATS 26
Weather Compensating 26

THIMBLES
Wire Rope, see Rope—Wire Fittings for 22

THRESHOLDS AND SADDLES
Bluestone 4
Metal 19
Rubber, see Flooring—Rubber 11
Safety—Non-slip 12
Slate 4
Soapstone 4
Tile, see Tile 11
Weatherstrip Combination 16

THROATS
Fireplace, see Dampers—Fireplace . . . 26

TICKET
Cancelling Machines 21

TIE
Rings 13

TIES
Rods, Band, Wire, etc. 9

TIERING
Machines, see Elevators—Portable . . 21

TIES
Bar—Concrete Reinforcing, see Clips Bars Concrete Reinforcing 3
Wall—Metal, see Anchors—Veneer Wall 3
Wood, see Lumber 8

TILE
Backup, see Tile Form—Hollow or Solid — Cinder Concrete — Load Bearing, Partition Furring, Floor, Arch, etc. 4
Ceramic Mosaic, see Tile—Clay—Floor and Wall 11
Ceramic—Non-slip, see Tile—Paving —Non-slip 11
Ceramic—Decorative and Faience, see Tile Clay—Floor and Wall 11
Clay—Floor and Wall 11
Cleaners and Polishers, see Cleaners, Polishers and Preservatives—Tile, Marble, Linoleum, Brick, etc. 17
Drain Sewer, see Tile—Sewer Drain Disposal Plants 27
Facing, see
—Tile—Clay—Floor and Wall—Glazed, Unglazed, Matt or Brite —Non-vitreous, Semi-vitreous, Vitreous, Impervious—Dust Pressed and/or Plastic 11
—Tile—Hollow Clay or Terra Cotta—Glazed 4
Floor—Clay, see Tile—Clay—Floor and Wall—Glazed, Unglazed, Matt or Brite—Non-vitreous, Semi-vitreous, Vitreous, Impervious—Dust Pressed and/or Plastic 11

TILE—Cont.
Glazed, see
—Tile—Hollow Clay or Terra Cotta—Glazed; Brick—Salt Glazed 4
—Tile—Paving; Tile—Clay—Ceramic; Tile Form—Steel Enameled 11
Hollow—Clay or Terra Cotta—Backing Up, see Tile—Hollow—Clay or Terra Cotta—Load Bearing 4
Hollow—Clay or Terra Cotta—Book, see Tile—Hollow—Clay or Terra Cotta—Partition, Furring, etc. . . . 4
Hollow—Clay or Terra Cotta—Glazed or Unglazed 4
Hollow—Clay or Terra Cotta—Load Bearing 4
Hollow—Clay or Terra Cotta—Partition, Furring, Beam and Column Covering, etc. 4
Hollow—Clay or Terra Cotta—Segmental and Flat Arch 4
Mosaic Ceramic, see Tile Clay Floor and Wall 11
Packing House, see Brick—Floor 4
Paving—Non-slip 11
Paving—Quarry, see Tile—Quarry or Promenade—Paving or Wall 11
Quarry or Promenade—Paving or Wall 11
Roofing—Clay or Terra Cotta 6
Roofing—Quarry or Promenade, see Tile—Quarry or Promenade—Paving or Wall 11
Sewage Disposal or Drainage—Connectors for 27
Sewer Drain Disposal Plants 27
Stairs—Non-slip, see Tile—Paving—Non-slip; Treads—Safety 11
Structural, see Tile—Hollow Clay or Terra Cotta—Load Bearing 4
Terra Cotta—Glazed, see Tile—Clay or Terra Cotta—Glazed or Unglazed 4
Wall—Loading Bearing, see Tile—Hollow—Clay or Terra Cotta—Load Bearing 4

TILE FORM
Acoustical, see Acoustical—Materials and Treatments 10
Art Marble, see Flooring—Art Marble; Art Marble; Stone—Cast; Terrazzo . 11
Asbestos—Cement 6
Asphalt, see Flooring—Asphalt—Tile Form 11
Asphalt—Dividing Strips for, see Strips—Metal— Terrazzo Floor, etc. 11
Board Form, see Wallboard—Tiled . . 11
Cork, see Insulation—Cold Storage or Refrigeration 10
Cork or Cork Composition, see Flooring—Cork Tile Form 11
Fiber and Cane 11
Fiber and Cane—Decorative 11
Fiberized Mastic, see Flooring—Fiberized Mastic 11
Floor—Gypsum, see Floor Construction—Gypsum 3
Glass for Vault and Sidewalk, see Vaults—Sidewalk Lights for 7
Hollow Glass 4
Hollow—Gypsum—Partition, Furring, Beam and Column Covering, etc. 4
Hollow or Solid—Cinder Concrete—Load Bearing, Partition, Furring, Floor Arch, etc. 4
Interlocking Rubber, see Flooring—Rubber 11
Linoleum, see Flooring—Cork Composition 11
Magnesite Composition, see Flooring —Magnesite Composition 11
Marble 11
Mastic Composition, see Flooring — Asphalt—Tile Form 11

TILE FORM—Cont.
Metal, see
—Tile Form—Steel—Enameled . . 11
—Tile Form—Roofing—Metal . . . 6
Paving Linoleum, see Flooring—Cork Composition 11
Paving—Rubber, see Flooring—Rubber—Tile Form 11
Roofing—Asphalt, see Flooring—Asphalt—Tile Form 11
Roofing—Concrete 4
Roofing—Concrete Slab—Light Weight, see Concrete — Light Weight 3
Roofing—Glass Insert 3
Roofing—Gypsum, see Roof Construction — Gypsum; Slabs — Precast Gypsum 3
Roofing—Metal 6
Roofing—Reinforced Cement 6
Rubber — Binding Strips for, see Strips— Metal — Terrazzo Floor, etc. 11
Rubber—Cork, see Flooring—Cork Composition 11
Rubber—Floor, see Flooring—Rubber —Tile Form 11
Sheet or Board, see Wallboard—Tiled 11
Slate, see Slate 11
Steel—Enameled 11
Steel—Floor, see Forms—Metal 3
Steel—Wall 11
Wall—Asphalt, see Flooring — Asphalt Tile Form 11
Wall—Metal, see Tile Form—Steel; Tile Form Steel Enameled 11
Wall—Sheet or Board, see Wallboard —Tiled 11
Wall—Steel Enameled, see Tile——Form—Steel—Enameled 11
Wall—Wood Fiber, see Wallboard Tiled 11
Wood Fiber, see Tile Form — Fiber and Cane 11
Wood Flooring, see Flooring—Wood Block 11
X-Ray Protective 10

TIMBER
Connectors, see Connectors—Timber . 8
Natural, see Lumber 8

TIME
Recorders, see Recorders—Time—Watchman's 25

TIN AND TERNE PLATE
See Sheet Metal—Tin and Terne Plate 13

TIPPLES
Coal 3

TOILET
Niche 21
Paper 27
Paper Holders, see Bathroom Accessories 27
Partitions Fittings, see Fittings—Toilet Partition — Marble, Slate, etc. 20
Partitions, see Partitions — Toilet, Shower Dressing Room or Urinal . . 20
Seats, see Closet—Seats 27
Supports for 27
Systems—Chemical, see Chemical—Toilets 27
Systems—Septic Tank, see Septic —Tanks 27

TONE
Cabinets 21

TOOL ROOM
Enclosures, Partition—Open Mesh . . . 20

TOOLS
Cleaning—Swimming Pool, see Swimming Pool—Cleaning Tools 21
Conduit, see Conduit—Electrical . . . 23
Hand 1
Hay and Grain 21
Lath Clip 9
Pneumatic 1

TOPS
Cabinet, see Cabinet—Tops 28
Plywood, see Plywood 8
Sink—Linoleum Composition, Porcelain, Stainless Steel, Monel Metal, Wood, etc. 28
Table, Counter, Bar, etc.—Fiber Board 28
Table, Counter, Bar, etc.—Linoleum 11
Table, Counter, Bar, etc.—Monel Metal 28
Table, Counter, Bar, etc.—Phenolic Fiber 11
Table, Counter, Bar, etc.—Porcelain Enameled 28
Table, Counter, Bars, etc.—Rubber 11
Table, Counter, Bar, etc.—Stainless Steel 28
Table, Counter, Bar, etc.—Stone or Wood 21

TOWEL
Bar or Racks, see Bathroom Accessories 27
Dryers, see Dryers—Towel 28

TOWELS
Continuous Cloth 27
Paper 27
Paper—Holders for, see Bathroom Accessories 27

TOWER
Chimes, see Chimes—Tower 21

TOWERS
Cooling Atmospheric, Forced Draft, Spray Nozzle, etc. 26
Diving, see Swimming Pool — Equipment 21
Movietone Horn 21
Transmission, Wireless, etc.—Steel 3

TRACERY
Cast Iron, see Castings—Iron—Architectural 13
Window—Cast Stone, see Stone—Cast 4

TRACK
Cabinet Door Sliding 16
Door, see Hangers—Door, Partition or Gate; Hardware—Folding Door or Partition 16

TRACTION
Elevator, see Elevators—Traction ... 22

TRANSFORMERS
Current 23
Distribution 23
Miniature—Bell Ringing, Annunciators, etc. 23
Power and Lighting 23

TRANSOM
Adjusters, see Hardware — Casement Window Adjusters and/or Stays .. 16
Catches and Chain, see Chain—Sash . 16
Operators and Lifters, see Hardware—Transom Operators and/or Lifters . 16
Ventilators, see Louvers—Door Ventilating 16

TRANSOMS
Weatherstrip, see Weatherstrips — Metal—for Double Hung Windows, Casements, Doors, Transoms, etc. 16

TRANSPARENT ROOF CONSTRUCTION
See Skylights 7

TRAP AND DRAIN
Combination, see Drains—Trap 27

TRAPS
Automatic Seal for 27
Backwater Valve, see Valves—Backwater; Drains—Backwater Valve 27
Bell, see Drains—Floor, Yard, etc.; Trap and Drain—Combination ... 27
Blast, Coil or Bucket, see Traps—Steam and Return Steam 26

TRAPS—Cont.
Blast—Float and Thermostatic, see Traps—Radiator; Traps—Steam . 26
Boiler Return, see Traps—Return Steam 26
Floor, Stage or Theater 21
Garage or Oil 27
Grease or Oil 27
Laundry 27
Plaster, Sink, Hair and Sediment, Dental, Surgical, etc. 27
Radiator—Thermostatic and Vacuum—Automatic 26
Return Steam, see Traps—Steam or Return Steam 26
Sink, etc.—Acid Resistant 27
Steam or Return 26

TRAVERTINE
Reproduction, see
—Paint Texturing 17
—Precast—Art Marble 11
—Scagliola 9
—Stone—Cast 4

TRAYS
Wire 28

TRAYS AND TUBS
Laundry, see Laundry — Tubs and Trays 27
Phenolic Fiber 11

TREADS
Art Marble, see Treads and Risers—Art Marble 11
Asphalt, see Flooring—Asphalt Mastic; Flooring—Asphalt Tile Form .. 11
Bluestone 11
Carborundum—Tile Form, see Treads Safety 11
Cork or Cork Composition, see Flooring—Cork; Flooring—Cork Composition 11
Grating 11
Greenstone 4
Linoleum, see Linoleum 11
Magnesite Composition, see Flooring—Magnesite Composition 11
Marble, see Marble 4
Non-slip, see Tile—Paving—Non-slip 11
Precast—Wainscoting, Cove Base, Slabs, Trim, etc. 12
Rubber, see Flooring—Rubber 11
Safety 12
Slate 11
Soapstone 4
Stone 11
Terrazzo, see Terrazzo—Flooring—Contractors for 11
Tile, see Tile 11
Wood, see Millwork 8

TREADS AND NOSINGS
Cork, see Flooring—Cork Tile Form .. 11
Rubber, see Flooring—Rubber 11
Safety 12

TREADS AND RISERS
Bluestone 11
Cork, see Flooring—Cork Tile Form .. 11
Rubber, see Flooring—Rubber 11
Steel or Pressed Steel 12
Stone 11

TREATED
Lumber, see Lumber—Creosoted or Salt Treated 8

TRELLISES
Iron and Wire 20
Wood 21

TRENCH
Covers, see Covers and Frames 13

TRIM
Asbestos—Cement 11
Blackboard, see Blackboard—Mouldings 21
China 27
Concrete or Artificial Stone 4

TRIM—Cont.
Door—Frames, see Frames—Door—Buck and Trim Units 14
Fiber 11
Frame and Buck Units, see Frames—Door—Buck and Trim Units 14
Hardware, see Hardware—Finish Door 16
Hollow Metal 14
Magnesite Composition, see Flooring—Magnesite Composition 11
Metal Covered 14
Metal—Flush 9
Metal Lath, see Specific Products .. 9
Metal—for Panels of Metal, Linoleum, Bakelite, Glass, Plywood, Fiber Board, etc. 11
Plywood, see Plywood 8
Soapstone 4
Terrazzo, see Terrazzo—Precast 11
Tile, see
—Tile—Hollow—Clay or Terra Cotta 4
—Tile—Paving; Tile Form—Steel Enameled 11
Wood 8

TROUGHS
Blackboard—Chalk, see Blackboard Trough 21
Conveyor 21
Eaves, see Gutters—Roof 6
Water 21
Window—Metal 16

TROUSER
Hangers, see Garment Carrier Equipment 16

TRUCKS
Ash Can, Milk Can, Drums, etc. 26
Book Library 21
Feed, see Barn—Equipment 21
Garment 28
Mop 17
Mortuary 28

TRUSSED
Steel Joist, see Joists 3

TRUSSES
Arch Construction 3
Steel, see Structural Shapes; Joists 3
Steel and Timber 3
Wood 3

TUBE
Fittings, see Fittings—Pipe 27

TUBES AND TUBING
Aluminum 27
Boiler 26
Copper, see Pipe—Brass or Copper; Tubes and Tubing—Copper, Silicon Alloys 27
Copper Silicon Alloys 27
Electrical, see Conduit—Electrical ... 23
Fittings, see Fittings—Pipe 27
Seamless Brass, Bronze, Copper, Iron or Steel 27
Steel—Stainless 27
Steel—Welded, see Pipe—Steel—Welded 27

TUBS AND TRAYS
Laundry, see Laundry — Tubs and Trays 27

TUMBLER
Clothes, see Dryers—Cothes—Tumbler 28

TUNING
Devices 21

TURBINES
Steam 26

TURNSTILES
Subway, Theater, etc. 21

TURNTABLES
Automobile—Pit or Pitless 13
Locomotive 3

TYPEWRITER
Stands 21

U

UMBRELLA RACKS
Check Room, see Check Room Equipment 21

UMBRELLAS
Beach 21

UNDERCOATS
Enamel, see Enamel—Undercoats ... 17

UNDERPINNING
Building 2

UNIONS
Pipe, see Fittings—Pipe 27

UNIT
Air Conditioning, see Air Conditioning—Units 26
Coolers, see Coolers—Unit 26
Heaters, see Heaters—Unit 26
Heater and Ventilator Control Unit, see Controls—Air Conditioning .. 26
Ventilators—Heating and/or Cooling, see Ventilators—Unit 26

URINALS
Flush Valves for, see Valves—Flush—Closet or Urinal 27
Porcelain 27

URNS
Coffee, Tea or Milk 28
Cremation—Bronze, Copper, Aluminum, etc. 13
Garden, see Furniture—Garden 21

UTILITY
Shank for Roof Gutters 6

V

VACUUM
Breakers 27

VACUUM CLEANERS
Portable 28
Stationary 28
Truck Type 28

VALANCES
Show Window 21

VALVE
Covers, see Covers and Rings—Valves 13
Operating Mechanism for 26

VALVES
Air Vent—Steam and Return Main—Automatic 26
Ammonia, Freon-12, CO_2, etc., see Valves—Refrigerating 28
Automatic Expansion 26
Backwater 27
Check 27
Differential Pressure, see Heating Systems—Hot Water 26
Electrically Operated 26
Fire Line 21
Flap, see Valves—Backwater 27
Flow Control, see Heating Systems—Hot Water 26
Flush—Closet or Urinal—Meter Type 27
Foot Control—Lavatory or Shower .. 27
Gas Furnace Control 26
Gate 27
Globe, Angle, Cross 27
Hose, see Valves—Fire Line 21
Lift 26
Mixing or Tempering—Thermostatic 26
Mixing—Shower Bath 27
Radiator—Air Vent—Automatic ... 26
Radiator — Air Vent — Compression Type 26
Radiator—Air Vent—Convector Type 26
Radiator Supply — Combined with Thermostatic Trap 26
Radiator Supply—Electrically or Pneumatically Operated 26
VALVES—Cont.
Radiator Supply—Graduated or Modulated 26
Radiator Supply—Hot Water Forced Circulation Systems 26
Radiator Supply—Packless 26
Radiator Supply — Thermostatically Operated 26
Reducing or Regulating Pressure 26
Refrigerating 28
Relief and Reducing—for Hot Water Heating Systems 26
Relief—Air, Gas or Water 26
Relief—Pressure, Vacuum or Temperature—for Domestic Hot Water Systems 26
Sewer, see Valves—Backwater 27
Shear Gate 27
Shower Bath, see Valves—Mixing Shower Bath 27
Slide Gate 27
Soap Dispensing, see Soap—Dispensers 27
Sprinkler System, see Sprinkler—Systems—Automatic Fire 21
Steam and Water—Hot and Cold Water Mixing, see Valves—Mixing or Tempering—Thermostatic 27
Tempering, see Valves—Mixing or Tempering 27
Trap Seal 27
Vacuum Breaking for Domestic Hot Water Systems, see Valves—Relief Pressure, Vacuum and Temperature for Domestic Hot Water Systems 26
Vacuum Breaking for Vacuum Heating Systems 26
Vents—Air for Steam Heating Systems, see Valves—Air Vents—Steam and Return Main 26
Y, see Valves—Globe, Angle, Cross 27

VANES
See Weathervanes 13

VARNISH
Floor 17
Interior or Exterior 17
Lacquer, see Lacquer 17
Rubbing, see Varnish—Interior or Exterior 17
Spar 17
Stained 17

VASES
Garden—Terra Cotta, see Pottery—Garden 21
Metal 13

VATS
Wood 27

VAULT
Burglar Alarms, see Alarms—Burglar 25
Doors 21
Fixtures, see
—Filing Equipment—Metal 21
—Vaults—Safe Deposit and Bank—Burglar-Resistive 21
Lights, see Vaults—Sidewalk Lights for 7
Protection Alarms, see Alarms—Burglar 25
Ventilators, see Ventilators—Vault . 7

VAULTS
Arched, see Ceilings—Vaulted 3
Concrete Reinforcement for, see Concrete Reinforcement—Vault Construction 21
Fire-resistive Fronts 21
Safe Deposit and Bank—Burglar-resistive 21
Sidewalk Lights for 7

VEGETABLE
Bins, see Cabinet—Accessories..... 28
Display Stands, see Stands—Vegetable Display 28
Peelers, see Kitchen—Vegetable Peelers 28

VENEER
Plywood, see Plywood 8

VENEERED
Doors, see Doors—Veneered 14
Panels, see Panels—Veneered..... 11

VENEERS
Native and/or Imported Wood 8
Phenolic Fiber, see Panels—Phenolic Fiber 11
Wood—Cloth Backed 8
Wood—Fiber Backed 10

VENETIAN
Blinds, see Blinds—Venetian..... 16

VENT CONNECTIONS
Roof 6

VENTILATING
Brick, see Ventilators—Wall—Common Brick Size..... 7
Grilles, see Grilles and Screens; Dampers or Registers..... 26
Pipe—Acidproof 27
Skylights, see Ventilators — Skylight 7
Systems—Forced Draft and/or Gravity 26
Systems—Forced Draft—For Library Bookstacks 26
Window Shades, see Shades—Window, Skylight, etc.—Ventilating.. 16
Windows, see Windows—Balanced—Pivoted 15

VENTILATING AND HEATING
Units Combined, see Heaters—Air Conditioning Units; Ventilating—Systems 26

VENTILATOR
Bases 7
Cord, see Cord—Sash..... 16
Curbs—Steel 7

VENTILATORS
Attic—Gable 7
Auditorium, see Ventilators—Theater, Auditorium Stage, Elevator Shaft, etc.—Automatic 7
Automatic—Stage, see Ventilators——Theater, Auditorium Stage, Elevator Shaft, etc.—Automatic.... 7
Barn, see Ventilators—Roof..... 7
Ceiling 26
Controls for, see Regulators—Damper 26
Door—Lightproof 10
Door Panel, Transom, etc.—Louvered, see Louvers—Door Ventilating... 16
Gable, see Ventilators—Attic—Gable 7
Glass Top, see Ventilators—Roof.... 7
Grille, see Grilles and Screens; Dampers and Registers..... 26
Mushroom 26
Projection Room 16
Ridge 7
Roof—Power Driven (Electric or Belt) 7
Roof—Revolving (Wind Propelled). 7
Roof—Rotary, see Ventilators—Roof—Revolving 7
Roof—Stationary (Syphon and/or Gravity) 7
Sash, see Ventilators—Window Brackets for 16
Sidewalk 13
Skylight 7
Syphon and/or Gravity, see Ventilators—Roof—Stationary 7
Theater, Auditorium Stage, Elevator Shaft, etc.—Automatic..... 7
Unit—Heating and/or Cooling..... 26
Vault 7
Wall and Ceiling, see Grilles and Screens; Dampers or Registers.... 26
Wall—Common Brick Size..... 7
Wall—Fan Unit 26
Wall—For Brick, Concrete, Glass or or Frame Construction..... 7

VENTILATORS—Cont.
Wall—Fuel Oil Storage Tanks 26
Wall—Lightproof 7
Wall—Partitions, Closet, etc. 16
Window 16
Window—Brackets for 16
Window—Fan Unit, see Fans—Window Ventilating 26
Window—Lightproof 16
Window—Noise Excluding 16

VENTS
Air—Heating System, see Valves—Air Vent—Steam and Return Main—Automatic 26
Grille, see Grilles and Screens; Dampers and Registers 26
Roof 7
Roof—Acidproof 27

VERANDAS
Metal, see
—Fences and Fencing 21
—Ornamental—Metal Work; Railings, etc. 13

VESTIBULES
Metal, see
—Doors—Entrance 14
—Ornamental—Metal Work 13

VIBRATION ISOLATION
Machinery, see Isolation—Machinery Vibration 10

VIEWING
Cabinets, see Cabinets—X-Ray Viewing 21

W

WAINSCOTING
Acoustical, see Acoustical Materials and Treatment 10
Armored Concrete 11
Art Marble, see
—Art—Marble; Terrazzo—Precast—Wainscoting, Cove Base, Slabs, Trim, etc.; Precast Art Marble 11
Asbestos, see Wallboard—Asbestos Cement; Wallboard—Tiled 11
Asphalt Mastic, see Flooring—Asphalt Mastic 11
Cork Tile Form, see Flooring—Cork Tile Form 11
Fiber Board, see Wallboard—Fiber 10
Magnesite Composition, see Flooring—Magnesite Composition 11
Marble, see
—Art—Marble; Terrazzo—Precast—Wainscoting, Cove Base, Slabs, Trim, etc. 11
—Marble—Interior and Exterior 4
Phenolic Fiber, see Panels—Phenolic Fiber 11
Plywood, see Plywood 8
Porcelain Enameled, see Sheet Metal—Vitreous and/or Porcelain Enameled 13
Rubber Sheet, see Flooring—Rubber Sheet 11
Rubber Tile Form, see Flooring—Rubber Tile Form 11
Soapstone, see Soapstone 4
Structural—Glass, see Glass—Structural 11
Terrazzo, see Terrazzo—Precast 11
Tile, see Tile 11
Veneered, see Panels—Veneered—Wood 11
Wood, see Cabinet Work; Millwork 8
Wood—Fiber, see Mouldings—Fiber 11
X-Ray Protective, see Panels—X-Ray Protective 10

WALL
Base, see Cove Base; Treads; Flooring 11
Base—Art Marble, see Art—Marble 11
Base—Bluestone, see
—Bluestone—Natural 4
—Flooring—Bluestone 11
Base and Electric Conduit—Combination, see Conduit Electrical—Metal Moulding 23
Beds, see Beds—Disappearing or Built-in 21
Cabinets, see Cabinets 27
Coverings, see Specific Type of Covering as Coverings—Wall—Cork; Linoleum; Paper; etc. 11
Facings—Cast Stone 4
Finishes, see Paint 17
Hangers, see Hangers—Beam, Joist, Wall, etc. 3
Paint, see Paint—Wall Finish—Flat, Egg Shell or Gloss 17
Receptacles—Electric, see Receptacles—Electric 23
Ties, see Ties—Wall—Metal 3
Tile, see Specific Kind of Tile 11

WALLBOARD
Acoustical, see Acoustical—Materials and Treatments 10
Aluminum Foil Covered, see Wallboard—Reflective—Aluminum Foil Covered 10
Asbestos—Cement 11
Cement for, see Insulation—House—Setting Cement 10
Fiber 10
Finishes, see Paint 17
Gypsum 9
Gypsum Cork 9
Insulating, see Wallboard—Fiber 10
Joint Finisher 11
Marbleized Finish 11
Metal Covered 10
Mouldings, see Trim—Metal for Panels 11
Non-inflammable, see Specific Type of Wallboard 11
Phenolic Fiber, see Panels—Phenolic Fiber 11
Plywood 8
Reflective—Aluminum Foil Covered 10
Reflective—Non-metallic Pigment 10
Tiled Form 11
Wood Grain Finish 11
X-Ray Proof or Protective 10

WALLS
Ashlar Concrete Masonary, see Concrete—Ashlar Masonary 4
Folding—Fabric, see Partitions—Folding—Fabric Covered and/or Sound Retarding 20
Folding—Wood, see Partitions—Folding—Wood 20
Interior—Interchangeable, see Partitions—Interchangeable Adjustable 20
Interlocking Steel 9
Sectional, see Partitions 20
Vertical Sliding, see Partitions—Vertical Sliding 20

WARDROBES
Blackboard Combination 21
Folding Fronts for, see Partitions—Folding 20
Doors—Rolling—Wood 14
Steel 21
Wood 21
Wood—Receding or Disappearing Door 21

WARMERS
Blanket, see Cabinets—Hospital—Instrument, Warming, Bedpan, etc. 21
Plate—Electric, see Plate—Warmers—Electric 28

WASHBASINS
Porcelain or Vitreous China, etc., see Lavatories 27

WASHERS
Air 26
Automobile 21
Clothes 28
Dish, see Dish—Washers 28
Garbage Can 28
Gas 28
Heel 16

WASHFOUNTAINS 27

WASTE
Burners, see Burners—Garbage 28
Chutes, see Chutes—Garbage or Waste 28
Incinerators, see Burners—Garbage 28
Receptacle 28

WATCHMAN'S
Clock and Tour Systems, see Clock Systems—Watchman 25

WATER
Closet Flush Valves, see Valves—Flush 27
Closet Seats, see Closet—Seats 27
Closet Tank Fittings, see Closet—Tank Fittings 27
Closets, see Closets—Water 27
Coolers—Drinking, see Coolers—Drinking Water 27
Cooling Systems, see Refrigerating—Machinery and Equipment; Ice Making—Machinery and Plants 28
Drinking—Coolers, see
—Fountains—Drinking 27
—Refrigerating—Machinery and Equipment; Ice Making—Machinery and Plants; Coolers 28
Drinking Fountains, see Fountains—Drinking 27
Feeders, see Regulators—Feed Water 26
Filters, see Filters—Gravity or Pressure—Domestic and Industrial 27
Heaters, see Heaters—Water 27
Low Protection for Boiler, see Boiler—Low Water Protector 26
Paint, see Paint—Water 17
Purification, see
—Chlorine—Control Apparatus; Hypochlorite—Control Apparatus 21
—Filters—Gravity or Pressure—Domestic and Industrial 27
Softeners, see Softeners—Water—Domestic and Industrial 27
Stations—Railroad 27
Supply Systems—Hydro-pneumatic or Storage 27
Supply Systems—Non-storage 27
Temperature Regulators, see Controllers—Temperature 26
Treating Equipment 27

WATERPROOF
Lime, see Lime—Waterproof 4

WATERPROOFING
Admixtures 5
Asphaltic, see Waterproofing—Paint and Compounds; Asphalt, etc. 5
Cement Coating 5
Combination Metal Sheet, Asphalt, Felt, etc. 5
Composition Slab or Sheet, see Waterproofing—Protective Course—Composition, Fiber, Asphalt, etc. 10
Contractors 5
Felt, Cloth, Fabric, etc. 5
Integral—Concrete, Mortar, etc. 5
Iron Method 5
Mastic, see Asphalt Emulsion 5
Membrane Method, see Waterproofing—Paint and Compounds; Waterproofing—Felt, Cloth and Fabric 5

WATERPROOFING—Cont.
Paint and Compounds 5
Pre-formed Unit, see Waterproofing—Combination Metal Sheet, Asphalt, Felt, etc.; Waterproofing — Felt, Cloth and Fabric 5
Protection Course—Composition, Fiber, Asphalt, etc. 10
Protective Coatings, see Waterproofing—Felt, Cloth, Fabric, etc. 5
Transparent 5

WAX
Applicator—Wool 17
Floor or Wall—Paste or Liquid 17
Linoleum 17

WAXING
Machines 17

WEATHERSTRIPS
Metal—For Double Hung Windows, Casements, Doors, Transoms, etc. .. 16
Metal—Rubber Combination—Doors, Windows, Refrigerators, Closets, etc. 16
Threshold Combination 16

WEATHERVANES
Metal 13

WELDERS
Automatic—Electric Arc 1

WELDING
Filler Metal 1

WELL HEADS
Stone, Marble 21

WHISTLES
Signal—Steam or Air 25

WHITE
Lead, see Lead—White 17

WICKETS
Bank Grilles, see Grilles and Guards—Bank 20

WIND
Direction Indicators and Recorders, see Weathervanes 13

WINDOW
Blinds, see Blinds; Shades 16
Boxes, see Boxes—Flower 21
Casement Hardware for, see Hardware—Casement Window 16
Cleaners' Safety Devices 16
Closers—Automatic 16
Controls, see Hardware—Window ... 16
Fascias, see Fascias—Window 16
Fixtures—Balances, see Windows—Reversible 16
Fixtures—Reversible, see Windows—Reversible 16
Frames—Wood, see
—Frames—Window 15
—Trim—Wood 8
Glass, see Glass 18
Guards, see Grilles and Guards—Door, Floor and Window 20
Opening Devices, see Operators—Sash 16
Reveal Casings, see Casings—Window—Metal 9
Sash Balances, see Balances—Sash ... 16
Sash Chain, see Chain—Sash 16
Sash Cord, see Cord—Sash 16
Screens, see Screens—Insect 16
Shade Cloth, see Shades—Window—Cloth or Fabric for 16

WINDOW—Cont.
Shade Rollers, see Shades—Window—Rollers for 16
Shades, see Shades 16
Shades — Ventilating, see Shades—Window, Skylight, etc.—Ventilating; Blinds—Venetian 16
Shutters, see Doors—Sheet Metal ... 14
Strips, see Weatherstrips—Metal—for Double Hung Windows, Casements, Doors, Transoms, etc. 16

WINDOWS
Aluminum 15
Art Glass 18
Balanced—Pivoted 15
Balanced—Pivoted—Fixtures for 15
Basement 15
Basement—Wood Frames for, see Frames—Window—Wood 15
Bronze 15
Burglarproof, see Window—Detention 15
Casement 15
Casement—Hardware for, see Hardware—Casement Window 16
Casement Screened, see Screens—Insect 16
Casement—Ventilator Combination .. 15
Closers—Automatic 16
Coal, see Chutes—Coal, Basement or Cellar 13
Cold Storage or Refrigerator 28
Continuous 15
Counterbalanced 15
Detention 15
Detention—Screened 15
Donovan 15
Double Glazing 15
Double Glazing—Panels 15
Double Hung, see Windows—Hollow Metal; Windows—Metal Covered; Windows — Steel; Windows—Bronze; Windows—Wood; Windows—Aluminum 15
Farm Building 21
French, see
—Doors—Casement 14
—Windows—Casement 15
Hollow Metal 15
Information 20
Insulating, see Windows— Double Glazing 15
Metal Covered 15
Monitor, see Windows—Continuous. 15
Office—Projected, see Windows—Projected—Architectural; Windows—Projected—Commercial 15
Ornamental, see Ornamental—Metal Work 13
Pantry—Revolving 14
Pivoted 15
Pivoted—Screened 15
Projected—Architectural 15
Projected—Commercial 15
Projected—Ornamental 15
Reversible—Double Hung 15
Reversible—Hardware for, see Hardware—Reversible Window 16
Security, see Windows—Detention .. 15
Show Disappearing Platforms for 15
Stained Glass, see Glass—Leaded ... 18
Steel 15
Steel—Inserts for 15
Store Front, see
—Specific Type of Window 15
—Store Front—Construction 19
Storm, see Sash—Storm 15
Tilt-in, see Windows—Reversible—Double Hung 15
Underwriters, see Specific Type of Window 15
Wood 15
Wrought Iron 15
X Ray Protective 10

WINE
Racks 28

WIRE
Aluminum 13
Beam Caging, see Caging—Wire 3
Brass, Bronze, Copper, Nickel, Silver, etc. 13
Cloth, see Screen Cloth 16
Concrete Reinforcement, see Concrete—Reinforcement—Wire Mesh ... 3
Enclosures, see
—Fences and Fencing—Chain Link 21
—Partitions—Open Mesh 20
Fencing, see Fences and Fencing—Chain Link 21
Lath, see Lath—Wire; Concrete Reinforcement 9
Mesh, see Concrete Reinforcement—Wire Mesh 3
Partitions, see Partitions—Open Mesh 20
Picture, see Art Gallery—Fittings ... 21
Reels 16
Rope, see Rope—Wire 22
Shaft—Access—Door for, see Doors—Access 27
Signs, see Signs—Wire 20
Snow Guards, see Guards—Snow 6
Steel Alloy 13
Work 20
Woven, see Metal Fabric—Woven .. 26

WIRE AND CABLES—ELECTRIC
Asbestos—Insulated 23
Asbestos—Range, Heaters, etc. 23
Cambric Covered—Annunciator, Bell Telephone, etc. 23
Channel, see Conduit—Electrical 23
Flexible—Non-metallic 23
Flexible—Steel Armored 23
Lamp and Portable Cord 23
Lead Incased 23
Paper Insulated—Lead Covered, see Wire and Cables—Electrical—Lead Encased 23
Parkway 23
Rigid, see Conduit—Electrical 23
Rubber Covered—Interior Light and Power Wiring 23
Rubber Covered—Telephone 23
Service Drop and Entrance Cable, see Wire and Cables—Electrical—Lead Encased 23
Systems for 23
Telephone—Planning for, see Telephone—Service—Public 25
Theater or Stage Cable 23
Underground—Lead Incased 23
Varnished Cambric 23
Weatherproof and Slow Burning 23

WIRING CHANNEL 23
Lamp Outlets 24

WIRING DEVICES
Electric 23
Radio 23

WOOD
Artificial, see Specific Products as: Wallboard — Wood Grain Finish; Wallboard—Asbestos-Cement ... 11
Blocks—Creosoted or Treated, see Flooring—Wood Block—Creosoted or Treated 11
Blocks—Flooring and Paving, see Blocks—Wood—Flooring and Paving 11
Blocks—Untreated, see Flooring—Wood Block—Natural or Untreated 11
Cabinet Work, see Cabinet Work—Wood 8
Door Frames, see Trim—Wood 8

WOOD—Cont.
Doors, see Doors—Wood; Doors—Veneered 14
Dyes, see Stains—Wood 17
Fencing, see Fences and Fencing—Wood and/or Woven Wood 21
Fillers, see Fillers—Wood 17
Finishes, see Varnish; Enamel; Paint; Stains; Lacquer, Wax, etc. 17
Fire Retardant, see Lumber—Fire Retardant Treatment 8
Flooring, see Flooring 11
Flooring and Paving — Creosoted or Treated, see Flooring — Wood—Creosoted or Treated 11
Flooring and Paving—Natural, see Flooring—Wood Block — Natural or Untreated 11
Native, see Lumber 8
Plywood, see Plywood 8
Preservatives, see Preservatives — Wood 8
Shingles, see Shingles—Wood 6
Tongued and Grooved—Parquetry, see Flooring—Wood Block — Tongued and Grooved—Parquetry 11
Trusses, see Trusses—Wood 3

WOOD—Cont.
Veneer, see Panels — Veneered — Wood 11
Veneer—Cloth Backed, see Coverings —Wall — Cloth Backed Wood Veneer 11
Wall Coverings, see Panels—Veneered Wood 11
Veneers—Wood 8
Work, see Cabinet Work—Wood; Trim—Wood 8

WOOL
Mineral or Rock, see Insulation—House—Wool 10

WOVEN
Metal Fabric, see Metal Fabric—Woven 26
Wood Fence, see Fences and Fencing —Wood and/or Woven Wood ... 21

WRAPPING
Beam, see Caging—Wire Beam, Girder and Column 3

WRINGERS
Clothes, see Laundry—Equipment and Machinery 28

WROUGHT IRON WORK
Gates, Grilles, Railing, etc., see Ornamental—Metal Work 13

X

X-RAY
Doors, see Doors—X-Ray Protection. 10
Equipment 23
Film Safety Storage, see Cabinets—X-Ray Film Safety Storage 21
Film Transfer Boxes, see Cabinets—X-Ray Film Transfer 21
Paint, see Paint—X-Ray 10
Protective Material 10
Protective Louvers, see Louvers—X-Ray Protection 10

Z

ZEOLITE
Water Softeners, see Softeners—Water—Domestic and Industrial .. 27
ZINC
Oxide, see Paint—Metal Protective .. 17
ZONE
Control, see Controls—Air Conditioning 26

SERVICES AND WORK EQUIPMENT
- SECTION - 1

Section Number 1/5 Catalog Number

CATALOGS 1 to 4

MANUFACTURERS

THIS INDEX INCLUDES ONLY MANUFACTURERS WHOSE CATALOGS ARE FILED IN THIS SECTION

Architectural Record, see Dodge, F. W., Corp. 1/4
Dodge, F. W., Corp. 1/4
Dodge Reports, see Dodge, F. W., Corp. 1/4
Dodge Statistical Research Service, see Dodge, F. W., Corp. 1/4
Home Owners Catalogs, see Dodge, F. W., Corp. 1/4
Hunt, Robert W., Co. 1/1
Parker Rust-Proof Co. 1/3
Pittsburgh Testing Laboratory 1/2
Sweet's Catalog Service, see Dodge, F. W., Corp. 1/4

PRODUCTS

THIS INDEX INCLUDES ADDITIONAL INFORMATION WHICH IS FILED IN OTHER SECTIONS

Products described or illustrated in manufacturers' catalogs are indexed by section and catalog numbers. All names are listed alphabetically under each product heading.

ACETYLENE
for Welding
See Welding—Accessories and Supplies

BORINGS
Test—Foundation
Hunt, Robert W., Co. 1/1
MacArthur Concrete Pile Corp. .. 2/1
PTL 1/2
Pittsburgh Testing Laboratory .. 1/2
Raymond Concrete Pile Co., Inc. 2/2
Spencer, White & Prentis, Inc. 2/3
Specifications 1/1

CARBIDE
for Welding
See Welding—Accessories and Supplies

CAULKING
Guns
See Guns—Caulking

CEMENT
Testing
See Inspection and Testing—Structural Materials, Efficiency, etc.

CHAPLETS
Foundry
See 16/102

CLEANING
Building Exteriors
Structural Waterproofing, Inc. .. 5/21

CONCRETE
Reinforcement—Testing of
See Inspection and Testing—Structural Materials, Equipment, Efficiency, etc.

Restoration
Resto-Crete 5/27
Western Waterproofing Cos. 5/27

CONTRACTORS
Industrial Plant
Rust Engineering Co. 26/130

CUTTING
Apparatus—Acetylene, Oxygen, etc.
See Welding—Accessories and Supplies
Machines—Tile
Kraftile Co. 11/3

DERRICKS
See 3/3

DREDGES
See 3/3

DRILLS
Core
See 26/32
Masonry
Paine Co. 16/45
Rawldrills 16/46
Rawlplug Co., Inc. 16/46
Star 16/45
See also 26/32

DRIVERS
Pile
See 26/32

ENGINEERS
Consulting
Hunt, Robert W., Co. 1/1
PTL 1/2
Pittsburgh Testing Laboratory .. 1/2
Research Corp. 26/19
Industrial Plant
Rust Engineering Co. 26/130
Soil Testing
Hunt, Robert W., Co. 1/1
PTL 1/2
Pittsburgh Testing Laboratory .. 1/2
Raymond Concrete Pile Co., Inc. 2/2
Spencer, White & Prentis, Inc. 2/3

FILLER
Metal
See Welding—Electros

GALVANIZING
Work
See 3/3

GUNS
Caulking
Minwax Co., Inc. 5/16
Pecora Paint Co., Inc. 18/14

HOISTS
Pneumatic or Electric
See 26/32

INSPECTION AND TESTING
Structural Materials, Equipment, Efficiency, etc.
Hunt, Robert W., Co. 1/1
PTL 1/2
Pittsburgh Testing Laboratory .. 1/2
Specifications 1/1

JACKBITS
See 26/32

JACKHAMMERS
See 26/32

MACHINES
Grooving
Alumo 16/69

PAVING
Breakers
See 26/32

PENCIL
Lead
Old Faithful 17/35

PLANES
Hand
Alumo 16/69

PRESERVATION OF BUILDING EXTERIORS
See Restoration and Preservation Building Exteriors

RESTORATION AND PRESERVATION

Building Exteriors

(See also Concrete—Restoration)

Billings-Chapman Co. 5/8a
Driwal 5/8a
Minwax Co., Inc. 5/16
Resto-Crete 5/27
Rust Engineering Co. **26**/130
Structural Waterproofing, Inc. ... 5/21
Western Waterproofing Cos. 5/27
Specifications 5/8a

RODS AND BARS

Welding

See Welding—Electrodes

RUSTPROOFING

Metals

Bonderizing 1/3
Parker Rust-Proof Co. 1/3
Parkerizing 1/3

SANDBLASTING

See Cleaning—Building Exteriors

STONE PRESERVATION

See Restoration and Preservation—Building Exteriors

STRUCTURAL

Steel—Inspection of

See Inspection and Testing—Structural Materials

TESTING

Borings

See Borings—Test—Foundation

Equipment; Efficiency

See Inspection and Testing—Structural Materials; Equipment; Efficiency; etc.

Structural Materials

See Inspection and Testing—Structural Materials; Equipment; Efficiency; **etc.**

TOOLS

Hand

See **26**/32

Pneumatic

See **26**/32

WELDERS

Automatic—Electric Arc

Flexarc **23**/16
Westinghouse Electric & Mfg. Co. **23**/16

WELDING

Electros

Enduro **13**/5
Plumrite **27**/8
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Consultation in the various fields of engineering: Civil, Mechanical, Electrical, Hydraulic, Chemical, Metallurgical and Mineral Industries.

Research on building materials.

Soil tests and test borings to determine permissible loads per square foot and the probable ultimate settlement under load.

Investigations and tests to determine the existing condition and safety of both old and new structures.

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CEMENT AND CONCRETE INSPECTION

Cement is sampled in car load or bin lots at the mills or warehouses or when delivered on the work, each lot being identified with serially numbered tags. These samples are tested in accordance with American Society for Testing Materials requirements or as specified.

Concrete aggregates are analyzed to determine suitability for construction purposes.

Concrete cylinders are cast and tested to check the designed mix, to determine the quality of concrete and for job control to assure safety in the removal of forms and economy in their use.

Supervision during construction of reinforced concrete, mass concrete and fireproof concrete structures includes analysis of concrete materials and the design of the concrete mix, check of the mixing operations, checking the alignment and construction of forms and the proper placing of reinforcements and supervision of the curing of concrete under abnormal weather conditions.

Special tests and investigations to determine permissible loads on floor panels and individual concrete members.

Concrete failures investigated to determine the cause of failure and recommend corrections.

STRUCTURAL STEEL INSPECTION

Inspection of structural material at the mills and foundries, including identification and witnessing of physical tests.

Supervision and inspection of workmanship, checking the sections, dimensions and detail connections during fabrication at the shops, assuring the proper handling of material, first class workmanship, accurate construction, thorough painting and distinct marking, thus facilitating erection at the site.

Supervision and detail inspection of the structure during erection.

Welding of structural materials inspected in detail at the fabricating plant and during erection of the structure. Our laboratories are equipped for procedure control of welders.

Reinforcing steel is inspected and tested at mill or warehouse as required and tagged for identification.

Estimation of weights from detail drawings, and checking shipped weights of finished work.

Bank vault materials and workmanship inspected and tested at the several points of manufacture and the installation at the building carefully supervised to assure proper assembly and satisfactory operation.

SPECIFICATION FORMS

Structural Steel—Shall be tested and inspected at the mill, fabricating shop, and during erection.

Reinforcing Steel—Shall be tested and inspected at the mill or warehouse before shipment to the site.

Cement—Portland cement shall conform to the latest Standard Specifications and tests for Portland Cement of the American Society for Testing Materials. Tests shall be made on individual samples. Bags sampled to be tagged for identification.

Aggregates—The Testing Engineer shall run sieve, decantation and organic tests on both fine and coarse aggregate after the material has been delivered to the job and as often as, in his opinion, it is necessary.

Placing of Concrete—The Testing Engineer shall be present at all times during the mixing and placing of concrete; he shall be in direct control of its quality and shall be responsible directly to the architect, or whomever he may designate.

Testing Engineer—Wherever testing and inspection of materials and supervision of construction is mentioned in these Specifications, it is understood that the work is to be performed by Robert W. Hunt Company, who are hereby appointed for this service.

MEMORANDA

PITTSBURGH TESTING LABORATORY

Inspection and Testing of Materials and Appliances Used in Building Construction—for Architects, Contractors, Owners

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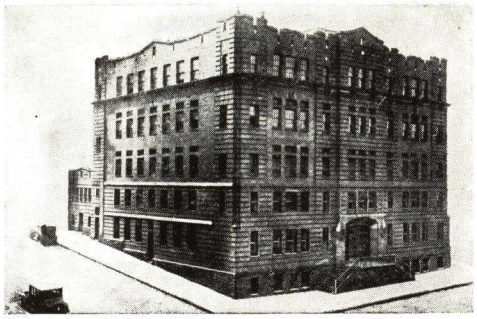

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FIFTY-EIGHT YEARS OF SERVICE TO THE BUILDING INDUSTRY

PITTSBURGH TESTING LABORATORY has been serving the building industry for over half a century through its inspection and testing services. With its own organization and affiliates PITTSBURGH TESTING LABORATORY covers the entire country—no matter where materials or appliances are manufactured, a PTL inspector is near at hand, ready to render service on a day's notice.

PITTSBURGH TESTING LABORATORY is not only prepared to make inspections and conduct tests, but also, as a result of long and varied experience, is in a position to offer helpful suggestions to architect, builder and owner, in the preparation of unusual specification clauses pertaining to this class of service—suggestions that may save needless expense.

PITTSBURGH TESTING LABORATORY IS PREPARED TO INSPECT AND TEST

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Insulating Materials, Windows
Lumber, Timber and Treating
Paints and Paint Materials
Plaster and Plastering Materials
Pipe and Fixtures
Sewer Pipe and Drain Tile
Steel Fabricating, Riveting, Welding

HOW TO SPECIFY INSPECTIONS AND TESTS

Any of the following clauses may be used:

All materials and equipment shall be subject to inspection at all times by the architect or his duly appointed agent. The cost of inspections and tests, unless otherwise provided for by standard specifications, shall be borne by the owner.

(or) All materials and equipment shall be subject to inspection at all times by the architect or his duly appointed agent. The cost of inspections and tests, unless otherwise provided for by standard specifications, shall be borne by the contractor, who shall set up in his bid a figure sufficient to cover the cost of doing the work, based upon fair and equitable fees named by the architect.

(or) All materials and equipment shall be subject to inspection at all times by the architect or his duly appointed agent. The cost of inspections and tests, unless otherwise provided for by standard specifications shall be borne by the contractor, who shall set up in his bid a figure sufficient to cover the cost of doing the work, based upon fair and equitable fees named by the architect. If it is found that the amount set up by the contractor is not sufficient to cover the cost of all inspections and tests desired, the owner will pay the additional cost as an extra. If the amount is found to be more than sufficient, the difference will be returned to the owner by the contractor.

THE PARKER RUST-PROOF COMPANY

DETROIT, MICHIGAN

PARKER PROCESSES FOR FINISHING IRON, STEEL AND ZINC FOR PAINT ADHESION AND PROTECTION AGAINST RUST

Keeping pace with modern developments in the building field, advances have been made in protective finishes for the iron, steel and zinc units used in architecture.

For nearly a quarter of a century the Parker Processes have been used successfully by architects and owners on metal work to protect it from rust, give it a finer appearance and avoid unnecessary reconditioning expense. Constant research has created new and better Parker Processes, widening their field of usefulness, extending their application to new products and increasing their rust-proofing effeetiveness.

Research has simplified methods of application, shortened processing time and adapted them to mass production methods and reduced the cost. They are the world's best known chemical methods for rust control and provide a plus service for the building owner on iron, steel or zinc units that are exposed to weathering or humidity.

BONDERIZING

Bonderizing has attained worldwide acceptance as an economical and efficient rust-inhibiting base for paint finishes. The processing chemically produces a non-metallic phosphate coating of a crystalline structure, which is integral with the metal itself. As paint, enamel or lacquer is applied to this surface, a portion of the fluid material flows into the interstices between the crystals and as the paint hardens it becomes securely bonded to the metal.

The effectiveness of Bonderizing on metal that is to be exposed to either weather or inside moisture is a well-known and demonstrated fact. Carefully conducted tests prove that paint finish over properly applied Bonderizing increases finish durability and retains finish appearance anywhere from three to five times longer than the same finish over bare metal.

In addition to its paint holding and rust preventing qualities, Bonderizing stops the spread of rust around accidental injuries to the finish. If the finish is scratched or abraded through to bare metal, rust will form on the exposed surface. Bonderizing being a non-conductor of electricity, the spread of rust to the surrounding area by electro-chemical activity is prevented.

PARKERIZING

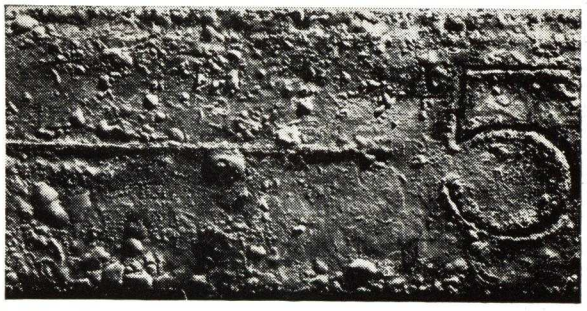
The coating produced by Parkerizing is of the same general character as Bonderizing. The method of producing the coating, however, varies slightly and the surface change in the production treated varies sufficiently to permit different types of finish, including air dried paints, which is the type of finish recommended for Parkerized products in practically all architectural uses.

For Zinc surfaces: The difficulty of making paint adhere to zinc surfaces, such as galvanized steel, is well known. Such surfaces can be Parker Processed, producing an excellent base for paint. Paint coatings, over Parker Processed zinc surfaces are firmly anchored to the metal, for great durability and excellent protection from chipping or peeling.

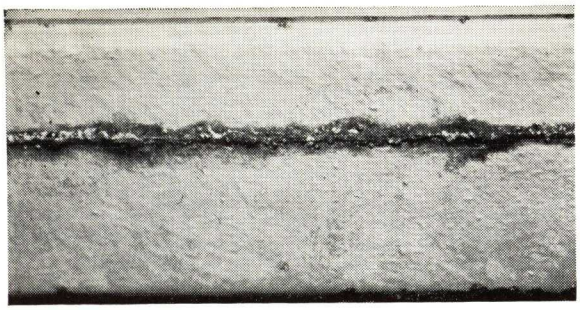
Effect of Parker Processing on Iron or Steel

In addition to years of satisfactory use, under all sorts of atmospheric conditions, various accelerated tests have been made to quickly demonstrate the value of Parker Processes. The results of two tests by the salt spray are illustrated herewith.

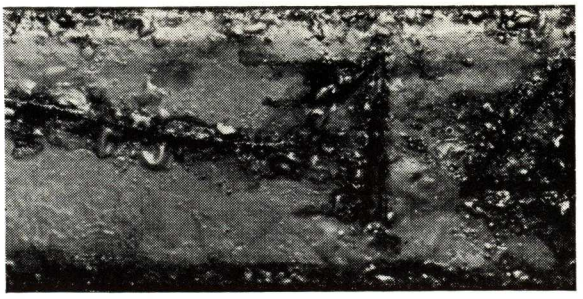
Steel Sash section, Bonderized and one factory coat of baking paint, subjected to salt spray for 625 hours. There is little if any evidence of paint failure, outside the area of the test scratch.



Similar section of steel sash with two coats of baking paint on bare steel, exposed to salt spray for 625 hours. The surface is covered by rust pits and blisters. Finish has failed badly.



Section of steel sash Bonderized and finished with one factory coat of baking paint plus one field coat of paint. Exposed to salt spray for 841 hours. Evidence of paint failure is slight, except at exposed metal in test scratch and discoloration caused by rust running away from test scratch.



A similar section of steel sash finished with two coats of baking paint over bare metal, plus one field coat of paint. Exposed to the salt spray for 841 hours. Blistering of paint is pronounced along edges of bar and wide areas adjacent to test scratch. Rust pits and blisters are evident. Finish has failed.

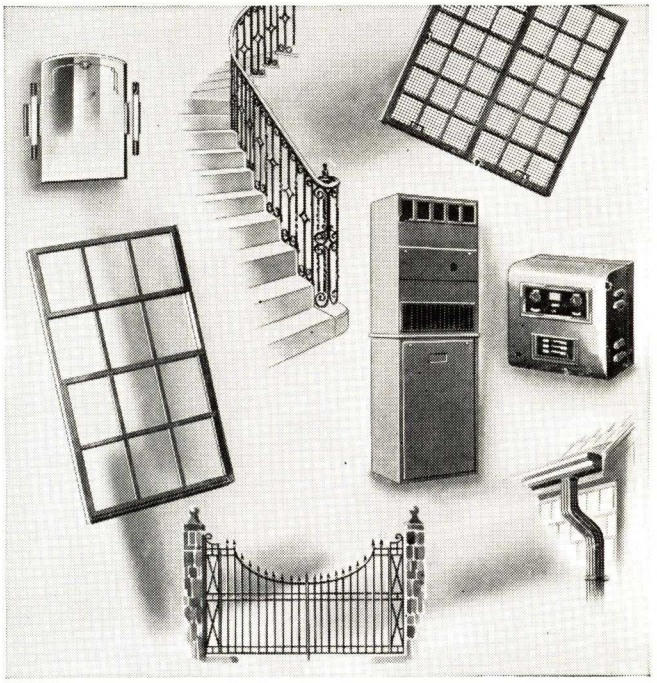
ARCHITECTURAL PRODUCTS OF MANY KINDS ARE PARKER PROCESSED

Since Parker Processing was first introduced it has been of unusual interest to builders, because it offered a solution to one of their pressing problems—protecting costly iron work from the elements.

Bonderizing is used by leading manufacturers of steel windows, air-conditioning equipment, elevator cabs, screen frames, bath room cabinets, galvanized sheet steel for eave troughs and down spouts, as well as scores of other building units.

As the effectiveness of Parker Processing has become fully established there is hardly a notable building erected today that will not include some type of equipment that has the benefit of Parker protection, either knowingly specified by architect or builder, or through the installation of units Parker Processed by the manufacturer, because of his reliance on this type of finish to give his product outstanding merit.

Parker Processes provide an invisible quality, but time and exposure will demonstrate their value through lasting fine appearance and longer finish life. With a Parker finish the owner is relieved of annoying and disfiguring rust development as well as too frequent reconditioning expense.



A FEW PROMINENT USERS OF PARKER PROCESSES ON BUILDING MATERIALS

In considering the value of Parker Processes, it is significant that the largest and most progressive producers in the industries making iron and steel building materials are consistent users. These manufacturers adopted a Parker Process only after checking, testing and proving its rust-proofing value on their particular product.

Air Conditioning
Airtemp, Inc., Dayton, Ohio.
Air Devices Corporation, Meriden, Conn.
Standard Air Conditioning Co., New Rochelle, N. Y.
Tuttle & Baily, New Britain, Conn. (Air Conditioning Grilles)
York Ice Machinery Corporation, York, Pa.

Bath Room Cabinets
Faries Manufacturing Co., Decatur, Illinois.
Hess Warming & Ventilating Co., Chicago, Illinois.

Elevator Cabs
Otis Elevator Co.. New York, N. Y.

Garage Door Equipment
Rowe Manufacturing Co., Galesburg, Illinois.

Galvanized Sheets (Parker Processed)
American Rolling Mill Co., Middletown, Ohio.

Steel Windows
Wm. Bayley Co., Springfield, Ohio.
Campbell Metal Window Corporation, Baltimore, Md.
Detroit Steel Products Co., Detroit, Michigan.
Soulé Steel Company, San Francisco, Calif.
Truscon Steel Co., Youngstown, Ohio.

Switch, Meter and Starter Boxes
Allis-Chalmers Mfg. Co. (Condit Works) Boston, Mass.
Bailey Meter Co., Cleveland, Ohio.
Sangamo Electric Co., Springfield, Illinois.
Warren Webster & Co., Camden, N. J.

Window Screens
Chamberlin Metal Weatherstrip Co., Detroit, Mich.
Johnson Metal Products Co., Erie, Pa.

Metal Doors
Dahlstrom Metallic Door Co., Jamestown, N. Y.

Metal Partitions & Metal Wall Board
Martin-Parry Corp., York., Pa.

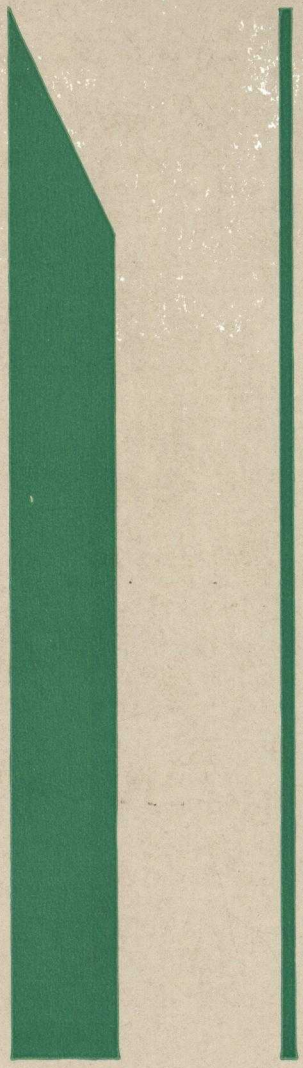
Domestic Water Heaters
Pittsburgh Water Heater Co., Pittsburgh, Pa.

Builders Hardware
P. & F. Corbin Division, American Hdw. Corp., New Britain, Conn.
Yale & Towne Mfg. Co., Stamford, Conn.
Norwalk Lock Co., Norwalk, Conn.
Southington Hdw. Co., Southington, Conn.
Eagle Lock Co., Terryville, Conn.

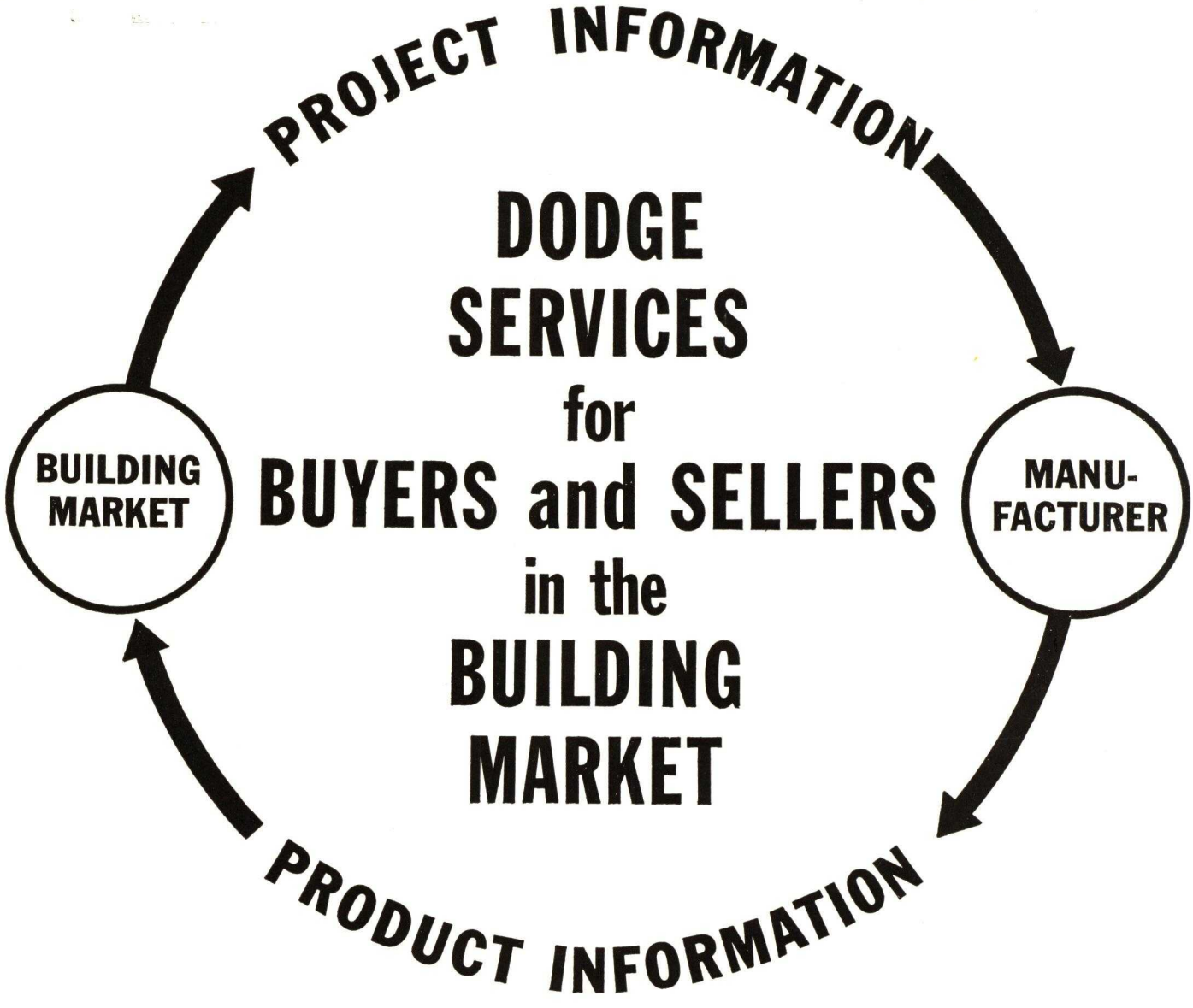
MEMORANDA

BUILDING MARKET

PUBLICATIONS *and* SERVICES



F. W. DODGE CORPORATION


PROJECT INFORMATION
DODGE
SERVICES
for
BUYERS and SELLERS
in the
BUILDING
MARKET
BUILDING MARKET
MANU-FACTURER
PRODUCT INFORMATION

DODGE PUBLICATIONS AND SERVICES

All DODGE publications and services have been designed to serve the needs of architects, engineers, contractors, owners and manufacturers and their representatives by making the operations of planning, specifying, contract letting, buying and selling easier, more effective and economical. Each is basically a communication service, to expedite the exchange of information between the buying and the selling groups and between the individual members of each. Their application to the many and varied needs of the building industry is described in the following pages.

DODGE REPORTS — PAGES 4-9

Individual daily reports of planning and work progress on specific building projects, giving type of building, location, valuation, ownership, professional personnel and other pertinent data of value to sales organizations.

DODGE STATISTICAL RESEARCH SERVICE — PAGES 10-11

Compiles contract award data on construction started in 37 states east of the Rockies. Data distributed in bulletin form for thirteen geographical areas, by states and metropolitan areas. Data also available for individual counties.

HOME OWNERS' CATALOGS — PAGES 12-13

Cloth-bound volumes of descriptive, illustrated, product catalogs of firms selling to the "owner-to-occupy" residential field. Distributed territorially, to owners who are planning to build or modernize homes for their own occupancy.

SWEET'S CATALOG SERVICE — PAGES 14-17

Prepares, distributes and maintains files of manufacturers' catalogs in bound-volume form, in 14,500 offices of architects, engineers, contractors and other important buyers and specifiers of building products.

ARCHITECTURAL RECORD — PAGES 18-21

A monthly magazine edited expressly for the building designer. In addition to presenting Building News and Design Trends, it provides each month standards of performance for Building Types, designed to be used with Sweet's Catalog File as an efficient work-tool.

F. W. DODGE CORPORATION

119 West 40th Street, New York, N. Y.

FOR LIST OF DISTRICT OFFICES SEE INSIDE BACK COVER

DODGE REPORTS

A Daily Construction News Service

When Frederick W. Dodge founded his daily construction news service in 1891, he inaugurated a system of gathering and issuing news which has endured for 48 years and has expanded to the largest news service of its kind in the world —in size of organization and number of subscribers. Dodge news has followed the trends of those changing years, without a day's interruption in service. The principles of the founder still guide us in our day-to-day contacts with architects and other sources of information, as well as the firms who use the news to help them sell more economically in the widespread construction market.

DODGE REPORTS continues as the dependable daily news service which gives the important information about current and contemplated work on individual building and engineering projects throughout the 37 states east of the Rockies.

The following pages have been designed to give complete and graphic descriptions of the gathering and preparation of our news, its distribution to our subscribers, the uses to which it is put and the advantages of DODGE REPORTS to the architectural profession and the construction field in general.

DODGE REPORTS DEFINED AND DESCRIBED

DODGE REPORTS provides daily news about the individual building and engineering projects of the 37 eastern states. Normally, this area accounts for about 91 per cent of the country's construction volume.

DODGE REPORTS are mailed from fifteen Issuing Offices, every day. They are delivered to individual subscribers during the next day. The thousands of DODGE REPORTS subscribers represent more than 700 different lines of business. All of them sell in the large and widespread construction market.

DODGE REPORTS includes news about privately and publicly financed projects, new and alteration work, and additions. The names and addresses of owners, architects, engineers and contractors are given. The location, status and structural description of each job are completely noted.

There is a series of DODGE REPORTS on every project, as illustrated on page 6, not just a single REPORT. From the time the first news is issued, subsequent REPORTS give later information, by stages, as soon as it is available.

Only one project is included on a REPORT. The individual slip-size is 6 x 3⅛ inches (see bottom of page 9).

WHO GATHERS THE NEWS — AND HOW

A staff of more than 750 reporters gathers the news which appears in DODGE REPORTS. These reporters verify every item which appears in DODGE REPORTS by contacting a responsible person who is connected directly with each job.

About 138,000 different news sources are called upon by the Dodge staff. These include owners, architects, engineers, contractors, financial institutions, real estate brokers and all others who are able to give some authoritative information of value to Dodge subscribers. These reliable sources are contacted at regular intervals, many of them daily. More than 1,225,000 personal calls and about 820,000 telephone calls are made on these news sources each year by the Dodge news-staff.

In Washington, a special corps of Dodge reporters is in constant communication with every federal department and bureau at which construction news will originate.

A Dodge reporter is present at every important bid-opening to get that spot-news to his Issuing Office before the day's "deadline".

All reporters rush their latest news-finds to Issuing Offices by telephone, telegraph, teletype, special delivery and air-mail. Dodge news is carefully edited before it is issued to subscribers.

No effort is spared to speed dependable construction news from source-to-subscribers in DODGE REPORTS. They are as complete, accurate, and up-to-the-minute as men, money, machines and mail can make them.

These eleven reporters, part of the Chicago staff, are typical of the Dodge reporters throughout the country. Each one is especially trained for his work and his territory.

THE ARCHITECTS AND DODGE REPORTS

A friendly spirit of understanding and cooperation has been built up between architects and Dodge reporters. This has grown through the years as the reliability and value of all Dodge services to architects have become more and more apparent. There is a rigid rule which is enforced throughout the news-staff: *Never violate an architect's confidence.*

DODGE REPORTS serves the architects in the capacity of *time savers.* News about current projects, when distributed to the construction industry in DODGE REPORTS, will help salesmen and contractors to make their calls most effective for the architect and themselves.

When it is clear in a REPORT that a particular project will not require certain products, or the services of some trades, salesmen of those products and services will realize that calls in such cases will waste their time and that of the architects.

On the other hand, modern sales-service in the construction field will lead cooperative, helpful and practical representatives to the architects who might find good use on current projects for their information and services.

This procedure helps architects save the time which would be taken up by many bothersome, routine inquiry calls, and at the same time, assures them of the sales-service which can be applied to the jobs on the boards.

In addition to the benefits which accrue directly to the architects, DODGE REPORTS has a wider economic value. Here the architects find indirect, but worthwhile benefits.

Dodge news of interest to the firms selling in the construction market, definitely tends to reduce the selling and distribution costs of materials and equipment. This has an important influence on the volume of new construction.

If each manufacturer, distributor, retailer and contractor in the construction field were to make individual efforts to find the information which is in Dodge news, every day, he would spend his equivalent of the *hundreds of thousands of dollars* which Dodge now spends to find and distribute that news. Such a large expense for prospect-finding would be reflected in higher consumer costs. Now, Dodge spends *all* of that money and distributes the necessary information to these firms at a small fraction of the original cost.

In these ways, DODGE REPORTS helps the construction industry reduce selling costs—that means lower prices for building materials and equipment—and consequently encourages more building.

Comments on Dodge Services by Architects

JOHN W. BEAL, ARCHITECT
J. WILLIAMS BEAL, SONS
BOSTON

"Having ascertained from actual experience that Dodge Reports are an unexcelled medium for the distribution of information to both contractors and sub-contractors, we are glad to express our appreciation of your service and state our willingness to cooperate with you at all times. . . . Our experience is that the plan room which you maintain for the use of contractors is most helpful not only to us as architects as it saves the confusion of many contractors and sub-contractors visiting our office during busy periods, but to the contractors as well who explain to us that it saves them much time in obtaining the necessary information for estimating. . . . We believe that the Dodge Reports and the plan room service are of inestimable value to both the architect and contractor and are deserving of every consideration."

ROY W. BANWELL, A.I.A.
ASSOCIATE IN OFFICE OF
W. POPE BARNEY, A.I.A.
PHILADELPHIA

"Dodge Reports seems to be essential to builders and useful to architects. The more complete your coverage becomes, the fewer are the office inquiries from people who want information about a job and its specifications . . . Your plan room service should be useful to estimators and architects. Our experiences with it have been very satisfactory."

F. E. BERGER, ARCHITECT
BERGER & KELLEY
CHAMPAIGN, ILLINOIS

"We would like to comment on the value of your plan room service which we have used on all of our larger work for a number of years. We find that this service gives us a wide field of high class competition which would not otherwise be available. For like reasons we are always glad to give your representative full information on all of our projects to be published in Dodge Reports."

ELY JACQUES KAHN, F.A.I.A.
NEW YORK

"It has been of interest to this office to cooperate with your service by giving, as promptly as possible, full information on jobs handled by this firm. . . . It is our belief that by presenting reliable data as soon as practicable, the various contractors and sub-contractors who would be interested, are made aware of what is in prospect and we have gained valuable information from them as to their materials, methods of application, as well as cost."

L. ROSSETTI
GIFFELS & VALLET, INC., L. ROSSETTI
DETROIT

"Recognizing Dodge Reports as a reliable medium for the distribution of information to contractors and material men, we are always glad to give you information on projects in this office. . . . These reports save us and salesmen calling on us, valuable time by stating correctly the status of work in our office. We also find your Plan Room Service very helpful in securing estimates and bids on our work.

HOW DODGE REPORTS ARE USED

What happens to the news items which architects and engineers give to Dodge reporters? Naturally, the answer to that question is of interest to the sources of Dodge news.

Briefly, DODGE REPORTS are designed to function in three separate selling capacities. *First*, they are used by salesmen and contractors in their day-to-day field work. *Second*, managements use them as sales control files. *Third*, they prompt more effective distribution of direct mail advertising.

FIELD SELLING—DODGE REPORTS is a constantly up-to-the-minute guide to the live selling opportunities in each salesman's and contractor's territory. The REPORTS analyze the selling opportunities in terms of *which jobs, whom to see, where to see them*, and *when to see them*. Such information takes the "wandering" out of a sales day. The salesmen and contractors avoid the discouragement of fruitless calls; they increase their own earnings by concentrating on live jobs. Employers are saved the cost of waste calls. Architects are spared the interruptions and annoyance of those calls.

A knowledge of the use of Dodge news is important to the architects, as well as the subscribers. Under the heading, "The Architects and Dodge Reports," it was pointed out that the use of Dodge news by the subscribing firms materially helps them lower consumer prices through economies in sales and distribution expenses. In turn these more attractive prices induce a generally greater construction activity.

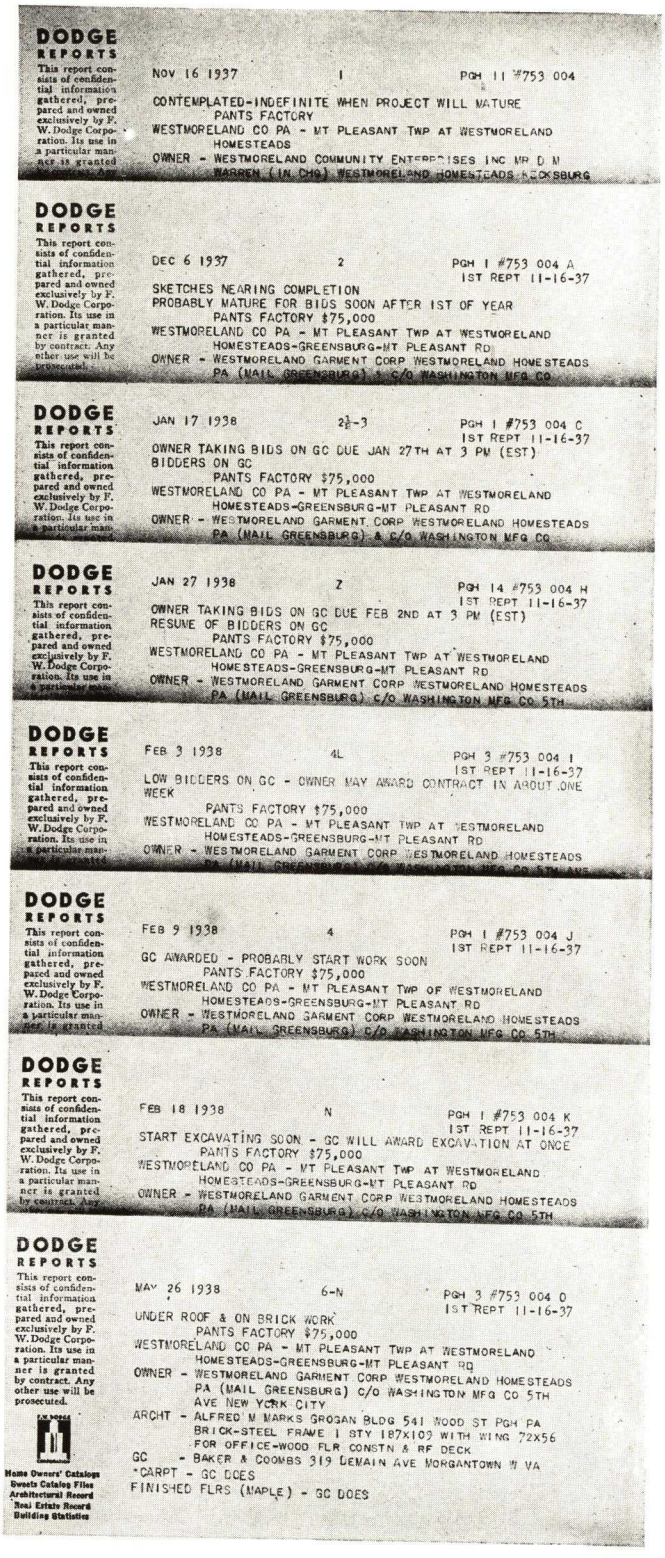
SALES CONTROL—DODGE REPORTS provides the basis for accurate, day-by-day control files which enable management to direct salesmen's activities on individual jobs. Those files give clear and timely pictures of each trading area or sales territory, in terms of actual jobs. Sales control files help the manufacturers to lower selling costs with consequent benefits for all.

Control files provide for sales direction in cases where jobs are neglected; when salesmen need out-of-town help; when jobs are split between an architect in one territory, a contractor in another and possibly an owner in a third.

TIMED DIRECT ADVERTISING—A system of coding on DODGE REPORTS makes it possible for advertising and promotional departments to send direct mail advertising to the buying and specifying factors for individual jobs, at exactly the time when specifications are being written or just before orders will be placed. This *timed* distribution of costly printed pieces can be handled economically and eliminates the waste in broadcast methods of distribution.

Timed distribution of advertising fortifies, or calls attention to other forms of advertising. A folder to an architect can call his attention to a catalog filed in *Sweet's* or, in the case of home building, it will call an owner's attention to the value of architectural services and a catalog in *Home Owners' Catalogs*.

The three separate sales functions of DODGE REPORTS have been coordinated in the *New Dodge Method of Straight Line Selling*. A Dodge representative will be glad to explain the proper use of this method in the construction market.



DODGE REPORTS

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Nov 16 1937 — 1 — PGH 11 #753 004

CONTEMPLATED-INDEFINITE WHEN PROJECT WILL MATURE
PANTS FACTORY
WESTMORELAND CO PA - MT PLEASANT TWP AT WESTMORELAND HOMESTEADS
OWNER - WESTMORELAND COMMUNITY ENTERPRISES INC MR D M WARREN (N CHG) WESTMORELAND HOMESTEADS ROCKSBURG

DODGE REPORTS

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DEC 6 1937 — 2 — PGH 1 #753 004 A 1ST REPT 11-16-37

SKETCHES NEARING COMPLETION
PROBABLY MATURE FOR BIDS SOON AFTER 1ST OF YEAR
PANTS FACTORY $75,000
WESTMORELAND CO PA - MT PLEASANT TWP AT WESTMORELAND HOMESTEADS-GREENSBURG-MT PLEASANT RD
OWNER - WESTMORELAND GARMENT CORP WESTMORELAND HOMESTEADS PA (MAIL GREENSBURG) & C/O WASHINGTON MFG CO

DODGE REPORTS

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JAN 17 1938 — 2½-3 — PGH 1 #753 004 C 1ST REPT 11-16-37

OWNER TAKING BIDS ON GC DUE JAN 27TH AT 3 PM (EST)
BIDDERS ON GC
PANTS FACTORY $75,000
WESTMORELAND CO PA - MT PLEASANT TWP AT WESTMORELAND HOMESTEADS-GREENSBURG-MT PLEASANT RD
OWNER - WESTMORELAND GARMENT CORP WESTMORELAND HOMESTEADS PA (MAIL GREENSBURG) & C/O WASHINGTON MFG CO

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JAN 27 1938 — 2 — PGH 14 #753 004 H 1ST REPT 11-16-37

OWNER TAKING BIDS ON GC DUE FEB 2ND AT 3 PM (EST)
RESUME OF BIDDERS ON GC
PANTS FACTORY $75,000
WESTMORELAND CO PA - MT PLEASANT TWP AT WESTMORELAND HOMESTEADS-GREENSBURG-MT PLEASANT RD
OWNER - WESTMORELAND GARMENT CORP WESTMORELAND HOMESTEADS PA (MAIL GREENSBURG) C/O WASHINGTON MFG CO 5TH

DODGE REPORTS

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FEB 3 1938 — 4L — PGH 3 #753 004 I 1ST REPT 11-16-37

LOW BIDDERS ON GC - OWNER MAY AWARD CONTRACT IN ABOUT ONE WEEK
PANTS FACTORY $75,000
WESTMORELAND CO PA - MT PLEASANT TWP AT WESTMORELAND HOMESTEADS-GREENSBURG-MT PLEASANT RD
OWNER - WESTMORELAND GARMENT CORP WESTMORELAND HOMESTEADS

DODGE REPORTS

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FEB 9 1938 — 4 — PGH 1 #753 004 J 1ST REPT 11-16-37

GC AWARDED - PROBABLY START WORK SOON
PANTS FACTORY $75,000
WESTMORELAND CO PA - MT PLEASANT TWP OF WESTMORELAND HOMESTEADS-GREENSBURG-MT PLEASANT RD
OWNER - WESTMORELAND GARMENT CORP WESTMORELAND HOMESTEADS PA (MAIL GREENSBURG) C/O WASHINGTON MFG CO 5TH

DODGE REPORTS

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FEB 18 1938 — N — PGH 1 #753 004 K 1ST REPT 11-16-37

START EXCAVATING SOON - GC WILL AWARD EXCAVATION AT ONCE
PANTS FACTORY $75,000
WESTMORELAND CO PA - MT PLEASANT TWP AT WESTMORELAND HOMESTEADS-GREENSBURG-MT PLEASANT RD
OWNER - WESTMORELAND GARMENT CORP WESTMORELAND HOMESTEADS PA (MAIL GREENSBURG) C/O WASHINGTON MFG CO 5TH

DODGE REPORTS

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Home Owners' Catalogs
Sweets Catalog Files
Architectural Record
Real Estate Record
Building Statistics

MAY 26 1938 — 6-N — PGH 3 #753 004 O 1ST REPT 11-16-37

UNDER ROOF & ON BRICK WORK
PANTS FACTORY $75,000
WESTMORELAND CO PA - MT PLEASANT TWP AT WESTMORELAND HOMESTEADS-GREENSBURG-MT PLEASANT RD
OWNER - WESTMORELAND GARMENT CORP WESTMORELAND HOMESTEADS PA (MAIL GREENSBURG) C/O WASHINGTON MFG CO 5TH AVE NEW YORK CITY
ARCHT - ALFRED M MARKS GROGAN BLDG 541 WOOD ST PGH PA
BRICK-STEEL FRAME 1 STY 187X102 WITH WING 72X56
FOR OFFICE-WOOD FLR CONSTN & RF DECK
GC - BAKER & COOMBS 319 LEMAIN AVE MORGANTOWN W VA
*CARPT - GC DOES
FINISHED FLRS (MAPLE) - GC DOES

This is part of a series of DODGE REPORTS on one project. The eight REPORTS shown in this series high-light important stages in the life of the job. Each subscriber gets only those REPORTS which will be helpful to him in his selling efforts (see page 7).

SELECTIVITY

Just the news that can be used. Briefly, that is what the selective method of issuing DODGE REPORTS gives the subscribers. It selects, from the day's output of news, the items which each subscriber can use to guide his individual selling activities to his best advantage.

The pre-selection of DODGE REPORTS for subscribers saves time and money for everyone. From day to day the professional, technical, structural, manufacturing and distributing groups of the construction industry know when they need each other, through the selective features of DODGE REPORTS. It's easy for them to get together *at the proper times.*

DODGE REPORTS give all the important information on construction work of every type. On page 6, there is a typical series of REPORTS on one project. There is a similar series for every project.

Only a few subscribers can use all of the information which is issued in a complete series of REPORTS on a single job, from the time it is "contemplated" until it is "completed." Their sales opportunities are usually limited to only a part of the active life of a job. Before and after that it is not strategic or possible for them to sell their products or services. They are too early or too late.

The selective method of issuing DODGE REPORTS considers each of these individual requirements.

REPORTS are selected for subscribers according to:

1. Geographical location. This selection, made by counties, limits the REPORTS to the areas in which the individual subscribers sell.

2. Construction stage. In this selection, REPORTS are limited to those covering projects currently in the construction stages in which the subscribers can put forth their sales efforts to the best advantage.

3. Sub-contract information. In this selection, the news is limited to information about the sub-contracts in which each individual subscriber is interested. Bid taking and contract awards are reported.

4. Type of project. This selection of REPORTS picks the type of projects which might include the subscribers' products or services.

5. Valuation of project. Only the projects in the cost-classes to which the subscribers can sell their products and services are included in this section.

Each Dodge subscriber has a pigeon-hole in which his news is assembled by these issuing clerks.

The selective service permits the issuing of DODGE REPORTS for a single county, or any group of counties, in the 37 eastern states. Each day, a set can be divided, accordingly, into the subscribers' individual territories and mailed directly to the proper salesmen.

In that way they will get the news without any delay. Duplicate sets mailed to the home or branch offices will serve as sales control files.

A Selective Service Order Blank is reproduced below. The sections of the order blank are bracketed and numbered on the left-hand side to correspond with the numbers which precede the descriptions of the five points of selectivity.

SELECTIVE SERVICE ORDER BLANK

1. **Territory Subscribed for**_____ **Business**

2. **STATUS OF PROJECT IN WHICH WE ARE INTERESTED**

Stage
— 1. "CONTEMPLATED"—prior to selection of architect.
— 2. "ARCHITECT SELECTED," "PLANS IN PROGRESS" and later stages to and including "TAKING BIDS."
— 3. "LIST OF GENERAL CONTRACT BIDDERS."
— 4. "GENERAL CONTRACT AWARDED."
— 5. (Only on projects built by separate contracts.) "WORK STARTED."
— 6. "ROOFING" and later stages to completion.

☐ Send only coded reports bearing the following symbols _____ 1—2—2½—3—4 & 4L—5—6—O—O—A—Z—N

3. **SUB CONTRACTS IN WHICH WE ARE INTERESTED** (Encircle code symbols desired)

1—Excavating
2—Foundations and Piling and Caissons
3—Mason (brick, stone and concrete)
4—Fireproofing
5—Carpenter
6—Cut Stone
7—Structural Steel
8—Ornamental Iron and Bronze
9—Plumbing
10—Heating and Ventilating
11—Electric
12—Elevators
13—Roofing
14—Sheet Metal
15—Plastering
16—Painting
17—Glazing
18—Marble and Tile
19—Floors (Finished)
20—Mill Work
21—Metal Trim, Hollow Metal and Kalamein
22—Bank and Store Fixtures
23—Interior Decorating
58—Sprinklers

4. 5. **PROJECT TYPES AND VALUATIONS IN WHICH WE ARE INTERESTED**

Max. Value / Min. Value

Commercial Buildings
— — 1—Bank Buildings
— — 2—Garages—Service Stations—Hangars
— — 3—Loft Buildings and Warehouses
— — 4—Office Buildings
— — 5—Restaurants
— — 6—Stores and Markets

Educational Buildings
— — 7—Educational Buildings—Parochial Schools
— — 8—Libraries and Museums
— — 9—Public Schools

Hospitals and Institutions
— — 10—Hospitals and Institutions

Industrial Buildings
— — 11—Manufacturing Buildings
— — 12—Power Plants and Transmission Lines
— — 13—Refrigerating Plants

Public Buildings
— — 14—Armories—Auditoriums—Rinks—Stadiums
— — 15—Capitols—Court Houses—Post Offices
— — 16—Monuments and Mausoleums
— — 17—Municipal Buildings—Jails
— — 18—Railroad Stations—Car Barns—Freight Houses

Religious Buildings
— — 19—Churches and Chapels—Funeral Parlors
— — 20—Convents—Monasteries

☐ Check here if projects built by separate contracts are not wanted.
☐ Check here if "Out of Town" news is desired.

Residential Buildings
— — 21—Apartments
— — 22—Apartments and Stores
— — 23—Hotels
— — 24—Residences (Owner Occupy)
— — 25—Residence (For Sale)
— — 26—Residences (five or more)

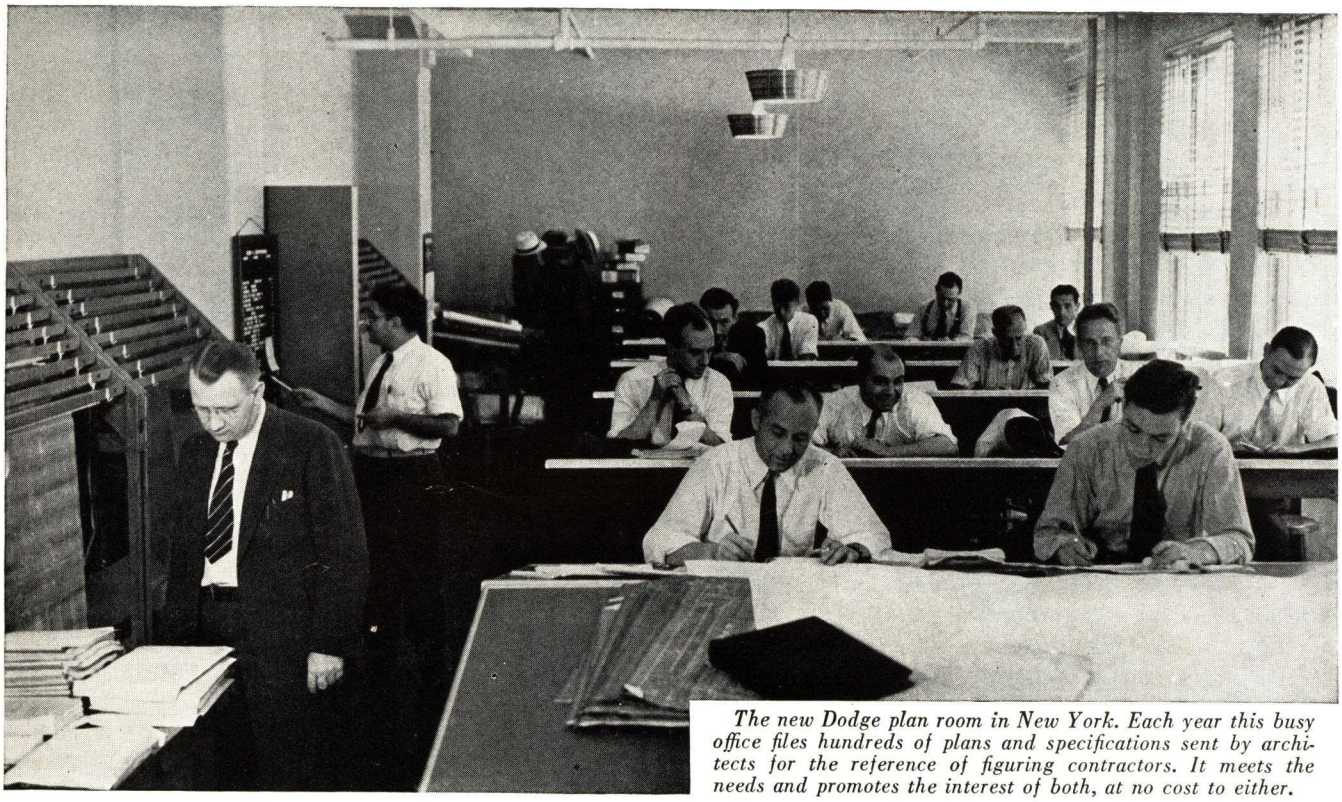
Social and Recreational Buildings
— — 27—Clubs—Lodges—Parish Houses—Gymnasiums
— — 28—Park Buildings
— — 29—Theatres

Miscellaneous Buildings
— — 30—Greenhouses
— — 31—Stables and Farm Buildings

Public Work and Utilities
— — 32—Airports
— — 33—Bridges
— — 34—Dams—Reservoirs—Retaining Walls—Dredging
— — 35—Docks and Piers
— — 36—Parks—Golf Courses—Playgrounds—Swimming Pools
— — 37—Railroads—Subways—Tunnels
— — 38—Gas Plants—Electric Lighting Systems
— — 39—Sewers—Gas and Water and Oil Mains—Drainage Ditches
— — 40—Streets and Highways
— — 41—Water Supply and Sewage Disposal Plants

☐ Check here if "In Abeyance and Abandoned" reports are desired.
☐ Check here if "Announcements of Plans on File" are not wanted.

DODGE PLAN ROOM SERVICE



The new Dodge plan room in New York. Each year this busy office files hundreds of plans and specifications sent by architects for the reference of figuring contractors. It meets the needs and promotes the interest of both, at no cost to either.

The Dodge Plan Rooms are another service to architects. All architects are cordially invited to use them, without cost or any other obligation. Plans and specifications which are available at Dodge offices during the estimating periods of the jobs offer a convenience to the figuring contractors as well as the architects.

How to File Plans and Specifications in Dodge Plan Rooms

Plans and specifications may be sent to Dodge by express, collect, or a messenger will be sent for them. They will be announced in Dodge News as soon as they are filed. All contractors who are interested in the jobs will find them readily available for estimating purposes. After contracts have been awarded, the plans and specifications will be returned to the architects' offices or forwarded to the successful bidders, as desired. Plans and specifications will receive good care while they are in a Plan Room.

The advantages of Dodge Plan Rooms to architects are summarized in eight points:

1. No bother. Fewer material men and sub-contractors will call at architects' offices to figure on jobs. Those who call can be referred to the Dodge Plan Room to avoid congestion in architects' offices. This is particularly valuable when more than one job is being figured at a time.

2. Distant jobs simplified. When jobs are in distant cities, plans filed in the nearest Dodge Plan Room will simplify bid-taking from sub-contractors in those cities.

3. No general contractors. We do not permit general contractors to use the plans and specifications in our Plan Rooms, except at the request of the architects concerned.

4. We do not interpret plans and specifications. At no time do we interpret the plans and specifications for an estimator or anyone else.

5. Open to all. The Dodge Plan Rooms are open to the estimators of any reliable firm without charge or any other obligation. This service is not limited to Dodge subscribers.

6. Dodge will call for plans and specifications. Plans and specifications may be sent to us by express, *collect*, or we will send a messenger for them.

7. Plans are returned to architects, or sent to successful bidders. When the contracts are awarded, we will return the plans and specifications at our expense to the architects, or forward them to the contractors, as desired.

8. Mutilation of plans not allowed. We emphasize that users of the plans are not permitted to cut or mark them. We try to return them in the good condition in which they are received.

Hundreds of architects are ordering one or more sets of plans and specifications for Dodge Plan Rooms, as a standard practice. Several comments on this service are included on page 5. Any Dodge reporter will be able to discuss this service fully.

DODGE SPECIAL INQUIRY SERVICE

The Special Inquiry Service is a supplement to DODGE REPORTS which is highly valued by architects, engineers, and all Dodge subscribers. In the course of a year, 28 Dodge Special Inquiry offices, centrally located throughout the 37 eastern states, answer hundreds of thousands of questions. Typical of the questions from architects and engineers are the following:

"What types of work are most active now?"

"What jobs do you know of on which the architect has not been selected?"

"Which Kansas City contractors have handled large building projects?"

"Who handles the products of the A.B.C. Manufacturing Company here in town?"

"Who are the members of the building committee for the Main Street Baptist Church, and what are their addresses?"

"What kind of marble was used in the First National Bank?"

Other questions answered by the Dodge Special Inquiry offices are typified by:

"Who are the bidders on the Barnes job and when are the bids due. Where and when will the bids be opened?"

"On the Thompson job, who is the low bidder," *or*, "who received the general contract?"

"Who has been awarded the plumbing in the Smith residence?"

"I hear there is a big hospital job in Minneapolis. I don't know the name of it. What can you tell me about it?"

"I am looking for a contractor named Doakes. Can you tell me where he is located?"

"Can you tell me who was the architect on the Broadway Building (*completed about five years ago*)?"

Right, *the telephone desk of the Dodge Special Inquiry Department in New York. Many tens of thousands of questions are answered each year over these telephones with timely and accurate information about building and construction projects.*

DODGE REPORTS

This report consists of confidential information gathered, prepared and owned exclusively by F. W. Dodge Corporation. Its use in a particular manner is granted by contract. Any other use will be prosecuted.

F.W. DODGE CORPORATION

Home Owners' Catalogs
Sweets Catalog Files
Architectural Record
Real Estate Record
Building Statistics

"HOME OWNERS' CATALOGS" VOL B WAS SENT THIS OWNER TODAY

AUG 22 1938- I NY 9 #244 257

CONTEMPLATED - OWNER WILL SELECT ARCHT & PROJECT WILL ADVANCE IN SPRING OF 1939
RESIDENCE (00)
NEW ROCHELLE NY (WESTCHESTER CO) OXFORD RD
OWNER - DR F DUNCAN BARNES (RES) 50 ELIZABETH RD NEW ROCHELLE NY (NEW ROCHELLE 9050) (BUS) 421 HUGUENOT ST NEW ROCHELLE NY (NEW ROCHELLE 1141)
ARCHT - NOT SELECTED
FRAME 2½ STYS & BASE
PROB INCL 8 RMS-3 BATHS & GARAGE ATTACHED

This typical report, reproduced in actual size, indicates clearly the early stages in which Dodge news coverage begin.

The legend at the top of the REPORT shows clients of Home Owners' Catalogs *that their descriptive and illustrated catalogs have been placed before prospective home owners.* Home Owners' Catalogs *is described on pages 12 and 13.*

DODGE STATISTICAL RESEARCH SERVICE

DODGE STATISTICS—"WHY" AND "HOW" COMPILED

Constant change characterizes the construction market. Educational building may be most active at one time, highways the next; then, perhaps, industrial buildings or small homes. One month, quarter, or year, it is the New York area that is forging ahead, and maybe the next period it is Texas.

Government spending, industrial prosperity, droughts, frozen mortgages, low interest and liberal loans, industrial unrest, seasonal trends — all these forces mould the country's construction program.

The composite effect of all these factors is recorded by Dodge Statistics, which are based upon Dodge Reports. These reports contain construction information gathered from all available sources (architects, engineers, contractors, development companies, real estate operators, public officials, banks, owners, etc.). The reports are mailed daily from Dodge Reports issuing offices to the Statistical and Research Division in New York and constitute, in fact, a daily census of construction.

BULLETIN SERVICE

The broad current statistical needs of the factors interested in the construction market are served, on a subscription basis, through *Dodge Statistical Research Service* in the following manner:

a. Monthly bulletins showing fundamental data of new building and engineering contracts awarded east of the Rocky Mountain (37 states), giving number of projects, number of buildings, new floor space in square feet, total value, and new family dwellings provided.

b. Monthly bulletins showing contracts awarded, classified according to 48 separate and distinct types, based upon the use for which the project is intended. These 48 types are also grouped into 11 general classes.

c. Monthly bulletins showing complete building and engineering statistics — both new construction and new projects contemplated for each of 15 major trading areas applicable to the building field in the 37 Eastern States.

d. Monthly bulletins showing the following for 80 Metropolitan areas: Total construction—Residential building, Non-residential building. Figures are given for the latest month and cumulative for year and for corresponding period previous year.

e. Tri-monthly bulletins give intermediate summary building data, by 15 major trading areas.

SPECIAL SERVICES

Dodge Statistics are being prepared, on special contract, by *Counties* and by *Clients' Sales Territories*. Each contract is "tailored" to client's requirements from our base data—Dodge Reports, and therefore is available in detail comparable to the regular bulletin service.

Dodge Statistics are also sub-divided into "Architect-Planned" and "Planned by Others" which data are published at various times and can be followed currently, if so desired. Another segregation of data records the volume of construction which is publicly owned as distinguished from that which is privately owned. These data are also published and available on a subscription basis.

Special studies of particular interest to factors in the construction industry are made and covered in report form from time to time.

USES

Dodge Statistical Research Bulletins or Special Services are indispensable to those active in any phase of the construction industry.

These services are usable in the following specific manners:

1. To furnish bankers, material supply interests, marketing executives, public officials, and all other factors in the construction industry with an accurate and current picture of trends within the industry.
2. To assist in the forecasting of sales and the allocation of quotas by geographical areas, the apportionment of advertising and selling expense in relation to sales potential and the checking of sales performance.
3. To make market and economic studies.
4. To guide the editorial and circulation plans of the *Architectural Record.*
5. To guide the distribution of *Sweet's Catalog* Files.
6. To inform architects of economic trends in the industry that are vital to them.
7. To inform the general public and all factors in the construction industry as to the relative importance of architects in construction enterprises.

BENEFITS

Dodge Statistics measure the movements in the building industry and through the interpretation of these data, certain functions, outlined in the preceding paragraph, are more efficiently performed.

This improvement in efficiency is extremely significant because it accrues equally to the direct benefit of architect, manufacturer, contractor, trade mechanic, etc., by tending to lower the cost of the product (Buildings) produced and thereby stimulate an increase in that volume. This decrease in distribution costs is of very great importance at this time in offsetting the rising material prices and labor rates.

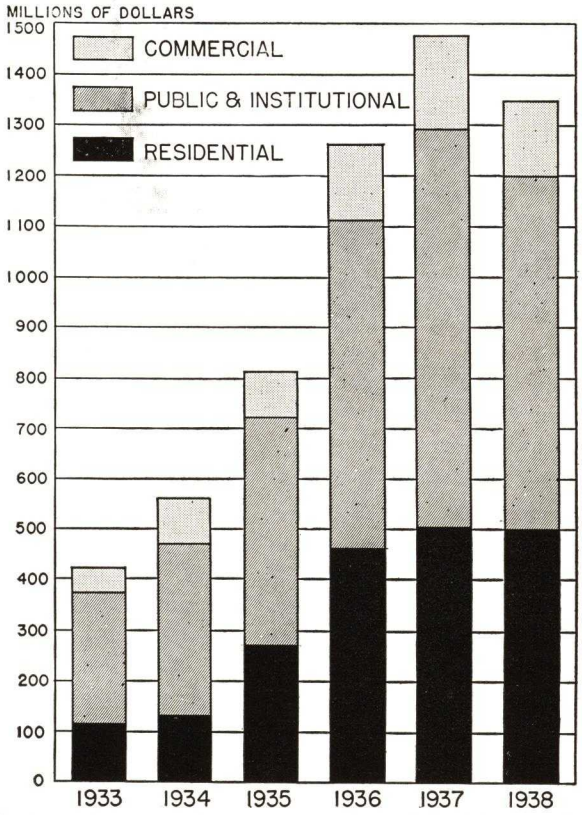
Urge everyone you know in the building field to investigate the Dodge Statistical Research Service for their mutual benefit.

ARCHITECT-ENGINEER PLANNED BUILDING

Since 1933, architect-planned building has experienced a far greater recovery than building constructed without architectural services. While total construction increased 140 per cent from 1933 to 1938, the volume of architect-planned building rose more than 200 per cent.

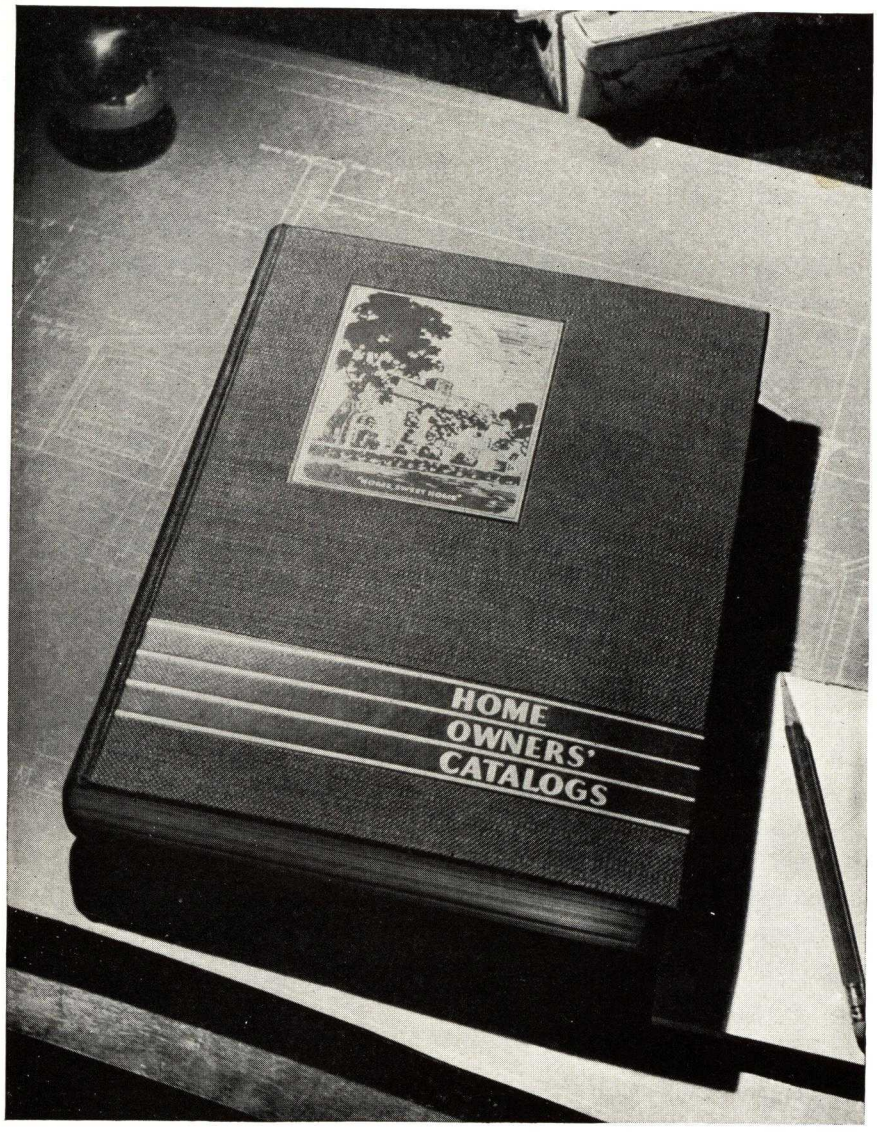
In the accompanying chart the volume of architect-planned work is shown for the 37 Eastern States beginning with 1933. The effort of the federal government to stimulate business in the early phases of the recovery period resulted in a more rapid expansion of public building. Since 1935, however, residential building again became the most important class requiring architectural services.

The indicated totals for 1938 are based upon the record covering the first eight months. Of the $1,350,000,000 shown for the full year 1937, approximately $315,000,000 was for architect-planned dwellings, $185,000,000 for apartments and hotels, $130,000,000 for industrial buildings, $230,000,000 for educational buildings, $150,000,000 for commercial buildings, $90,000,000 for public buildings, $90,000,000 for hospitals and institutions, $100,000,000 for social and recreational buildings, $40,000,000 for religious and memorial buildings, and $20,000,000 for miscellaneous non-residential buildings.



Dollar value of architect-engineer-planned building in the 37 Eastern States by major classes. Totals for the year 1938 estimated on the basis of the record for the first eight months.

HOME OWNERS' CATALOGS



HOME OWNERS' CATALOGS is a cloth-bound book which assembles descriptive and color illustrated information about the home building materials, equipment, furnishings and services of prominent firms in the building industry. This information is prepared with the layman's understanding foremost in mind.

Three important factors in home building: owner, architect, and manufacturer, are served by HOME OWNERS' CATALOGS, with equal effectiveness. The prospective home building family gets an abundance of information in HOME OWNERS' CATALOGS on subjects about which they most often know nothing, or at best, very little. Thereby, they are induced to think of their own requirements in a practical way and can transmit their ideas more graphically to facilitate the preparation of final plans and details. The architect naturally benefits from the improved ability of his client to give him understandable ideas which he then can incorporate in his plans for a house with the required long-life, comfort, convenience, beauty and economy. Conference time and troublesome changes will be reduced materially. HOME OWNERS' CATALOGS urges all home building families to take advantage of the economies of architectural assistance when they are about to plan their own homes* . . . The firms whose products and services are utilized in home building call upon HOME OWNERS' CATALOGS to place their descriptive and illustrated information before the prospective owners in a form which will encourage careful and repeated study of the individual adaptability of their products and services.

HOME OWNERS' CATALOGS is another Dodge publication which helps lower manufacturers' sales and distribution costs, with consequent advantages to architects. Following are some of the important features of HOME OWNERS' CATALOGS.

1. Only prospective home owners, who have been identified by DODGE REPORTS, receive HOME OWNERS' CATALOGS. They will spend at least $4,000 (exclusive of land) for their homes, in the twelve months after they receive their book. The book is sent when the owner is planning his new home—the time it will do the most good. It is not sent to an owner after work has been started.

2. To eliminate a waste of costly literature, HOME OWNERS' CATALOGS is distributed in thirteen separate editions, each limited to a particular trading area. In this way,

*"Building a home is more than a romantic experience. Intensely practical aspects are involved, and the satisfaction you derive over the years will depend largely upon the success with which you meet the practical phases of house construction. Of these no others are so important as Design and Plan. Design and Plan must be adjusted to your desires, your needs and your budget. The architecturally trained man is better able to handle this phase of home building operation than anyone else." . . . *Foreword,* HOME OWNERS' CATALOGS.

*"To adjust individual ideas to the complete plan, and things to budget, is often a difficult task. It is here that the sympathetic, architecturally trained man renders vital service. Again, architectural supervision of the home during construction is a safeguard. Architectural service from first to last is true economy." — *Letter, accompanying* HOME OWNERS' CATALOGS.

firms can control their catalog-distribution within their own selling areas.

3. A client has plenty of space to tell his most informative and illustrated story. He can use any number of four-page units.

4. HOME OWNERS' CATALOGS arrives while the owner is in the planning stage. It furnishes the information with which he can make basic decisions.

5. Copies of the book will be kept by the owners and referred to while the homes are being planned and built. In most cases it is retained long after the house has been finished. At all times it will be an inspiration to other families to build their own homes.

Many architects make it a standard practice to request copies of HOME OWNERS' CATALOGS for their home building clients. The books will be sent with the compliments of the architects, if requested.

All architects are cordially invited to request that copies of the book be sent to their clients who are planning to build homes for their own occupancy. The earlier they get their books, the better they will be able to transmit ideas of their requirements to their architects.

TYPICAL COMMENTS ON HOME OWNERS' CATALOGS FROM ARCHITECTS

"Instead of taking two months to produce plans, details and specifications, it took me just one month—a saving of valuable time with no headache, simplifying signing of contracts and making supervision easy for the Architect and bringing pleasure to the owner in completing his or her own home. . . . Many more observations on the subject could be made—but it all comes to one result—that besides your own and your staff's efforts in promoting helpful information, your courtesy and assiduity are continually making it seem easier and happier for the professional Architect's office—and I am one who thanks you."—Louis de Ladurantaye, Architect, Washington, D. C.

"I have found the Home Owners' Catalog the most desirable way for the manufacturer to bring his product to the attention of the Owner, from the point of view of all interested parties; that is the manufacturer, the owner, and the architect."—Lawrence M. Loeb, Architect, White Plains, N. Y.

STOCK PLANS PROHIBITED

Editorial approval of the contents of each client's catalog must be obtained from F. W. Dodge Corporation before it can be inserted in HOME OWNERS' CATALOGS. Catalogs featuring, or recommending, stock plans are not acceptable.

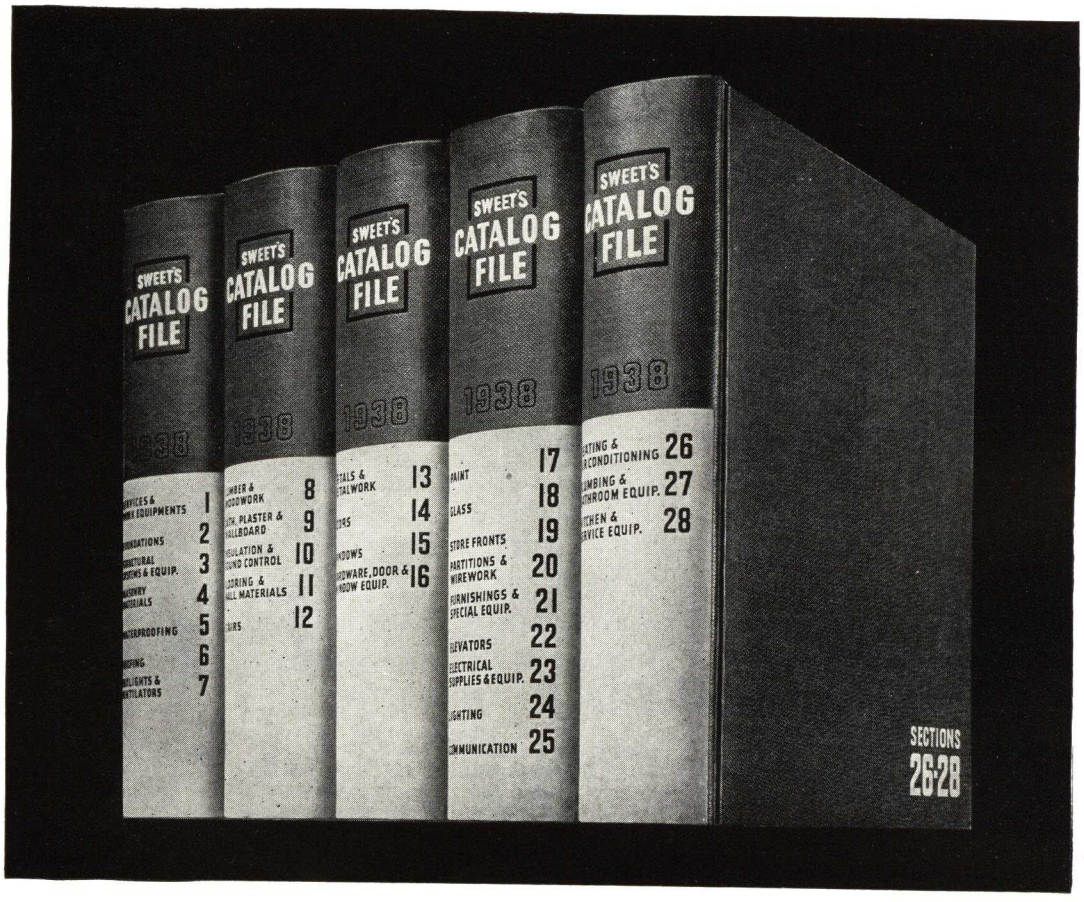
DISTRIBUTION OF HOME OWNERS' CATALOGS

A copy of HOME OWNERS' CATALOGS is available for every family who is planning to build a home of their own, in the 37 eastern states, within the twelve succeeding months, at a building cost of $4,000 or more, exclusive of land purchase. It is delivered postage-paid to those families, without cost or any other obligation.

THESE PROMINENT FIRMS
IN THE
BUILDING INDUSTRY
Describe and Illustrate Their Products and Services in Various Editions of
HOME OWNERS' CATALOGS

American Brass Company
American Lumber & Treating Company
American Radiator Company
Andersen Corporation
Armstrong Cork Company
Bartlett Tree Expert Company, F. A.
Burnham Boiler Corporation
Carey Company, The Philip
Chambers Distributing Company, Inc.
Chase Brass & Copper Company
Clay Equipment Corporation
Cox Kitchens, Inc.
Columbia Metal Box Company
Crane Company
Curtis Companies Inc.
Davey Tree Expert Company, The
Delco-Frigidaire Conditioning, Div. General Motors Sales Corporation
Detroit Steel Products Company
Donley Brothers Company, The
Douglas Fir Plywood Association
Excel Metal Cabinet Company, Inc.
Fitzgibbons Boiler Company, Inc.
Florida Louisiana Red Cypress Company
Fox Furnace Company, The
Gar Wood Industries, Inc.
Illinois Brick Company
International Heater Company
Janes & Kirkland, Inc.
Kerner Incinerator Company
Libby-Owens-Ford Glass Company
Littlefield-Wyman Nurseries
Lucke, William B., Inc.
Majestic Company, The
Masonite Corporation
Minneapolis-Honeywell Regulator Company
Modern Steel Equipment Company
Northern Hemlock & Hardwood Manufacturers Association
Overhead Door Company, Inc.
Peoples Outfitting Company
Perfection Stove Company
Pittsburg Water Heater Corporation
Rolscreen Company
Sheffield Brick & Tile Company
Sisalkraft Company, The
Sloane, W. & J.
Stanley Works, The
Streamline Pipe & Fittings, Div. Mueller Brass Company
Tile-Tex Company, The
Tracy Manufacturing Company
Truscon Steel Company
Waterman-Waterbury Company
Wayne Iron Works
Weil-McLain Company
Weis Mfg. Company, Inc., Henry
Western Pine Association
Wyman's Framingham Nurseries, Inc.

SWEET'S CATALOG SERVICE

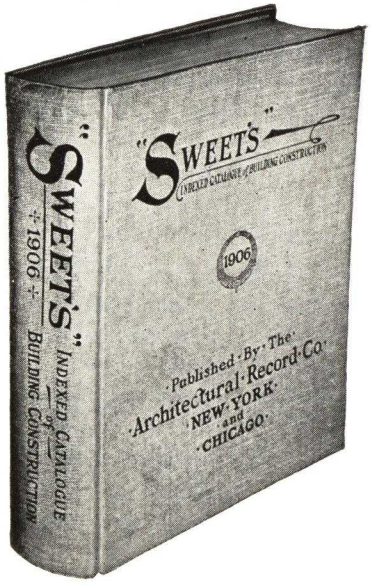


SWEET'S CATALOG FILE

This file, originated, produced, and distributed by Sweet's Catalog Service, is a collection of manufacturers' catalogs, especially designed to meet the requirements of architects, engineers, and contractors. The catalogs therein have been indexed, classified, and *prefiled*—i.e., filed in Sweet's before distribution to users' offices. Prefiling eliminates the waste of time, money, and effort attending the *individual* distribution of manufacturers' catalogs. By means of this procedure, it is possible to review, revise, and bring up to date every catalog and catalog page in the file, assuring the user as no other filing method could, that the latest information has been added and the obsolete information eliminated.

The current (1939) file which you now have before you, represents a stage in the development of a plan which has been widely accepted by leading architects, engineers, contractors and manufacturers as the most practical, economical and effective method of meeting the catalog needs of these mutually dependent groups.

Since the first appearance of Sweet's in 1906, great progress has been made, but much remains to be done. It is the purpose of this outline to clarify some points which seem not to have been well understood by those who, in their enthusiasm for the Sweet's file *as it is today*, have not fully considered the benefits which lie in its continued development.



SWEET'S FOR 1906 —*The first of an unbroken series of thirty-two Sweet's Catalog Files, issued each year regardless of panics, wars and depressions. Mergers and liquidations have removed the names of many manufacturers from the original roster of 428. Yet eighty of these pioneers are still carrying on in Sweet's and nearly a thousand additional concerns have joined them.*

CATALOG FILES — OLD STYLE AND NEW

No architect or contractor needs to be reminded of the time, effort and expense required to maintain even a semblance of a workable file in the days before there was any alternative to building one up, piece by piece, from the catalogs supplied at irregular intervals by the manufacturers. The sorting, classifying, filing, refiling and replacement of individually distributed catalogs necessitated a time-consuming routine which few had the facilities or inclination to follow. The result was highly unsatisfactory both to architects and to manufacturers.

It was hardly surprising that building professionals welcomed the inauguration of a new method of catalog distribution which would give them, instead of the raw materials for a file, a complete file in itself. In spite of its modest beginning, the plan was received with universal favor. At once, it became the custom to "look it up" first in Sweet's — and to resort to the old file only when forced to do so. In the following years, the Sweet's file grew to such proportions that many found it unnecessary to maintain any other, especially in view of the marked trend toward the distribution of more comprehensive and useful catalogs in Sweet's.

CATALOG ECONOMICS

The splendid support of the building profession has been one of the important contributing factors in the successful development of Sweet's. Many users of this file take every opportunity to recommend to manufacturers that they file their catalogs in Sweet's. Some, with commendable conscientiousness, add the qualification, "provided the cost is not prohibitive," their impression being that the Sweet's plan involves great added expense to those on the selling end. This is far from the fact.

Sweet's clients pay on the average only one cent per page per year to send you their catalogs in the Sweet's file. This charge includes printing, filing and delivery to your office and in many cases, preparation of the catalog by Sweet's staff of consulting architects. It is the cost of *individual* catalog distribution which is prohibitive. Only a pitifully small percentage of separate catalogs find their way into a file—so few that a catalog costing 25 cents to print and deliver, on the average, actually costs $1.25 per copy filed.

A manufacturer can place a 24-page catalog in 14,500 offices of architects, engineers and general contractors, via the Sweet's file, at less than 22 cents apiece. Even if he were able to prepare, print and distribute individual copies of the same catalog to the same offices for 18 cents apiece, the net result would be a "saving" of $580. And for this "economy," he would consign 80 per cent of his catalogs to the scrap heap.

Even in the case of the manufacturer who distributes a catalog of only one or two pages, Sweet's can handle the job at less than the cost of mailing alone!

Bulk buying of paper, bulk printing and bulk distribution permit economies which are shared by all clients of Sweet's service. The small portion of the charge which is applied to the service features of Sweet's is not comparable with anything in existence at the present time. Manufacturers cannot assure the maintenance of their catalogs in recipients' offices, in equally convenient and accessible form, in any other way, *at any price.*

WHEN THE MANUFACTURER ASKS YOU ABOUT CATALOGS

In spite of ample precedent and convincing evidence there are still some manufacturers to whom the idea of distributing a catalog as an integral part of the Sweet's file appears somewhat radical. Aside from the very human tendency to resist change, there is often an honest doubt in their minds that a catalog filed in Sweet's can make for more satisfactory and profitable business relations than if distributed individually. They find it difficult to believe that the catalogs which they have prepared with such care and thoroughness (when that is actually the case) will fail to be rewarded by recipients' interested attention and continued use. Even though they admit the existence of a catalog filing problem in the latter's offices, with its attendant wastes, each believes that *his* catalog is the exception to the rule, and that it will be singled out for preservation and use.

Every so often, one of the less reactionary spirits decides to check up on the situation. The usual procedure is to conduct a questionnaire investigation. Some of these are well designed to elicit the desired information; but others are so lacking in this quality that a busy man might unwittingly convey a wrong impression in his reply.

For instance, a manufacturer with a four-page condensation of his catalog in Sweet's might send you a separate copy of a catalog well designed to meet your needs with the ambiguous question:

"Would you prefer that we send you our catalog individually, or shall we confine our efforts to Sweet's?"

Of course you want the most useful information you can get and you tell him so. But unless you make it plain that you prefer to have it sent to you filed in Sweet's he will assume your preference to be for a separate catalog. He should have stated his case somewhat as follows:

"We are planning the distribution of a new catalog. Would you prefer to receive a loose copy or shall we send it to you in the Sweet's file?"

Then there would be no misunderstanding of the question or of the answer.

Another example of this ambiguity is found in the question:

"Is it your habit to consult the Sweet's file for catalog information on ———?"

Now it may happen that the manufacturer in this case issues an unusually valuable catalog which is retained by more than the average number of offices, not because the separate catalog is preferred, but because the information is not as well presented in the Sweet's file. Under these circumstances, your answer might be misleading —unless you take the trouble to explain that it is your habit to consult the Sweet's file first as a source of catalog information; that in this instance you have been forced to go elsewhere to supplement the information, and that you would prefer to have what you want in Sweet's

The new user of Sweet's may wonder at our apparent presumption in assuming that replies will be generally favorable to Sweet's. We can only say that the question has been put to the profession in scores of surveys and Sweet's always has been voted the best solution of the catalog problem.

THE CURRENT TREND

The ultimate aim of Sweet's is to furnish you each year with a file of catalogs in which you can find useful, up-to-date information on the products of every reputable manufacturer.

A measure of the progress toward this goal is found in the yearly increase in the number of well-designed catalogs. It should be remarked at this point that the number of pages does not, in every case, indicate the usefulness of information, or lack of it. In addition to the many catalogs in Sweet's whose bulk alone marks them for attention, there are scores of adequate catalogs which do not include more than a few pages. These are just as valuable and useful in connection with the products they describe as the catalogs in which an effective presentation necessitates the use of eighty or a hundred pages.

The important point is that increasing numbers of Sweet's clients are coming to recognize your information requirements and are calling on Sweet's staff of consulting architects to assist them in the preparation of catalogs which shall be adequate to meet them.

Many requested that their catalogs, so prepared, be filed in their own individual covers. Sweet's made covers optional on catalogs of twelve pages or more. 62.2 per cent of all the information in the current Sweet's Catalog File is presented in the form of cover catalogs. In 1928, there was only one such catalog in Sweet's. In the following year there were nine. Today there are 189!

It is also significant that nearly all the ground gained has been retained. In other words, when a manufacturer has learned to take full advantage of Sweet's service, he continues to use it year after year. The few who drop out do so, almost invariably, for reasons which do not concern the quality of the service rendered.

Of 191 manufacturers who filed the largest catalogs in the current Sweet's 54 have distributed their catalogs in this form for twenty-five years or more; 137 for ten years or more; and 169 for five years or more.

BEHIND THE SCENES

Many architects, writing to acknowledge receipt of a new Sweet's, have commented on the thousands of changes and revisions necessary to bring the hundreds of manufacturers' catalogs up to date each year.

The distribution of a complete Sweet's file is the culmination of twelve months of catalog service rendered continuously to hundreds of manufacturers. Throughout the year, Sweet's is busy preparing the material for clients' catalogs and, whenever new catalogs are needed immediately, printing and distributing advance copies which later will be filed and distributed in the complete new file.

Here is the procedure:

PRELIMINARY—Fourteen district managers and their assistants, working out of offices strategically placed from coast to coast, make preliminary arrangements with manufacturers, receive their orders and transmit their detailed instructions to the proper departments in the New York or Chicago offices.

CATALOG PREPARATION — ARCHITECTURAL AND ENGINEERING CONSULTANTS—In order that catalogs in Sweet's may contain information of real usefulness to you, the services of a staff of consulting architects and engineers are placed at the manufacturer's disposal without charge. All members of this staff are men of practical experience and most of them have previously conducted successful private practices. They have compiled scores of the most comprehensive and useful catalogs in Sweet's.

COPY SERVICE—Sweet's maintains, in addition, an experienced copy staff, which operates under instructions from the consulting staff or direct from the manufacturers.

EDITORIAL SERVICE — Catalogs are reviewed and edited from the user's point of view to check any facts, figures, statements or illustrations which might not be understood or might mislead and suggestions for changes are forwarded to manufacturers for approval and incorporation before printing.

CLASSIFYING AND INDEXING—This work proceeds concurrently with the receipt of okayed proofs. Catalogs are first classified into sections according to products cataloged and then alphabetically as far as possible by manufacturers' names within each of these sections. These important operations, which require up-to-date and extensive knowledge of all products and expert supervision, contribute greatly to the usefulness of the Sweet's file.

PRINTING AND BINDING—After copy in proof form has been approved by manufacturers it is printed, as fast as forms can be assembled, in one of the largest and best equipped plants in the country. 20 carloads of paper were required for the current file. Finally 80,000 separate volumes of catalogs (five to a file) are permanently bound to withstand the constant handling they receive and to insure each manufacturer's catalog against loss in recipients' offices.

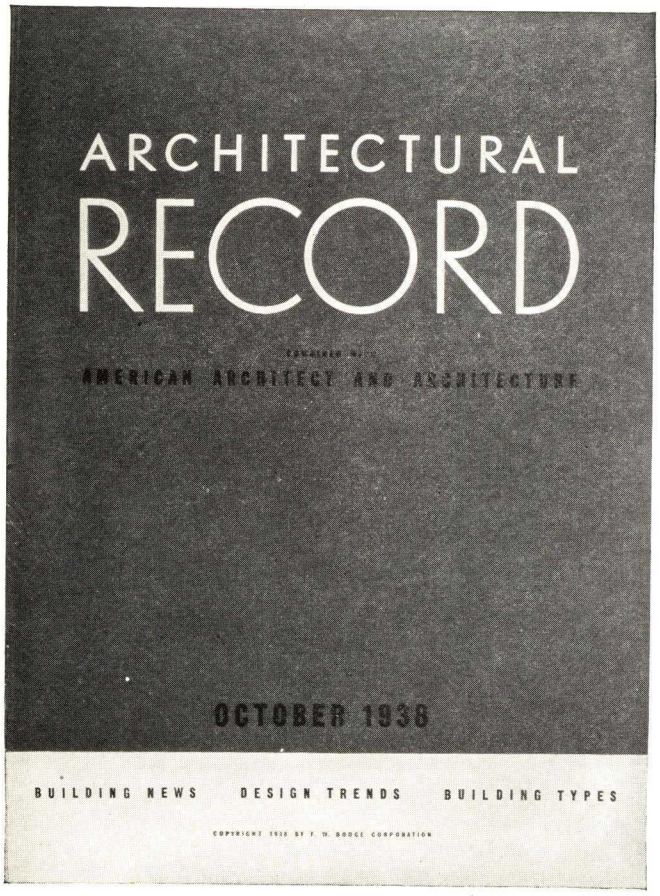
DISTRIBUTION—Now comes the work of getting upwards of 400 tons of manufacturers' catalogs to their proper destinations, in order that they will be accessible in 14,500 offices of architects, engineers and general contractors. The lists have been kept up-to-date throughout the year through Dodge Reports and other authentic records. Shipping cartons, labels and receipts are ready. For a solid month thousands of sets of Sweet's move by freight, express, parcel post and motor truck—and a new, up-to-date file has reported for duty, to carry on the work of its predecessor. Throughout the year, as important new firms are reported by the 750 reporters and correspondents of F. W. Dodge Corporation, of which Sweet's Catalog Service is a division, these firms are provided with the Sweet's file.

Western Union Messengers delivering the 1938 Sweet's Catalog Files to the offices of architects, engineers, and contractors. This photo could have been taken in any city in the United States.

The cycle is endless. As soon as the new Sweet's file is delivered to your office, work commences on the next. Hundreds of people participate directly or indirectly in its compilation and distribution. In addition to those employed by Sweet's clients, by paper producers, engravers, printers and distributing agents, eighty individuals on the Sweet's staff are employed the year 'round to provide you with this service.

1/4

ARCHITECTURAL RECORD



ARCHITECTURAL RECORD is a professional publication for building designers — a valuable working tool of architects, engineers, and others who develop plans and specifications to fulfill the requirements of individual owners and users of buildings.

Although second to none in number and quality of its photographic illustrations, ARCHITECTURAL RECORD is valued among building designers for its complete and accurate detail . . . in the form of skillfully prepared isometric drawings, floor plans, "close-ups" of unusual structural innovations, mechanical drawings and other architectural and engineering data.

Since these men require a constant flow of *organized* information, ARCHITECTURAL RECORD logically presents its material in three separate and distinct sections.

GROWTH

ARCHITECTURAL RECORD was established in 1891 and has been published by the same organization since the issuance of Vol. 1, No. 1. Effective with the March 1938 issue, it absorbed the monthly publication, American Architect and Architecture, and retained the two best-liked editorial features (Time-Saver Standards and Portfolio of Design Details) of that magazine. Although it has changed with the requirements of the times, its prime function remains the same as it was forty-six years ago. Edited now, as then, exclusively for building designers, its purpose is to serve the needs of building designers — by whatever titles they are known — and to serve them well.

EDITORIAL PERSONNEL

Editorial Director: Thomas S. Holden, vice-president in charge of Statistics and Research, F. W. Dodge Corporation, B.A. and M.A., University of Texas; B.S. in architecture, Massachusetts Institute of Technology. President, New York Building Congress, Inc.; vice-chairman, Committee for Economic and Social Progress, Inc. (formerly, Committee for Economic Recovery, Inc.); chairman, special committee on housing, Merchants' Association of New York. Member, Engineers' Club of N. Y.

Managing Editor: O. C. Anderson, Newspaper and business paper writer. Formerly: managing editor, Swetland Publications, Inc.; publication director, The Young Business Man; editor, Pacific International Exporter; and editor, Building Business and Inter-Industry Selling, publications of Sweet's Catalog Service division of F. W. Dodge Corporation.

Editors: James M. Fitch, Jr. Educated at Alabama and Tulane. Architect in private practice four years. Director of Population Statistics of Tennessee State Planning Commission; F.H.A., Low Cost Housing Division.

Roger Wade Sherman. Studied at University of Michigan, Harvard and University of Pennsylvania. Architectural practice for 10 years. Formerly: Managing editor and technical editor, American Architect and Architecture; Managing editor of Architectural Forum. Consultant, U. S. Housing Authority. Member, Architectural League of New York.

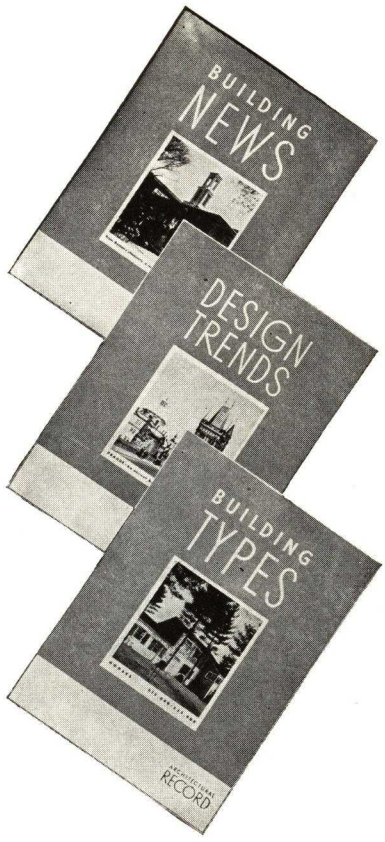
Associate Editors: Elizabeth Kendall. Educated Institucion Libre de Ensenanza, Madrid, Spain; B.A. Tulane University; M.A. University of Wisconsin; studied architecture at Tulane University and University of California. Reporter, New Orleans Times-Picayune for two years.

Irvin Kuper. Educated at New York University, Harvard Graduate School of Architecture.

Frank G. Lopez, Jr. Studied at Cornell University, College of Architecture. Architectural practice for 8 years. Formerly: Art Director, Manufacturers' Service Staff, American Architect and Architecture.

Art Director: Gene Hawley. Educated at Syracuse University. Post-graduate study at Paris Academie Moderne and Academie Delacluse.

THREE MAGAZINES IN ONE



As events of interest and apparent significance, they are reported in the BUILDING NEWS section. Here readers keep abreast of the trail blazers of importance to the building field.

Through a survival of the fittest, certain trends emerge in building. The DESIGN TRENDS section reviews these new trends in design and construction. This material is selected on the basis of its importance and of its probable influence on future building design and construction.

As trends become firmly established, certain standards emerge as the best-to-date solutions of basic problems. Each issue of ARCHITECTURAL RECORD, in the BUILDING TYPES section, presents a comprehensive study of a single type of building that reflects current standards of design, construction and equipment for the type of building under consideration. This sectionalized arrangement was developed after a careful study of the needs a professional architectural magazine must serve. Its purpose is to make the reader's time yield the greatest possible value.

BUILDING TYPES STUDIES AVAILABLE

During 1938, the following Building Types studies, each containing from 32 to 40 pages of text and illustrations, have been published in ARCHITECTURAL RECORD:

Hotels	January
Retail Stores	February
Residences ($7500 and Under)	March
Residences ($7500 to $15000)	April
Schools	May
Factories	June
Theaters	July
Hospitals	August
Apartments	September
Residences ($15000 to $25000)	October
Residences ($25000 and Over)	November
Office Buildings	December

To those who have or are likely to have work on any of these types of buildings, the RECORD will send reprints of these reference studies, on request, while the supply lasts.

In 1939, Record subscribers will receive twelve more such studies, the subjects to be selected on the basis of their importance to the whole field of building design.

Dodge Reports of building activity provide an accurate measure of the needs of building designers from coast to coast for complete and up-to-the-minute information on any one type of building. These statistics are carefully considered in evolving a BUILDING TYPES schedule of subjects.

EDITORIAL PERSONNEL

Desk Editor: William S. Pattison. Educated at University of Pennsylvania and Yale University School of Architecture. Formerly, Designer, W. and J. Sloane; member Editorial Staff House and Garden magazine.

Research Consultants: K. Lonberg-Holm. Educated in Denmark and Germany. Practiced architecture in Denmark and the United States. Formerly instructor in architecture at the University of Michigan. Director of Research, Sweet's Catalog Service. Technical News and Research Editor, ARCHITECTURAL RECORD, 1930-32. U. S. delegate to International Congress of Modern Architecture. Member, International Industrial Relations Institute.

C. Theodore Larson. A.B. and M., Arch., Harvard University. Nelson Robinson, Jr., Fellowship winner-architectural research in European and Mediterranean countries. Research staff, Sweet's Catalog Service. Technical News and Research editor of ARCHITECTURAL RECORD, 1932-37. Formerly associated with Boston architectural firm of Smith & Walker. Practiced in New York and Kansas City. Member, International Congress of Modern Architecture and International Industrial Relations Institute.

Consulting Editors: Abram Bastow, A.I.A., Sweet's Staff of Consulting Architects. Registered architect in New York and New Jersey. Member, Architectural League of New York.

George A. Chapman, A.I.A., Sweet's Staff of Consulting Architects. Assisted in the organization of Architects' Small House Service Bureau.

A. Lynwood Ferguson, Sweet's Staff of Consulting Architects. Technical Secretary (1920-26) and managing director (1926-1928), Structural Service Bureau.

Henry T. Langham, member of Sweet's Consulting Staff. Formerly associated, in an engineering capacity, with the National Biscuit Company, Durium Products, Inc., and other firms during a period of 10 years.

Charles G. Thoma, member of Sweet's Consulting Staff. For many years engaged in industrial marketing as salesman, sales manager, advertising manager, and merchandising consultant.

Richard Yates, member of Sweet's Consulting Staff. Formerly with the Leland Engineering Corporation, Wigan, Lancashire, England, and for the past six years engaged in industrial marketing in the United States.

1/4

ARCHITECTURAL RECORD SERVES THE ARCHITECT

The purpose of ARCHITECTURAL RECORD is to serve the architect as a useful work tool . . . an information service to make his task of designing buildings easier.

Notwithstanding the best of formal educations, and regardless of the type of projects they tackle, architects, engineers, and other building designers are faced with no kindergarten assignments today. They must, if they are to hold their own, keep posted on the ever-increasing requirements of enlightened clients, and must be aware of what is coming out of laboratories and factories to fulfill these requirements.

Nor can they rest for long on the oars of previous experience. Only change is certain, and the knowledge gained in designing building number one is of decreasing importance as they come to building number two, number three, and so on.

What they need now, and will continue to need, is a dependable and continuous flow of information. When you ponder the multiple factors currently penetrating their world, it is apparent that this information must be clearly defined and carefully organized.

Of course this always has been true to a degree, but the tempo increases with each succeeding year. Now, more than ever before, two types of information are required . . . first, product information that has been made available for the past 30 years through Sweet's Catalog File. This service, providing one type of essential information, is more complete and more in demand than ever. Here the architect has one vital source to aid him in his job.

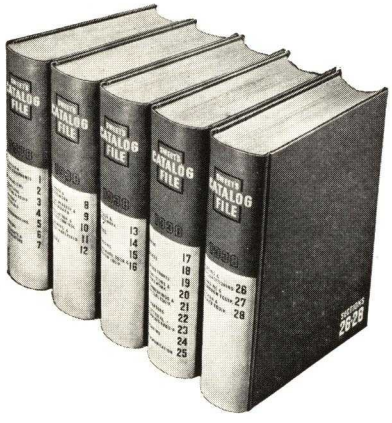
But he needs still another type of information. He needs to know what various medical authorities are finding to be desirable in modern hospitals, the pros and cons of various seating arrangements in theaters, what health authorities are setting up in new codes, what faults and virtues are shown in the work of contemporary architects — and any of a hundred other facts the present-day building designer requires.

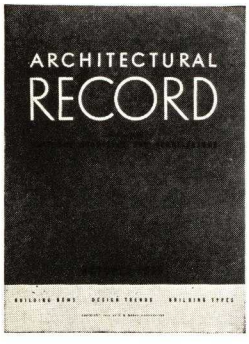
EFFICIENT INFORMATION SERVICE

Without recourse to a continuous flow of up-to-date, useful information, architects and engineers would have little time these days to give to the job of building. For efficiency's sake, they must have the right information in the right place at the right time.

This was why the publishers of ARCHITECTURAL RECORD, anticipating changing needs, started Sweet's some thirty years ago, and it is why from time to time they have re-defined the RECORD'S editorial objectives. (It is why also, as progress brings more changes, they will in the future anticipate them and re-define these objectives accordingly.) But whereas Sweet's admirably meets one vital need of the building designer, it performs only one job. The RECORD performs another. As catalogs on more and more materials, equipment, and services are filed in Sweet's, more and more standards for evaluating these must appear in the RECORD. A closer integration of the two services is mandatory. The common denomination of the two, of course, is "useful" information, and both are designed to deliver this to the right place at the right time. There, however, the relationship stops. What is defined as "useful" in Sweet's, would be out of place in the RECORD, and vice versa.

BUILDING
PRODUCT
INFORMATION





BUILDING
PERFORMANCE
INFORMATION

Because the RECORD is a single-purpose magazine, i.e., follows the building designer's problem—and no other—straight through, it is able to uncover and publish information different in function of course from that found in Sweet's but likewise of direct usefulness to him. Because this data is presented in a pre-digested and organized form, its usefulness is further enhanced.

Each month the reader receives in one time-saving package, news and reference data presented in orderly sequence, designed to keep him adequately posted on the kaleidoscopic world that is building.

F. W. DODGE CORPORATION

BUILDING TYPES

When a designer is confronted with the job of planning a building today, his primary task, as has been pointed out, is that of ferreting out all the accepted requirements relating to the particular type of structure, and of learning from innumerable sources the accepted means by which these requirements can be met.

No wonder than that his face lights up when he remembers that a recent issue of the RECORD had in its BUILDING TYPES section a 32 to 40-page study devoted to the very problem confronting him.

There, he finds data which he or his staff would have had to spend hours—in many cases, days—running to earth. Pre-digested data, authoritative data, organized data—all up-to-date, all useful. There he finds in concise, usable form, increasing attention to the standards he must have to make the best use of all the materials, equipment, and services described in Sweet's.

Every month, in addition to the information in its other two sections, a BUILDING TYPES study appears in the RECORD. One month it is focused on hospitals; the next, on apartments; the next, on stores; and so on throughout the year. If and when a given type of building becomes statistically important, it likewise becomes the subject for one of these reference studies.

GROUP EDITING

Since no one mind could have enough experience, knowledge, perception or energy to interpret adequately all that is going on in the building field today, efficiency dictates a shift from rule-of-thumb, one-man editing to editing in conformance with directions established by intelligent research. And when we say "research," we are not giving lip-service to an overworked term of the publishing world. We mean skilled, independent research, carried on, not with fluids and solids in a laboratory of test tubes, micrometers, and Bunsen burners, but with words and ideas in a laboratory of books, periodicals and relevant reports.

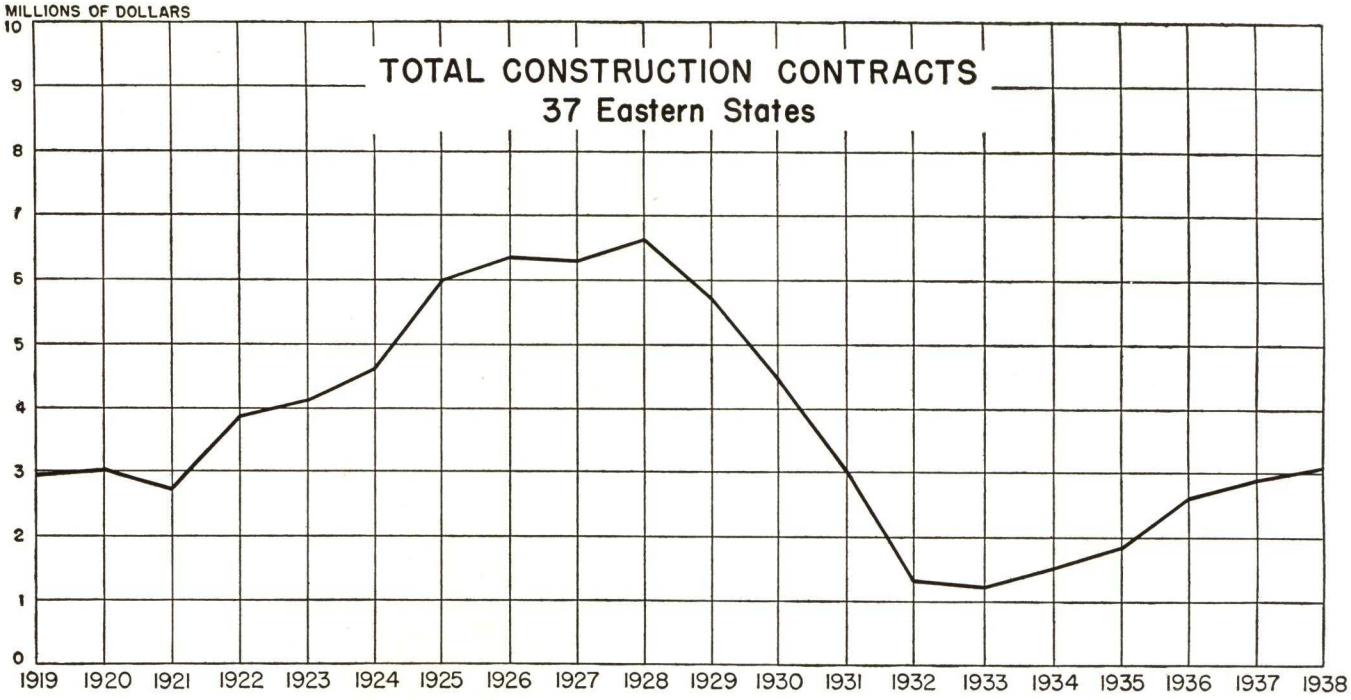
The research department, because it among other activities intelligently combs some 75 to 100 industrial, professional, and lay periodicals monthly to see what is happening that might affect building, tips off the editorial department on everything that looks promising. This department in turn adds these to any leads emanating elsewhere (e.g., Dodge Reports) and investigates. Then, at a group meeting of the editorial staff, material is selected for preparation and publication.

USEFUL CONTENTS

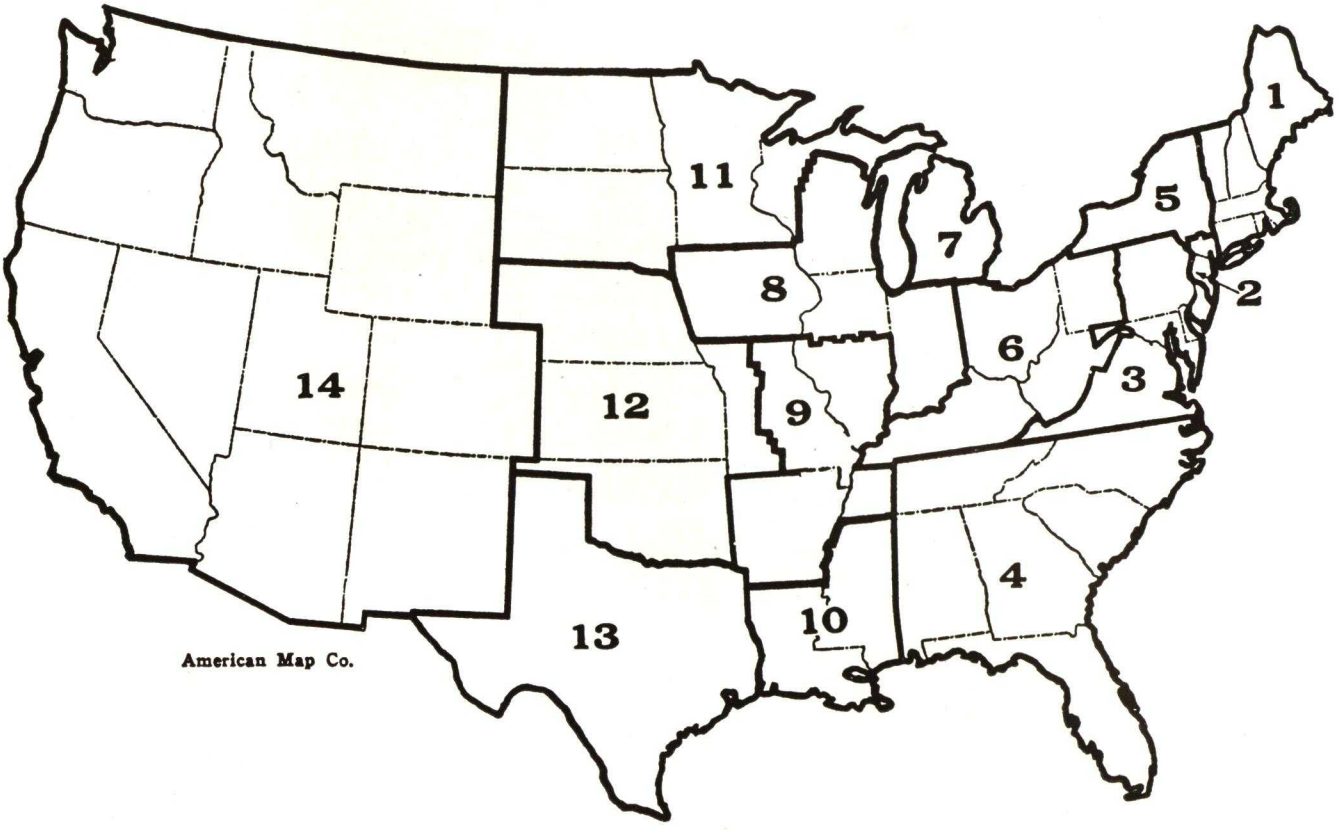
Remember the days when architectural magazines could devote about 90% of their pages to good photographs and maintain a respectable renewal percentage?

But times change. Though good photographs of course are still essential, they stop short of delivering much of the information required now. Cross-sections and longitudinal sections, plans in isometric and in perspective, working drawings and measured drawings, tables, charts, check-lists, and many other instruments are required to convey to architects and engineers the technical, informative, time-saving data they must have to keep up with progress.

Although always recognized for its emphasis on what is loosely labeled "technical" information, the RECORD stresses useful information more and more. By adhering to a single-purpose policy, it cuts its way through a maze of contradictions and complexities, and comes out with the information its readers want, presented in the way they want it. To accomplish this, it relies not alone on the experience gained since it was started in 1891, nor on its affiliation with F. W. DODGE CORPORATION, whose 750 reporters and correspondents are looking in on RECORD readers daily, nor on its up-to-date research staff teamed with its up-to-date editorial staff. As a final double-check, it periodically goes to its readers for a vote of confidence and direction. It seeks, in short, all the answers before it attempts to publish any of the answers.



The Country Has Been Divided Into Fourteen Generally Recognized Territories, The First Thirteen of Which Correspond to Those of Dodge Report Service.



F. W. DODGE CORPORATION

119 West 40th Street, New York, N. Y.

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ATLANTA	Red Rock Building	Walnut 6516
BALTIMORE	Equitable Building	Plaza 3138
BIRMINGHAM	Farley Building	Birmingham 3-8524
BOSTON	Park Square Building	Hancock 0700
BUFFALO	361 Delaware Avenue	Cleveland 8200
CHICAGO	105 West Adams Street	Dearborn 3500
CINCINNATI	800 Broadway	Parkway 2866
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COLUMBUS	12 North Third Street	Main 4505
DALLAS	Construction Building	Texas 2-9073
DAYTON	U. B. Building	Fulton 2321
DES MOINES	Old Colony Building	Des Moines 3-6279
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HOUSTON	Merchants & Mfrs. Building	Preston 9341
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JACKSONVILLE	Duval Building	Jacksonville 5-4432
KANSAS CITY	New York Life Building	Harrison 3800
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MIAMI	507 N. E. First Avenue	Miami 3-6461
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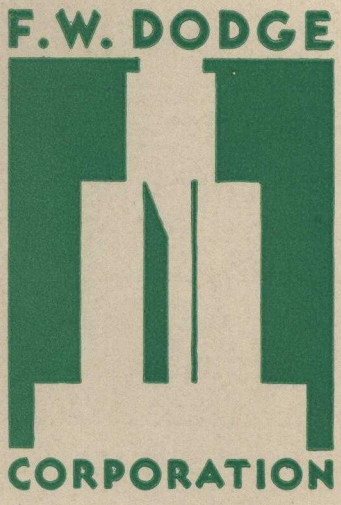
MINNEAPOLIS	407 South 4th Street	Atlantic 1474
NEW ORLEANS	Balter Building	Raymond 9871
NEW YORK	119 West 40th Street	Pennsylvania 6-1500
OKLAHOMA CITY	Petroleum Building	7-7471
PHILADELPHIA	1321 Arch Street	Locust 4326
PITTSBURGH	Bessemer Building	Atlantic 8220
ST. LOUIS	721 Olive Street	Chestnut 7390
SAN ANTONIO	Builders Exchange Building	Fanning 6873
WASHINGTON	501 13th Street, N.W.	Metropolitan 2017


F.W. DODGE
CORPORATION

FOUNDATIONS 2
- SECTION -

Section Number → 1/5 ← Catalog Number

CATALOGS 1 to 5

MANUFACTURERS

THIS INDEX INCLUDES ONLY MANUFACTURERS WHOSE CATALOGS ARE FILED IN THIS SECTION

MacArthur Concrete Pile Corp. 2/1
Raymond Concrete Pile Co., Inc. 2/2
Spencer, White & Prentis, Inc. 2/3
Underpinning & Foundation Co., Inc. 2/4
Western Foundation Co. 2/5

PRODUCTS

THIS INDEX INCLUDES ADDITIONAL INFORMATION WHICH IS FILED IN OTHER SECTIONS

Products described or illustrated in manufacturers' catalogs are indexed by section and catalog numbers. All names are listed alphabetically under each product heading.

CAISSONS
Contractors or Engineers
See Contractors—Piling; Contractors—Concrete Construction; Engineers—Concrete Construction; Engineers—Foundation

CONCRETE
Mass Construction
See Contractors—Concrete Construction

CONTRACTORS
Concrete Construction
Raymond Concrete Pile Co., Inc. 2/2
Roberts and Schaefer Co. 3/12
Rust Engineering Co. 26/130
Spencer, White & Prentis, Inc. 2/3
Western Foundation Co. 2/5

Foundation
See Engineers—Foundation; Contractors—Piling

Piling
MacArthur Concrete Pile Corp. 2/1
Raymond Concrete Pile Co., Inc. 2/2
Spencer, White & Prentis, Inc. 2/3
Underpinning & Foundation Co., Inc. 2/4
Western Foundation Co. 2/5

Shoring
See Engineers

ENGINEERS
Concrete Construction
Raymond Concrete Pile Co., Inc. 2/2
Roberts and Schaefer Co. 3/12
Rust Engineering Co. 26/130
Spencer, White & Prentis, Inc. 2/3
Western Foundation Co. 2/5

Foundation
(See also Contractors—Piling)
(Continued in Next Column)

ENGINEERS—Cont.
Foundation—Cont.
(Continued from Previous Column)
MacArthur Concrete Pile Corp. 2/1
Raymond Concrete Pile Co., Inc. 2/2
Rust Engineering Co. 26/130
Spencer, White & Prentis, Inc. 2/3
Underpinning & Foundation Co., Inc. 2/4
Western Foundation Co. 2/5

General Construction
Raymond Concrete Pile Co., Inc. 2/2
Rust Engineering Co. 26/130
Spencer, White & Prentis, Inc. 2/3

Shoring
Raymond Concrete Pile Co., Inc. 2/2
Spencer, White & Prentis, Inc. 2/3
Underpinning & Foundation Co., Inc. 2/4

FOUNDATION CONSTRUCTION
Buildings, Chimneys, Tanks, etc.
See Contractors—Piling; Engineers—General Construction; Engineers—Foundation

PILES
Composite—Wood and Concrete
MacArthur Concrete Pile Corp. 2/1
Raymond Concrete Pile Co., Inc. 2/2
Western Foundation Co. 2/5
Specifications 2/5

Concrete
(Including Precast, Cast-in-place, Pedestal)
Hercules 2/4
MacArthur Concrete Pile Corp. 2/1
Raymond Concrete Pile Co., Inc. 2/2
Spencer, White & Prentis, Inc. 2/3
Underpinning & Foundation Co., Inc. 2/4
Western Foundation Co. 2/5
Specifications 2/2; 2/5

PILES—Cont.
Concrete Filled Cylinders or Tubes
See Piles—Steel Pipe or Sheet Metal Pipe—Concrete Filled

Sheet Metal Pipe—Concrete Filled
See Piles—Steel Pipe or Sheet Metal Pipe—Concrete Filled

Steel Pipe or Sheet Metal Pipe—Concrete Filled
Hercules 2/4
MacArthur Concrete Pile Corp. 2/1
Raymond Concrete Pile Co., Inc. 2/2
Spencer, White & Prentis, Inc. 2/3
Underpinning & Foundation Co., Inc. 2/4
Western Foundation Co. 2/5

Wood — Untreated and/or Creosoted
(See also Lumber—Creosoted or Salt Treated) 8
Koppers 8/7
Western Foundation Co. 2/5
See also 11/81

PILING
Foundation
See Piles

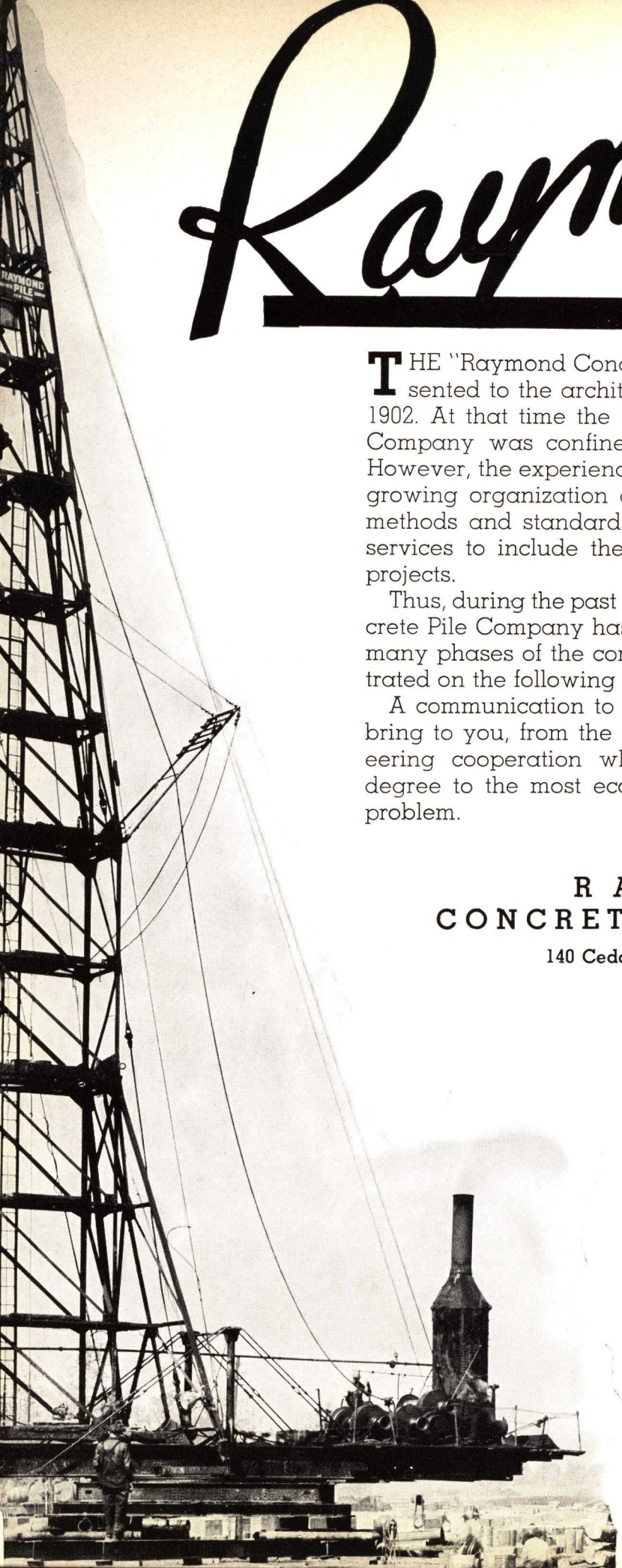
Sheet Steel, H and Z Section
J & L 12/3; 27/3
See also 3/3; 8/23; 11/85

UNDERPINNING
Buildings
(See also Piles; Contractors—Piling)
Hercules 2/4
Raymond Concrete Pile Co., Inc. 2/2
Spencer, White & Prentis, Inc. 2/3
Underpinning & Foundation Co., Inc. 2/4
See also 2/5

SECTION 2

MEMORANDA

RAYMOND
CONCRETE PILES



Raymond

THE "Raymond Concrete Pile" was developed and first presented to the architectural and engineering professions in 1902. At that time the activity of the Raymond Concrete Pile Company was confined exclusively to that foundation unit. However, the experience and facilities acquired by the rapidly growing organization and the nation-wide acceptance of its methods and standards naturally broadened its engineering services to include the design and construction of complete projects.

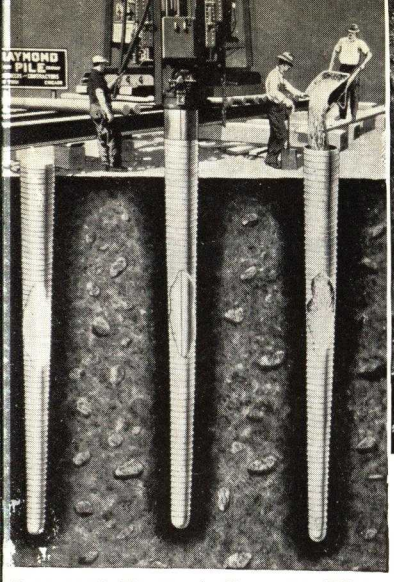
Thus, during the past quarter of a century, the Raymond Concrete Pile Company has established an enviable record in the many phases of the construction industry described and illustrated on the following pages.

A communication to any of the addresses listed below will bring to you, from the preliminary stages of a project, engineering cooperation which will contribute in an important degree to the most economical solution of your construction problem.

RAYMOND
CONCRETE PILE COMPANY

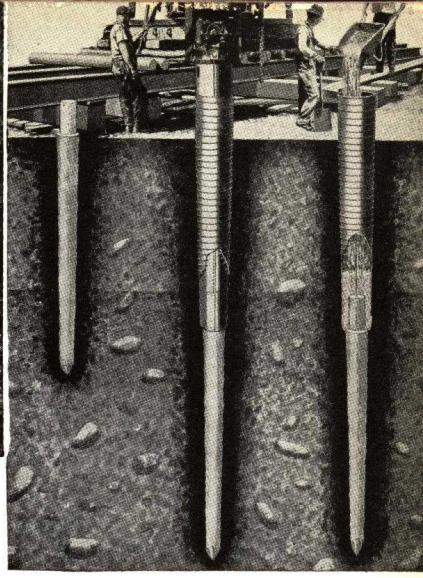
140 Cedar Street, NEW YORK, N. Y.

ATLANTA, GA.....49 Forsyth St.
BALTIMORE, MD.....S. E. cor. Fayette & Calvert Sts.
BOSTON, MASS.....31 St. James Ave.
CHICAGO, ILL.....111 W. Monroe St.
CLEVELAND, OHIO.....1740 E. 12th St.
DETROIT, MICH.....417 New Center Bldg.
LOS ANGELES, CALIF.....311 So. Spring St.
PHILADELPHIA, PA.....1520 Locust St.
PITTSBURGH, PA.....Cor. 4th Ave. & Wood St.
SAN FRANCISCO, CALIF.....333 Montgomery St.
WASHINGTON, D. C.....732—15th St., N.W.
A. C. EVERHAM.....KANSAS CITY, MO., 114 W. 10th St.
W. J. MULHALL.....MIAMI, FLA., 365 N. E. 55th St.
J. D. McCORD.....MILWAUKEE, WIS., 7106 W. North Ave.
R. S. DORNBERGER.....PORTLAND, ORE., 6323 E. 31st St.
JAS. TAUSSIG, Jr.....ST. LOUIS, MO., 214 No. 6th St.
G. W. OAKES.....ST. PAUL, MINN., 162-60 E. 6th St.
J. L. WICK.....SEATTLE, WASH., 1725 W. Lake North
RAYMOND CONCRETE PILE CO., LTD.
MONTREAL, CAN., 620 Cathcart St.
RAYMOND CONCRETE PILE CO., LTD.
TORONTO, CAN., 170 Bay St.
CIMENTACIONES Y CONSTRUCCIONES, S.A.
MEXICO CITY, D.F., Avenida 16 de Septiembre Num 5
RAYMOND CONCRETE PILE COMPANY
BOGOTA, COLOMBIA
RAYMOND CONCRETE PILE COMPANY
BARRANQUILLA, COLOMBIA
RAYMOND CONCRETE PILE COMPANY
CARACAS, VENEZUELA
RAYMOND CONCRETE PILE COMPANY
MARACAIBO, VENEZUELA



Raymond Tapered Concrete Piles: 1. Unfilled Shell ready for Inspection —2. Completely driven—3. Pouring Concrete.

A group of Standard Raymond Tapered Concrete Piles ready for the concrete footing to be poured.



Raymond Composite Piles: 1. Driven Wood Section—2. Driving completed —3. Pouring Concrete.

INDEX

of

Raymond Services

1. RAYMOND FOUNDATIONS AND ENGINEERING SERVICES....*Pages* 4 and 5

2. RAYMOND STANDARD TAPERED CONCRETE PILES.....*Pages* 6 and 7

3. RAYMOND STEP-TAPERED CONCRETE PILES.....*Pages* 8 and 9

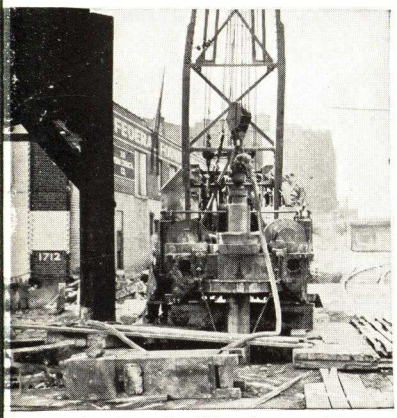
4. ADVANTAGES OF CONCRETE PILES *Pages* 10 and 11

5. COMPOSITE AND PRE-CAST PILES *Page* 12

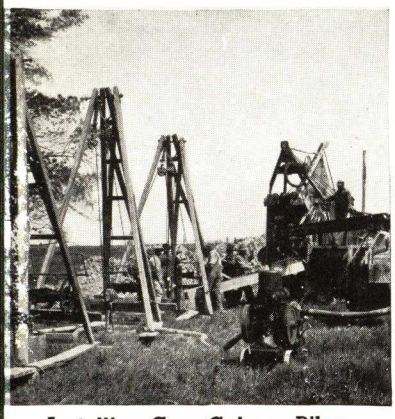
6. GENERAL (CONCRETE PILE) SPECIFICATIONS .....*Page* 13

7. UNDERPINNING AND CAISSONS *Page* 14

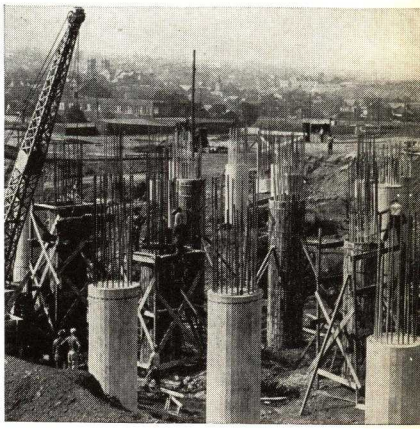
8. SPECIAL CONCRETE WORK.....*Page* 15



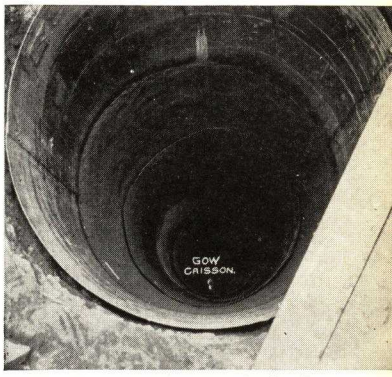
Rotary Drilling for Wet Process Type Caisson (Note water connection to drill stem).



Installing Gow Caisson Piles.

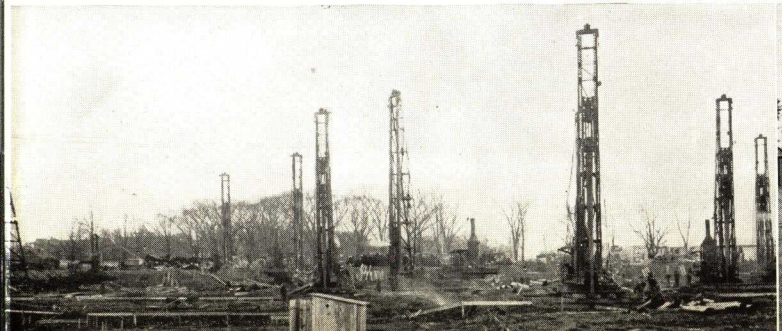


Gow Caissons, ready for foundation beams—Caissons are belled out in rock approximately 40 feet below surface and built up 20 feet to grade.



Gow Caisson Pile, ready for Inspection and Concrete.

Below: A fleet of eight Raymond Steel Drivers on a job consisting of more than 18,000 Raymond Concrete Piles.



Below: A supply of heavy gauge 24 foot pipe sections of Raymond Step Tapered Composite Piles.

OFFICE BUILDING, Houston, Texas
John Eberson, Architect
Supported on
1346 RAYMOND CONCRETE PILES

A BUILDING IS AS GOOD AS ITS FOUNDATION

However well a building may be constructed, it must have a proper foundation. Usually it is inadvisable to design a building before tests of the ground at the site are made. Soil tests disclose conditions below the surface of the ground, and if deficiencies in bearing values exist, they may be taken into consideration when designing the structure and fixing its location.

Where ample land is available, it has been found advantageous on many occasions to re-locate the building. Rock ledges, out-croppings, springs, quick-sand, fill, soft deposits, etc., are frequently avoided by changes of locations on the same site.

RAYMOND

Their Importance to the Architect and Engineer

It is common knowledge that the successful erection and length of service of any building depends to an important degree upon the stability of the foundation. Where the foundation goes to an appreciable depth, or the building is large and of permanent character, information regarding the stratum or material upon which the foundation will rest is essential. In the case of piles, driven through various strata, it is necessary to know how the resistance developed by the driving will react in each stratum. Accurate calculations for foundations, with or without piles, can only be made when driving and load tests have been made and analyzed **by experts of long experience.**

A brief summary of the services of this type conducted by our Engineering Staff follows.

FOUNDATIONS FOR ENGINEERING PROJECTS

It is important to have accurate soil information at an early stage of a proposed operation. A comprehensive report on subsurface conditions, prepared by a nationally recognized concern, may determine the practicability or impracticability of a proposed bridge or tunnel location—a point which is of inestimable value both from an engineering and an economic viewpoint.

UNDERPINNING

The usual object of underpinning is to permit carrying the foundation of a building below that of adjoining buildings. Underpinning may be required, also, because of changes in soil conditions due to the digging of subways, construction of deep sewers, lowering of water levels, etc. Such conditions often entail considerable trouble and expense. Competently handled, underpinning can be installed without serious disturbance of adjacent property. This type of service is described in greater detail on later pages.

TEST BORINGS

Soil Tests and Investigation

The Gow Division of the Raymond Concrete Pile Company supplies necessary information regarding soil conditions on a proposed site by two methods: (1) Driving a specially designed spoon into the earth through a guide casing and reclaiming characteristic samples in **as nearly the actual existing state as possible.** (2) Boring through boulders, hardpan, etc. (where it is necessary), recovering cored samples of the ledge.

A complete log is kept of the soils encountered, their geological classifications and other pertinent information, such as water levels. This log is submitted, together with boring samples, when the report is furnished.

Laboratory Analysis

The Gow Division has developed equipment and methods for obtaining large "undisturbed soil samples" (from 3 to 5 inches in diameter) for laboratory analysis to determine bearing values of soils in the areas to be loaded. By this method, probable settlements corresponding to the loads proposed can be definitely established.

FOUNDATIONS & ENGINEERING SERVICES

INTERPRETING BORINGS AND TESTS

The Value of Experience

From more than thirty-six years of pile driving, under the greatest variety of soil conditions and locations all over the country, the Raymond Company has acquired information, permanent records and test data relating to nearly every section. Tests conducted and interpreted with this background of wide experience are of unquestioned value to prospective builders. The amount of preliminary information in our files alone will prove materially helpful to anyone confronted with a foundation problem.

DETERMINING ALLOWABLE LOADS

The allowable load per pile is naturally one of the first matters to be considered in a pile foundation. No hard and fast rules can be laid down and followed. The character and general purposes of the structure, the nature of the soil to be penetrated, and the bearing strata reached, as well as the size, shape, length, and type of the pile under consideration, are determining factors. The most generally accepted unit loading for concrete piles is 30 tons per pile. Under certain conditions, unit loads may have to be reduced, while under others, greater loads may be carried safely. Long experience with every sort of condition is of greater value than theory in determining the allowable load per pile.

CARRYING CAPACITIES OF CONCRETE PILES

The carrying capacity of concrete piles under given conditions need not, and should not, be a matter of guesswork. Carrying capacity can be safely determined, provided always that correct methods of construction are followed. Well known formulae may be considered as a general guide but must be interpreted in the light of broad experience. The formula generally used is that known as the "Engineering News Formula," based upon the use of a single-acting steam hammer, as follows:

$$L = \frac{2WH}{S + 0.1}$$

L = Safe load in pounds.
W = Weight of falling parts in pounds.
H = Drop in feet of falling parts.
S = Final penetration per blow in inches.
In a No. 1 steam hammer, W = 5,000 and H = 3
In a No. 2 steam hammer, W = 3,000 and H = 2½

Ordinarily, Raymond piles are driven to four blows to the last inch with a No. 1 steam hammer, for a working load of 30 tons per pile, thus adding 43% to the safety factor of the formula.

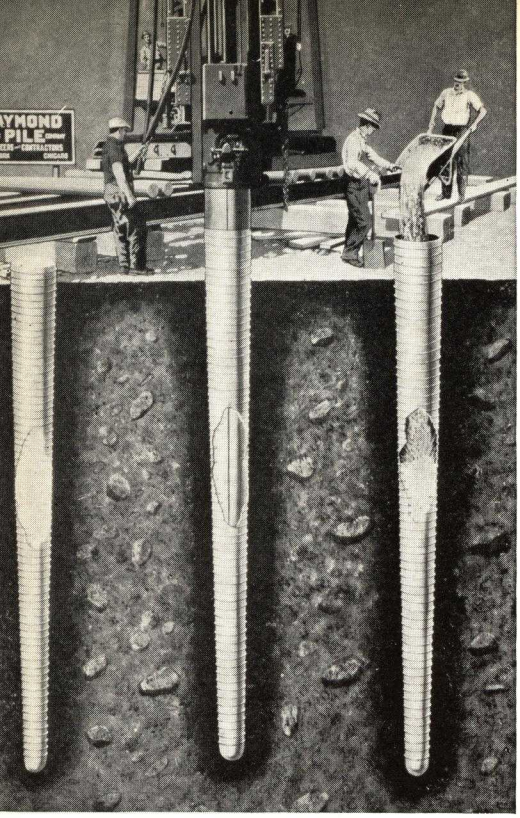
Test Piles

If the soil in which the pile has its bearing is reasonably uniform or well known, and the underlying soil is free from vegetable matter, and **if the method followed is such that it can be known that no injury is suffered in driving,** it is usually a waste of money to make load tests. Experience has shown that driving to a uniform resistance will serve all practical purposes.

OBTAINING FOUNDATION ENGINEERING SERVICE

The organization making tests such as those described should have three qualifications. First—long and broad experience; Second—a reputation for integrity; and Third—an absolutely unbiased attitude regarding the condition under consideration. The Raymond Concrete Pile Company has made tests of every description, and has installed foundations of every kind in every section of this country, and in many foreign countries. Raymond representatives are competent to advise with architects, engineers, and owners, and to offer suggestions free from bias. While the Company is interested in the installation of various types of concrete piles, caissons, and poured foundations, it will always endeavor to recommend the proper type of foundation.

CITY HALL, Atlanta, Georgia
G. Lloyd Preacher & Co., Architects
Supported on
290 RAYMOND CONCRETE PILES



Cut-away views of RAYMOND TAPERED CONCRETE Piles at successive stages of installation—CENTER, pile driven to grade—RIGHT concrete being poured—LEFT, ready for inspection.

RAYMOND

STANDARD TAPERED CONCRETE PILES

From the standpoint of general use and acceptance, the tapered type of pile has led all others in the concrete pile field for the past thirty-six years. Its successful experience, its record of usefulness, and its sterling performance have been dominant factors in the development of the concrete pile industry in the United States and in many places abroad.

The value of the taper has been proved in literally thousands of structures of infinite variety, ranging from small dwellings to mammouth industrial buildings and towering skyscrapers. Structures resting on Raymond Tapered Concrete Piles dot the United States, are found in the Philippines, China and Sumatra, and from Newfoundland to the Argentine Republic.

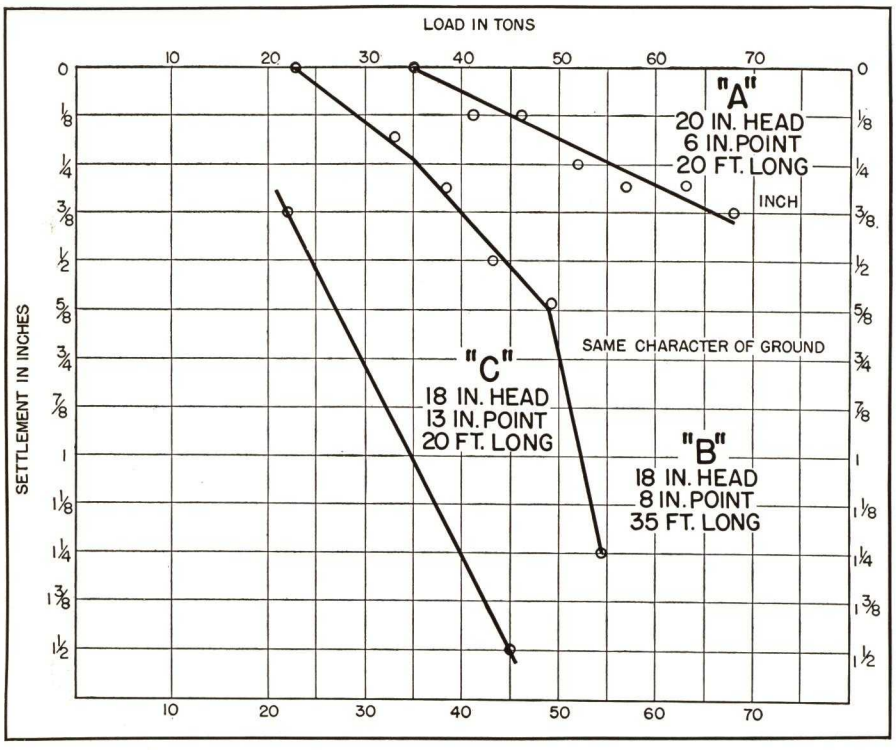
THE RECOGNIZED VIRTUES OF THE TAPER

1. The maximum of bearing value is developed in every square inch of soil in contact throughout the pile's entire length.

2. Due to the tapering wedge shape, the **pile cannot settle the smallest fraction of an inch without forcing lateral movement** of every square inch of soil in contact with its surface.

3. It follows that, except for point bearing conditions, **Raymond Concrete Tapered Piles assure the desired load carrying capacity with shorter lengths** than would be required if parallel-sided piles were used—or conversely, should tapered and parallel-sided piles be driven to the same length, **the tapered pile will carry the greater load** (see chart below), and if driven for the same load the tapered pile would be shorter.

COMPARATIVE BEARING TEST RESULTS



The following test was made under the supervision of a prominent engineer—Two piles, each twenty feet long, were driven within a few feet of each other. "Pile A," was 6 inches in diameter at the point and 20 inches in diameter at the top, "Pile C," was 13 inches in diameter at the point and 18 inches in diameter at the top. "Pile C" drove fairly hard from the start, and required 944 blows of the steam hammer to secure a penetration of twenty feet. "Pile A," with the smaller point, started easily and required only 875 blows to secure twenty feet of penetration.

At the expiration of a month, both piles were loaded and carefully tested. "Pile A," the pile with the greater taper, carried a proportionately greater load, showing no appreciable settlement up to sixty-five tons; whereas "Pile C," the less tapered pile, showed the same settlement with a load slightly more than twenty tons. The result is particularly interesting in view of the fact that the engineer who made the tests did so for the specific purpose of showing that a pile of large surface area had greater carrying capacity than a pile which, even though smaller, was more heavily tapered. The results of these tests have been confirmed many times in the course of our experience.

Standard Tapered CONCRETE PILES

COMPARATIVE COST OF TAPERED VS. NON-TAPERED PILES

The failure to appreciate the greater carrying capacity of the Raymond Tapered Pile has unexpectedly increased the cost of many concrete pile foundations, contracts for which were awarded solely on the basis of the **lowest price per lineal foot,** without consideration of the probable length to which each type might be driven.

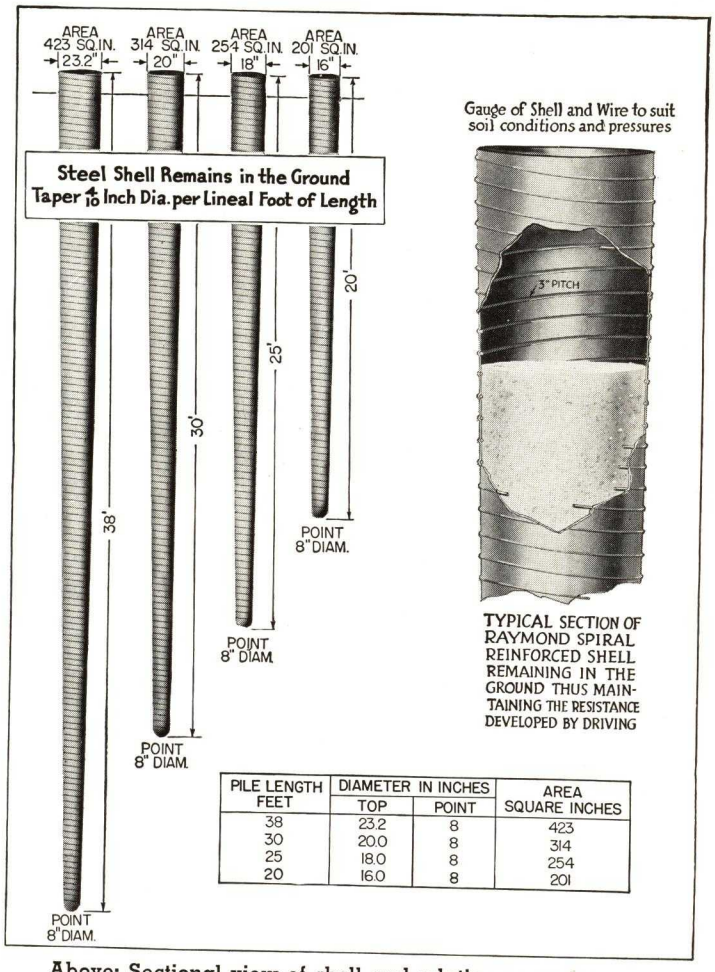
It is, therefore, obvious that the bidder who bases his price per foot on the use of a pile of uniform diameter throughout its length may realize that, unless the site overlies hardpan or rock, he will obtain a very much greater average length of pile than will his competitor who bids on a tapered pile.

OBSERVATION OF PENETRATION DURING DRIVING

Since in placing a Raymond pile the weights of the driving core and hammer are constant, and since the method of installation is such that one pile must be like another, it is possible to determine the safe load each pile can be relied upon to support. This is done by observing the penetration under each blow of the hammer, and by noting the final resistance as measured in terms of average penetration per blow for the last inch.

OVERCOMING ANY DEFECTS

Should it appear, upon inspection, that a shell has been torn in driving, or should unsuspected pressures develop at some point, resulting in the entrance of water or other foreign substance, the defect can be immediately remedied by the insertion of another shell, driving it to resistance before the concrete is poured. Any distortion that may occur in a pile made without a form, or with a temporary form—any fracture that may occur in the driving of a precast pile—must of necessity remain hidden. Subsequent settlement may call attention to the existence, though not to the extent nor the nature, of the concealed fault.



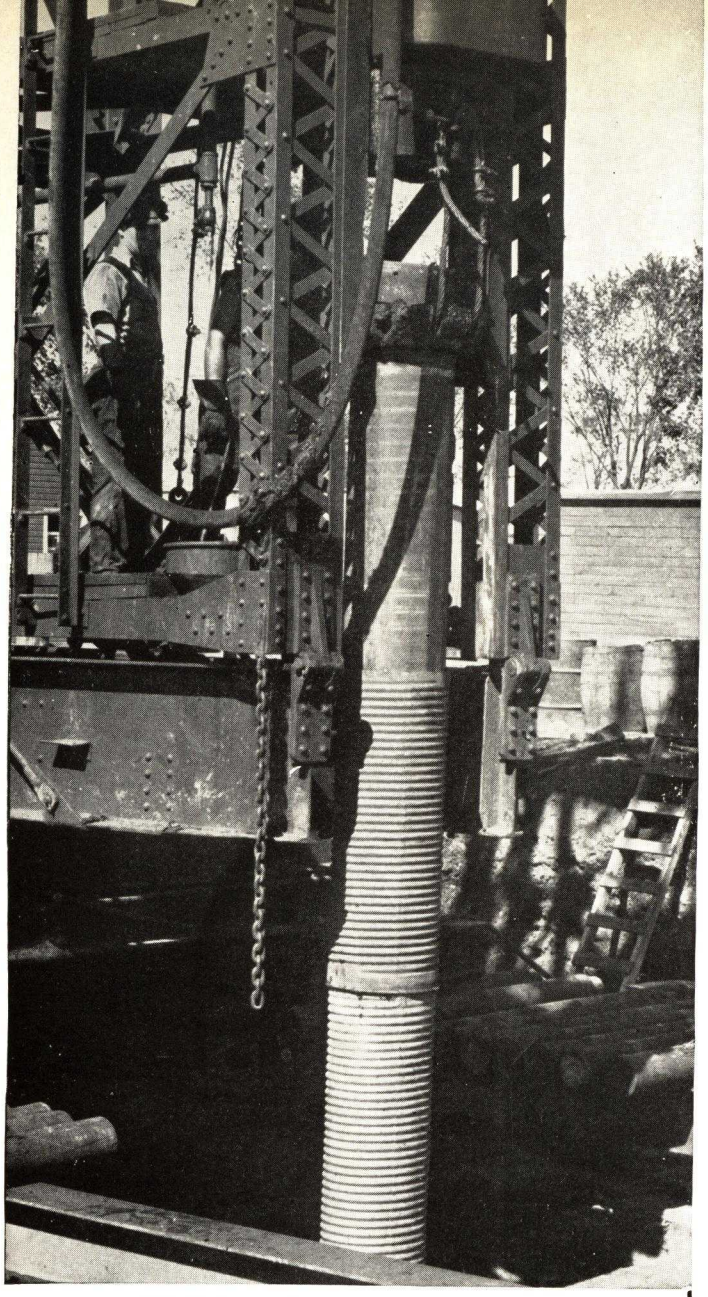
PILE LENGTH FEET	DIAMETER IN INCHES		AREA SQUARE INCHES
	TOP	POINT	
38	23.2	8	423
30	20.0	8	314
25	18.0	8	254
20	16.0	8	201

Above: Sectional view of shell and relative cross sectional areas of Raymond Tapered Piles.

CONSTANT INSPECTION

Attention is directed to illustrations showing the construction of the "left-in place" shell made of steel of the proper gauge, and spirally reinforced to the degree which examination of each pile, after driving, shows to be adequate. This means inspection after every operation is completed, except the pouring of the concrete. Thus the hazards of distortion and loss of resistance are eliminated.

Below: A large group of RAYMOND STANDARD TAPERED CONCRETE Piles complete and ready for footings—Note spacing, alignment and uniform grades.



RAYMOND STEP-TAPERED Pile partially driven.

CLASSIFICATION OF INDUSTRIAL USES OF THE RAYMOND STEP-TAPERED PILE

The Raymond Step-Tapered Pile has received universal acceptance in the engineering and construction world. The clientele making use of this type of pile to meet its special requirements classifies roughly as follows:

Contract	Projects	Piles	Lineal Feet
U. S. Government Projects	20	27,700	830,000
Oil Companies	8	7,100	262,000
States, Counties and Municipalities	58	23,100	915,000
Railroads, Viaducts, Grade Separations, etc.	9	2,600	90,000
Automobile Plants	9	8,200	439,000
Steel Plants	7	15,600	800,000
Miscellaneous Industrial Structures	44	13,100	431,000
Miscellaneous Structures, such as Office Buildings, Schools, Churches, etc.	30	9,800	707,000

RAYMOND

For Pile Construction up to 100 Ft. and Over

Early in 1931, the Raymond Concrete Pile Company developed the Raymond Step-Tapered Concrete Pile, embodying the fundamentals of the original Raymond Standard Tapered Pile, but permitting of increased lengths up to 100 ft. and over.

Raymond Step-Tapered Piles provide an efficient and economical foundation solution where: (1) soil is of doubtful supporting value to a depth of 30 ft. or more, but is underlain by rock, hardpan or gravel into which the pile points may be driven, (2) hard soil, difficult to penetrate though unreliable because of yielding strata between it and sound footing, which must be penetrated by the piles, (3) alternate strata of hard and soft material which must be penetrated to reach firm bearing.

RANGE OF GEOGRAPHIC ADAPTATION

Projects employing Raymond Step-Tapered Piles have been located in various states from coast to coast, and from Canada to the Gulf. They have included the placing, through fill and silt, rock, clay, sand and shifting soil; of as many as 12,000 piles in a single project and as few as 8, ranging in length from 16 to 100 feet or more.

CONSTRUCTION

The shell is in sections, spirally corrugated to provide increased resistance to external pressures. The "steps" result from successive diameter increases from the point upward—usually 1" in eight feet. To the bottom of each section is welded a double flange plow ring, to the lower flange of which is welded a short spirally corrugated inner sleeve, so that each section is screw-connected to the section below. A heavy gauge hemispherical steel boot, welded to the lowest plow ring, forms the point of the shell.

Step Tapered CONCRETE PILES

The gauges of metal used generally vary from 20 to 14 but are, in some instances, as heavy as #10 or as light as #24, depending on the nature of the soil to be penetrated, and the pressures to be retained. Lighter sections are used nearer the surface of the ground. All seams of the shell sections are electrically welded and watertight.

The heavy walled, hollow core has a "stepped" outer surface to correspond to the steps of the shell. These "steps" which are beveled, bear directly on the beveled inner surfaces of the plow-rings of each shell section.

Various lengths and sizes of cores are built to fit the requirements of particular jobs and for specific conditions

INSTALLATION UNDER SEVERE DRIVING CONDITIONS

On several jobs where the Raymond Step-Tapered Pile has been used, driving conditions have been so severe that it has been necessary to continue the driving to a degree of hammer resistance heretofore unknown. For instance, on one pile we have a record of driving with a 5000 lb. hammer falling 3 ft. and operating sixty blows to the minute for a period of 63 minutes and, in another instance, a total on one pile of more than 5200 blows with a No. 1 hammer to secure a penetration of about 31 ft. in order to reach rock. In both instances, upon withdrawal of the driving core, the shell was found to be undamaged and a perfect form for the concrete.

Below: Stock Pile of RAYMOND STEP-TAPERED Shells nested as shipped.

RAYMOND STEP-TAPERED Shell Screw-Ends showing plow ring and screw collars for joining into full length shell unit.

DIMENSION DATA

The usual dimensions of Raymond Step-Tapered Piles are as follows:

Length	Top Diameter	Point Diameter
*16 feet	11 7/8 inches	10 5/8 inches
*24 feet	12 7/8 inches	10 5/8 inches
*32 feet	13 7/8 inches	10 5/8 inches
40 feet	14 7/8 inches	10 5/8 inches
48 feet	15 7/8 inches	10 5/8 inches
56 feet	15 7/8 inches	9 3/4 inches
64 feet	15 7/8 inches	8 7/8 inches
72 feet	17 inches	8 7/8 inches
80 feet	17 inches	8 7/8 inches
88 feet	17 inches	8 7/8 inches

*When for any reason a greater cross-section appears to be desirable, it is possible to accomplish this by removing the lower sections of the core and using two or more of the upper sections with driving points of corresponding size adapted thereto, thus:

A pile 32 ft. in length might have a top diameter of 15 7/8 in. and a point diameter of 12 7/8 in., or

A pile 24 ft. in length might have a top diameter of 15 7/8 in. and a point diameter of 13 7/8 in., or

Other combinations may be used to suit the requirements of a particular situation, such as the use under certain conditions of a 10 or 12 in. diameter pipe or other steel member extending below the regular shell, and permitting the pile to reach bearing in extraordinarily deep strata. Details of these combinations will be supplied in each instance as occasion may call for them.

CONCRETE PILE ADVANTAGES

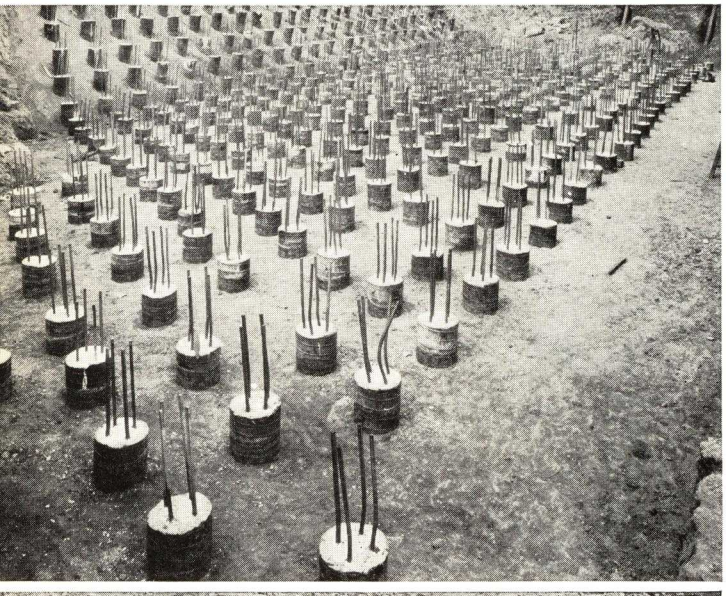
ABSOLUTE PERMANENCY

Concrete piles, not being subject to decay or attacks of wood borers and other destroying agents are, naturally, far more permanent than wood piles.

This permanency of concrete piles, regardless of moisture conditions, naturally eliminates the excavation, sheeting, shoring and pumping necessary, in the case of wood piles, to reach a cut-off below permanent water level. The concrete pile heads can be left at an elevation only sufficiently below the floor line to permit of the proper distribution of loads.

RAYMOND TAPERED CONCRETE Piles in abutment of Glendale-Hyperion Viaduct over Los Angeles River—Note five rows of battered piles in background.

Below: A six-pile pier of RAYMOND STEP TAPERED CONCRETE Piles.



GREATER CARRYING CAPACITY

The greater carrying capacity of concrete piles arises from several factors such as (a) They have greater size, therefore greater displacement. (b) Perfect shape—of uniform size and straightness—thus insuring full ground contact and centering of the load over the point of the pile. (c) Possibility (with the Raymond type of pile) of inspection after driving, hence the ability to load to greater capacity, instead of making allowances for inefficiency as in the case of wood piles, which are subject to injury by overdriving, telescoping, departing from the vertical and like defects, **none of which are discernible after driving begins.**

CENTERING OF COLUMNS

All designers appreciate the advantage of keeping their column centers as near as possible to the center of gravity of the pile groups, thus reducing, and in many cases avoiding, expensive cantilevers. This is no small consideration when wide footings and limited property lines result in eccentric loads which cannot be otherwise provided for.

SAVING IN TIME

The principal reasons for the time saving accomplished by the use of concrete piles are, (a) The smaller number of piles required. (b) The reduction in quantities of excavation, shoring, sheeting and pumping. (c) The reduction in quantities of footings or masonry. (d) The manufacture of the piles in place, from materials readily procurable in all localities, and (with the Raymond type of pile) limiting of manufacture to the actual number and length of piles required. This obviates delay for cutting and trimming trees, hauling to shipping point, transporting for great distances by rail or water and delivery to the job, perhaps only to find that the piles are too long or too short.

It is frequently the case that a concrete pile foundation can be completely installed in less time than would be required for the necessary materials for a wood pile foundation to be delivered to the site.

The Raymond Concrete Pile Company, with its organization and equipment so widely distributed over the United States, is in a particularly favorable position to give prompt service and has a reputation for completing its contracts on time.

WOOD PILING AND SHIFTING WATER LEVELS

Many authorities agree that wood piling would be of permanent value (unless exposed to the attacks of subaqueous "borers" or other simliar deletorious conditions), **if constantly saturated or submerged.** The problem of **maintaining saturation,** however, is becoming more and more difficult. Changes in water level, once a problem only where tides or currents had to be considered, now confronts the architect in the midst of large cities where subways, sewers and other structures affecting underground water level are constantly being constructed. It can no longer be assumed that piles whose tops are well under water when the foundation is built will still be beneath water level a few years later.

Examples of some of the effects on wood piling produced by this cause are illustrated on this page.

Above: Old wood piles in Pier No. 6 and No. 7, Central Harlem Health Center, New York City. Water level 2 feet below water shown in picture. Note condition of all wood piles.

CONCRETE PILE CLASSIFICATIONS

Broadly speaking, concrete piles are of two distinct types:

(1) Piles which are poured or cast in forms previously driven in the ground, referred to as "cast-in-place" piles.

(2) Piles which are cast in forms, above ground, then driven like wooden piles—referred to as "precast" piles.

The Raymond Pile is the outstanding example of the type involving the use of an economical permanent form which is **driven in contact with the soil and left in the ground to preserve driving compression** and the integrity of the finished pile. This **driven, permanent** steel shell is essential to dependable results for these reasons:

(1) It serves as a form for the concrete.

(2) It prevents the admixture of foreign substances with the concrete, and protects it from excess of ground water during the cement setting period.

(3) It retains the original moisture in the concrete until it is thoroughly hardened.

(4) It prevents distortion by external pressure, due to the driving of adjacent piles or accumulated pressures from displacements by the pile itself.

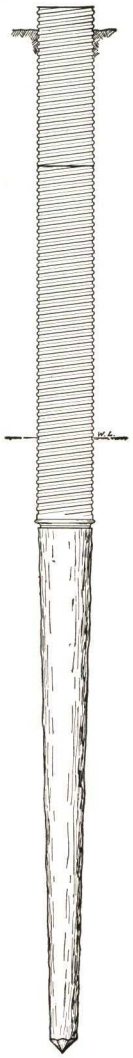
(5) It retains perfectly the displaced earth forming the walls of the cavity, so that there may be no relaxation of the ground and, therefore, no loss of the original driving compression.

(6) It acts as reinforcement of the pile until the concrete shall have attained its maximum strength.

It is only necessary to point out these functions of the "shell" to demonstrate that, in the "cast-in-place" type, where no shell is used or where the concrete is placed loosely in the ground, vital safeguards are omitted as a result of false economy. All the points raised as to the necessity of the shell apply with equal force as **arguments against its omission.**

Left: Rotting Wooden Piles on Site of Cattle Pen Building, Pennsylvania Railroad, Philadelphia, Pa.

COMPOSITE AND PRE-CAST PILES



Composite Pile Assembled.

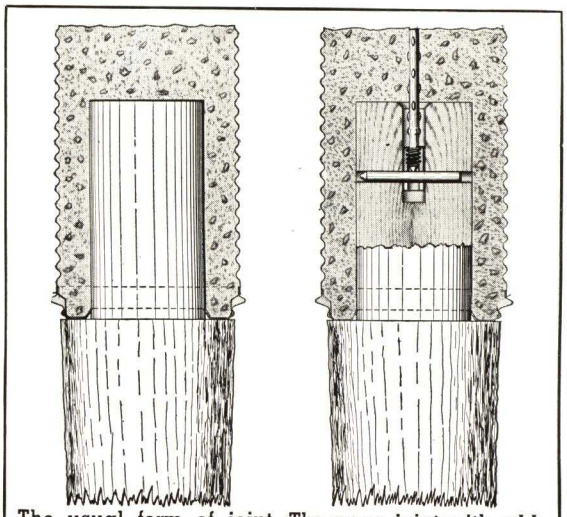
ADVANTAGES OF THE COMPOSITE PILE

As previously explained in this catalog, wood piles can be successfully used **where there is assurance of permanency of saturation.** Where deep piling is indicated and the ground water level is shifting in nature, the composite pile (an early development of the Raymond Concrete Pile Company), has been found to efficiently and economically provide the solution.

This type of pile, as its designation implies, comprises a cast-in-place concrete pile superimposed upon a wood pile. The respective lengths of the concrete and wood sections depend on the elevation of permanent water level in relation to the ground surface, and the depth at which firm bearing may be reached. In general, the load is carried by the wood pile, the concrete section acting as a column through that portion of the soil not continuously saturated. The concrete section may be either cast-in-place or pre-cast, straight-sided or tapered.

CAST-IN-PLACE UPPER SECTIONS

Pre-cast upper sections are seldom economical and seldom used because lengths must be predetermined. The cast-in-place upper section is therefore preferable, since its length can be varied as required. Should the wood pile section fail to reach firm bearing at the expected length, the concrete section, if cast-in-place, may be correspondingly increased in length.



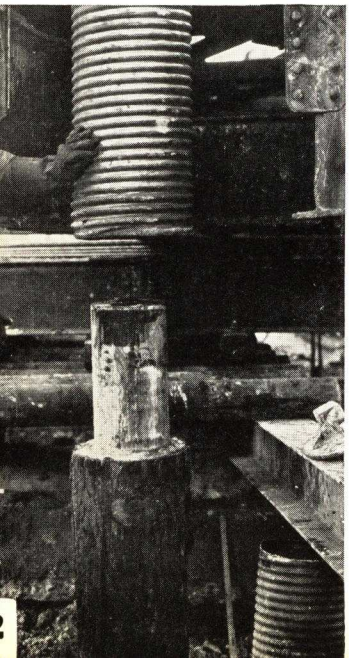
The usual form of joint between the cast-in-place concrete upper section and the wood section of a composite pile as applied by the Raymond Concrete Pile Company.

The same joint with added advantage of lock-pin and bar — Observe bite of shell sealing ring into wood tenon.

PRE-CAST PILES

Pre-Cast Piles, although infrequently used for building foundation work, have a large and useful field in the construction of docks, bulkheads and other marine structures.

As Pre-Cast Piles are manufactured before being driven, it is necessary to determine the length of pile required a considerable length of time in advance of driving. As this can seldom be accurately done, some waste is involved in length allowances and subsequent cutting off of over-long piles.



Above: Wood sections of composite piles with machine cut tenons.

Left: Shell enveloped core being lowered over driven wood section for final driving.

GENERAL CONCRETE PILE SPECIFICATIONS

The following specifications for cast-in-place piles and an alternative specification for precast piles conform with the general requirements of all the principal cities in the United States, for piles up to 60 ft. in length. For piles in excess of 60 ft. in length, these specifications should be modified slightly. The Raymond Concrete Pile Company's representative will be glad to discuss these modifications in detail.

CONCRETE PILES:

Where indicated on the drawings, furnish and place the required number of concrete piles as specified, to support the foundations. Excavation shall be made to the pile cut-off before any piles are driven. Concrete piles shall be either cast-in-place or precast piles.

CAST-IN-PLACE PILES:

Cast-in-place piles shall have steel shells driven to the required bearing, the shells being left permanently in place and filled with concrete. All shells shall be of sufficient strength and rigidity to permit of their driving, and to prevent distortion caused by soil pressures or the driving of adjacent piles. The shells shall also be sufficiently water-tight to exclude water during the placing of the concrete.

Piles shall be cylindrical or tapered. If tapered, they may be either of a constant increase in diameter or uniformly stepped. The minimum diameter of cylindrical piles shall be 14", and the minimum diameter of tapered piles shall be 8" at the point and 14" at the head. The average diameter shall be not less than 11".

Concrete shall be composed of one part approved Portland cement to three parts clean, sharp sand, and five parts of gravel or crushed stone of suitable quality, thoroughly mixed and properly proportioned as to water content. All coarse aggregate to pass a 3/4" ring.

The use of piles in which fresh or unset concrete is placed against the soil will not be permitted.

PRECAST PILES

Precast piles shall be of uniform cross-section or tapered, and shall have at least an average cross-section area of 196 square inches up to 20' in length and 225 square inches if in excess of 20'. They shall be reinforced with longitudinal reinforcing steel not less than 2% of the average gross cross sectional area of the pile and any additional reinforcing steel necessary to take care of the stresses due to handling or driving. Lateral reinforcing shall consist of 1/4" diameter hoops spaced 12" on center for the full length of the pile, excepting for 3' at the head and point where the hooping shall be not over 3" on center. There shall be at least 2" of concrete protection outside the reinforcing steel.

Forms shall be tight and rigid to prevent leakage or distortion. All piles shall be plainly marked with the casting date and shall be cured for a period of 30 days and shall not be handled or removed from the casting platform prior to this time without the approval of the Engineer. Piles must be cured at an even temperature in order that they may get a proper set; therefore, in warm weather they should be kept moist for a time, while in cold weather they shall be heated until they have properly set and cured. If cast in tiers, the lower piles shall be at least 14 days old before any superimposed load is placed upon them.

If precast piles are used, the Contractor shall drive enough test piles to predetermine the length of pile required to secure the specified bearing and required penetrations in the various areas of the work. These tests shall be made sufficiently in advance of the pile driving to prevent delay in the progress of the work, and to enable the Contractor to have on hand at all times, piles of proper length to meet any condition that may arise.

Concrete shall be composed of one part approved Portland cement to two parts of clean, sharp sand and four parts clean gravel or crushed stone, thoroughly mixed and properly proportioned as to water content.

DRIVING:

All piles shall be driven to a resistance satisfactory to the Engineer, by such methods as will not impair their strength and as will insure the retention of that resistance.

Jetting shall only be done when permitted by the Engineer. When piles are jetted, they shall be driven to the required resistance after jetting has ceased.

The driving of all piles shall be continuous, without intermission, until the pile has been driven to its final resistance.

All cushions must be approved by the Engineer. No free swinging leads will be permitted, and the equipment shall provide adequate support to firmly hold the pile in correct position while being driven.

The pile shall be driven to a sufficient depth to carry the imposed loads, and the Engineering News formula shall be considered to indicate the load that can be safely supported by a pile. The pile driving hammer shall develop an energy per blow of at least 12,000 foot pounds.

PAYMENT:

All piles shall be measured from the point to the cut-off elevation shown on the plans. No payment will be made for withdrawn, broken or rejected piles, nor for portions of piles remaining above the cut-off.

The following is a suggested specification for use when conditions indicate the desirability of composite piles.

COMPOSITE PILES:

Composite piles shall consist of a concrete section from the bottom of the footing to 1' below water level, superimposed upon a wood pile of suitable size and length. The concrete portion of the pile shall be of such cross-section that the load placed upon it shall not exceed 350 lbs. per square inch of area. The wood pile shall have a minimum diameter of not less than 13" two feet from the head and a minimum diameter of 6" at the point, except that where piles exceed 60' in length point diameters may be not less than 5".

Wood Pile Section:

All piles shall be sound and free from sharp crooks or bends and sufficiently straight so that a line drawn from the center of the head to the center of the point will lie wholly within the pile. The joint between the concrete and wood sections shall be so constructed as to exclude water or other foreign materials and shall be of sufficient strength so as to provide against an uplift of 10 tons without separation.

Concrete Pile Section:

Concrete shall consist of one part approved Portland cement, two parts clean, sharp sand, and four parts clean gravel or crushed stone, thoroughly mixed and properly proportioned as to water content; all coarse aggregate to pass a 3/4" ring. In no case shall fresh or unset concrete be placed in contact with the surrounding soil.

2 UNDERPINNING AND CAISSONS

Necessity for underpinning is generally incidental to: (a) The protection of structures from settlement damage due to nearby operations, such as adjacent basement, sewer, or other excavations being carried to or below the elevation of the original footing. (b) Correcting original foundation errors where settlement has developed due to compression of the soil. (c) Reinforcement of the foundation to provide for additional stories or increased loadings, sometimes because of changes in the uses of the building itself.

The type of underpinning most suitable depends upon the character of the original foundation, the design of the substructure, and the conditions under which the underpinning must be carried on with the least disturbance to current normal operations. Under certain conditions, sectional piles jacked down to suitable bearing, using the original walls and footings for reaction, are the most practical and economical. In other cases, caissons are preferable. Under still other circumstances, it is desirable to carry the original footings deeper to a better subsoil bearing.

GOW CAISSON PILES

Caissons of this type are installed by the Gow Division of the Raymond Company, and, when ground conditions are suitable, are probably the least expensive type.

Excavation is done by hand inside of steel cylinders. A shallow starting pit is excavated first and the top cylinder is driven down in this pit; soil inside this cylinder is then excavated. A second cylinder, about 2 in. smaller in diameter, is placed inside the first one and driven down and the entire process is repeated until caisson reaches its full depth. The lowest cylinder is driven into the final bearing stratum to seal off.

The lower section is then filled with concrete and the lower **cylinder** withdrawn. The next cylinder is then filled and withdrawn, etc., until all are withdrawn, leaving the completed caisson in place (usually belled out from shaft diameter at the bottom), and increasing in diameter by 2 in. steps in each eight feet up to the elevation of the footing.

When machine excavation is practicable, a substantial saving in time can be effected with consequent economy.

The economy of this type of caisson is due to reuse, and salvage, of the cylinders which only temporarily line the excavation, and also to the lack of heavy equipment and overhead requirements.

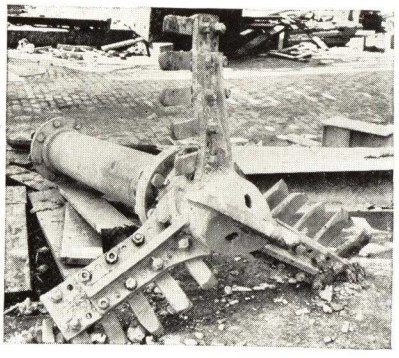
PNEUMATIC TYPE

Operations are carried on in this type under air pressures up to 48 lbs. per square inch, which requires air locks for entry and removal of workmen and materials and other costly and heavy equipment. This process makes for relatively slow progress and is seldom employed where any other method is possible.

WET PROCESS CAISSON

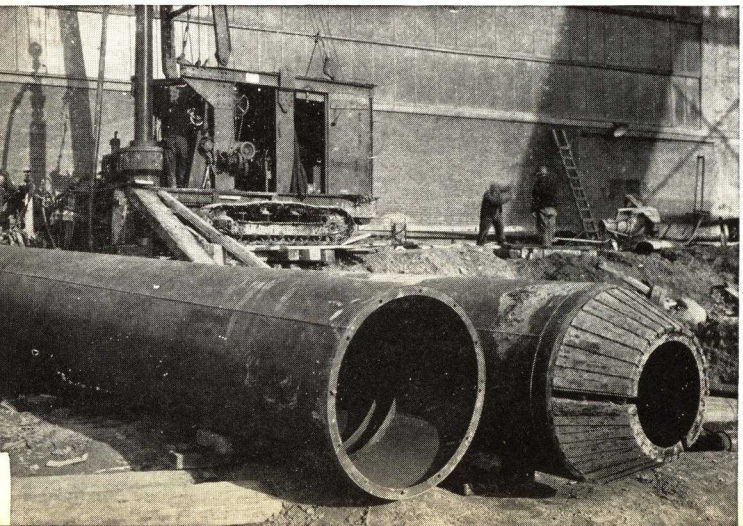
Wet Process Caissons are installed by a "spud drilling" process employing a specially designed spider-like drill member with radiating arms adjusted to the exact diameter of the caisson. This drill is rotated from the top and water usually mud laden under heavy pressure forced through its hollow stem, emerging at the point to assist in the cutting action. A portion of the material drilled rises to the top under the continuing pressure and over-flows into an adjacent sump.

When the final bearing strata has been reached, the spud drill is removed, and a steel cylinder lowered into the hole and driven to final seal. The fluid and residue remaining is then pumped out, the bottom cleaned and inspected, and the concrete poured in the ordinary manner. (In some instances the cylinder is withdrawn as soon as concrete is poured and is re-used.)

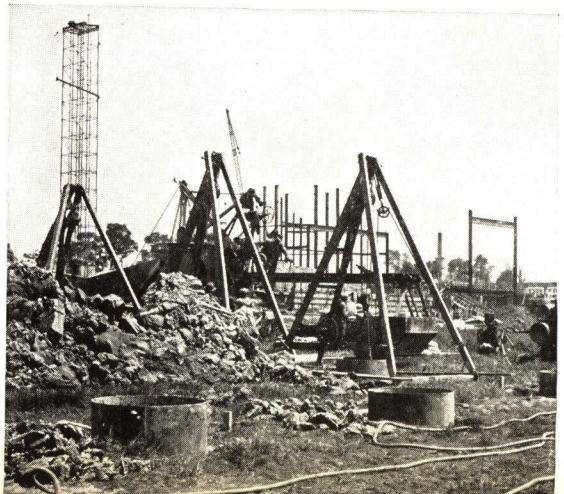


Right: SPUD DRILL used in WET PROCESS TYPE CAISSON — Note apertures for water emergence at point and attached section of drill pipe— also cutting teeth attached to drill arms.

Below: Cylinder Sections used in WET PROCESS TYPE CAISSON.



Below: Installation of GOW CAISSON PILES—Note 3 steel cylinders partially exposed in foreground.



SPECIAL CONCRETE WORK

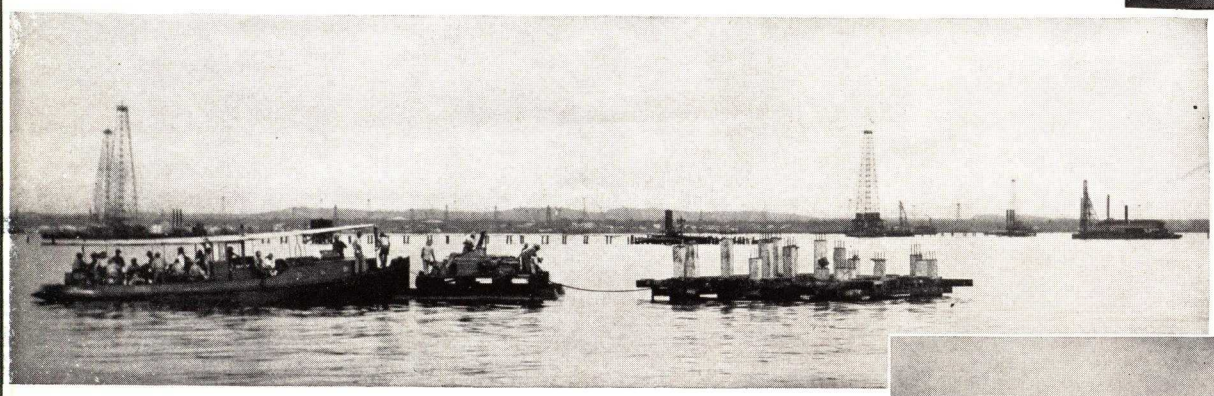
SHORE PROTECTION • JETTIES
BRIDGES • RETAINING WALLS
HYDRO-ELECTRIC PLANTS • DAMS
RIVER IMPROVEMENTS • PIERS
TUNNELS • TRESTLES

The illustrations appearing on this page serve to show partially the character of the Raymond Company's activities in other fields than foundation work. In many of these projects the Company's connection has been continuous from the stages of preliminary survey and reports, through the processes of planning and design, on to complete construction, and, in some instances, operation subsequent to completion.

Each project has produced its own problems, and each has required its special treatment. Each successive accomplishment has added to the experience and knowledge of the organization, and increased its ability to further serve the architectural and engineering professions.

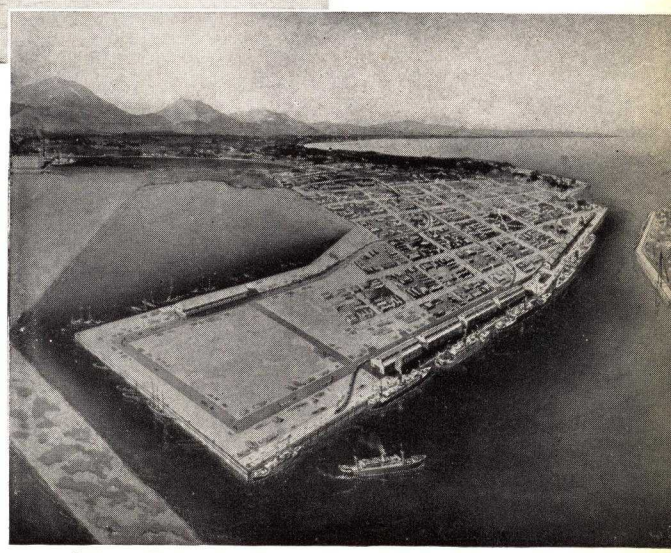
Above: Section during construction of five mile reinforced concrete sea wall on Lake Pontchartrain (La.). Supported on reinforced concrete bearing and batter piles and a cut-off wall of tongue and groove reinforced Raymond Concrete Sheet Piles.

Right: Sections of 34 in. diameter Reinforced Concrete Pipe used for 45,500 ft. supply line.



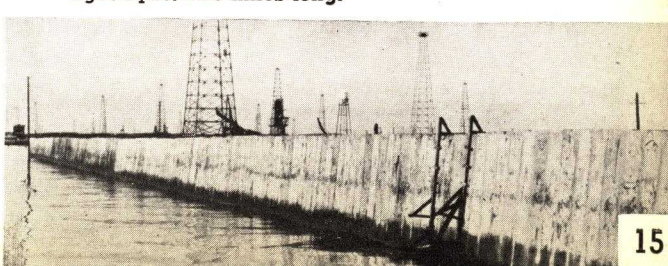
Left: One of a large number of oil well derrick bases for Lago Petroleum Company in Lake Maracaibo, Venezuela.

Right: Complete Harbor Development at Puerto Cabello, Venezuela —for Venezuelan Government.



Below: Boca Ciega Causeway near St. Petersburg, Florida—length 2800 ft., width 30 ft. This was one of three similar structures built by the Raymond Company under the same contract.

Below: Retaining the waters of Lake Maracaibo, Venezuela, S. A.—Reinforced concrete sheet pile watertight dyke, 2.73 miles long.



RAYMOND
CONCRETE PILES

FOUNDATIONS

UNDERPINNING

SPENCER, WHITE AND PRENTIS, INC.

ENGINEERS AND CONTRACTORS

LAZARUS WHITE, PRESIDENT
CHARLES B. SPENCER, VICE PRESIDENT
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PILES
SHAFTS
TUNNELS
FOUNDATIONS
UNDERPINNING
STEEL AND CONCRETE CONSTRUCTION

A LETTER TO ARCHITECTS, ENGINEERS & CONTRACTORS CONCERNING FOUNDATIONS & UNDERPINNING

Gentlemen:

In presenting this catalog to you, we take great pride in quoting the late William A. Starrett, one of the world's great builders, in his introduction to "UNDERPINNING", by Prentis and White.

"Foundations have ever been the concern of mankind in the erection of its permanent structures. No structure has ever survived the destruction of its foundations unless they were replaced or strengthened. Such of them as have survived through the ages have done so primarily because of their foundations. It is interesting to reflect that this all-important subject received little attention as a science until the beginning of the present generation; men still living and active in engineering may be counted among the pioneers . . .

"Perhaps no group has done more to bring this refractory and baffling subject under scientific discipline than Charles B. Spencer, Edmund A. Prentis and Lazarus White. Skillful engineers that they are, they have put their knowledge to the most practical of tests by actually undertaking the projects then desired and contracting for their successful completion.

"Spencer, White and Prentis is a firm name that must be included in any category of the leaders in scientific design and construction of difficult foundations of our time. Their sound engineering knowledge is coupled with a practical ingenuity that commands the admiration of engineers everywhere."

If your problem is as special as reinforcing an existing foundation or as general as a subway, irrespective of the amount involved, you have the experience of a thousand installations at your service.

Yours very truly
SPENCER, WHITE & PRENTIS, INC.
By: Charles B. Spencer
Vice-President

	Page
TUBA STEEL CYLINDER FOUNDATIONS	3-4-5
PRETEST UNDERPINNING	6
PRETEST FOUNDATIONS	8
PRETEST SOIL EVALUATION	8
CAISSON FOUNDATIONS	9
FOUNDATIONS UNDER EXISTING BUILDINGS	9
PRETEST METHOD APPLIED TO OTHER THAN FOUNDATION CONSTRUCTION	10
MASS CONCRETE CONSTRUCTION	11
N. Y. CITY BUILDING CODE	12-13

SPENCER, WHITE & PRENTIS, INC., are prepared to consult with architects, engineers and owners on their foundation and underpinning problems, to submit designs, and to install foundations, underpinning, and mass concrete construction.

TUBA STEEL CYLINDER FOUNDATIONS

CONCRETE FILLED STEEL TUBES—DRIVEN TO ROCK

Tuba Steel Cylinder Foundations are composed of groups of concrete filled steel cylinders. Each cylinder consists of sections of lap-welded or seamless steel tubing driven to rock, excavated, filled with concrete, and cut off at the required elevation.

The tubing is driven through the overlying material to rock by means of steam or pneumatic hammers. Standard lengths of tubing are approximately twenty feet, and where the depth of rock necessitates the use of more than one length, the sections are joined together by tight fitting internal sleeve couplings.

A group of cylinders is installed for the support of each column or concentration of loading; or they may be uniformly spaced under a bearing wall.

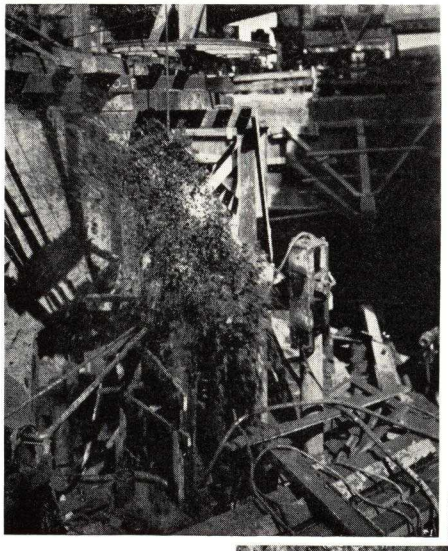
INSTALLING Tuba Steel Cylinders for large department store at Newark, New Jersey

SAFETY

Tuba Steel Cylinders are concrete steel columns bearing on rock. The carrying capacity of the cylinders is derived almost entirely from end bearing, and not from "skin-friction". They are not therefore dependent upon the quality of overlying strata nor are they affected by future adjoining operations.

Tuba Steel Cylinder Foundations are universally accepted as the equivalent in every respect of the usual open or pneumatic caissons.

Over a period of many years, many loading tests of Tuba Steel Cylinders have been made. No appreciable settlements have ever been obtained, even though these tests were performed with loadings greatly in excess of those for which the cylinders are designed, and were invariably made on the empty shell before filling with concrete.



EXCAVATING Tuba Steel Cylinders by means of compressed air

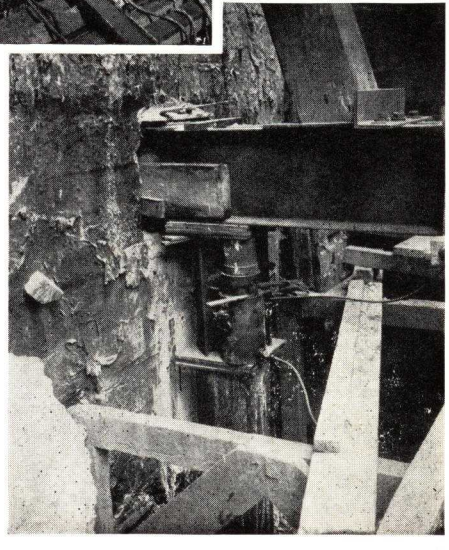
SPEED

For depths of twenty to thirty feet, Tuba Steel Cylinders afford a time saving over open caissons of approximately fifty per cent. For greater depths and adverse soil conditions the time saving is still greater.

ECONOMY

Generally, Tuba Steel Cylinders can be installed at much lower cost than piers to rock. For great depths and water conditions, the saving is considerable. As Tuba Steel Cylinders can be driven close to adjacent structures, they eliminate the costly cantilever construction of exterior columns inherent to other types of foundations.

In the case of open piers, an extra depth of a few feet may as much as double the cost of the pier. The same extra depth in the case of a Tuba Steel Cylinder pier will increase the cost only in proportion to the depth, and in some cases even less. The use of Tuba Steel Cylinder Foundations may, therefore, be regarded as insurance against greatly increased cost due to inaccurate or insufficient information as to the depth of rock.



TEST of Tuba Steel Cylinder using adjoining wall as reaction

TUBA STEEL CYLINDER FOUNDATIONS

TECHNICAL DATA, PERFORMANCE, INSTALLATION

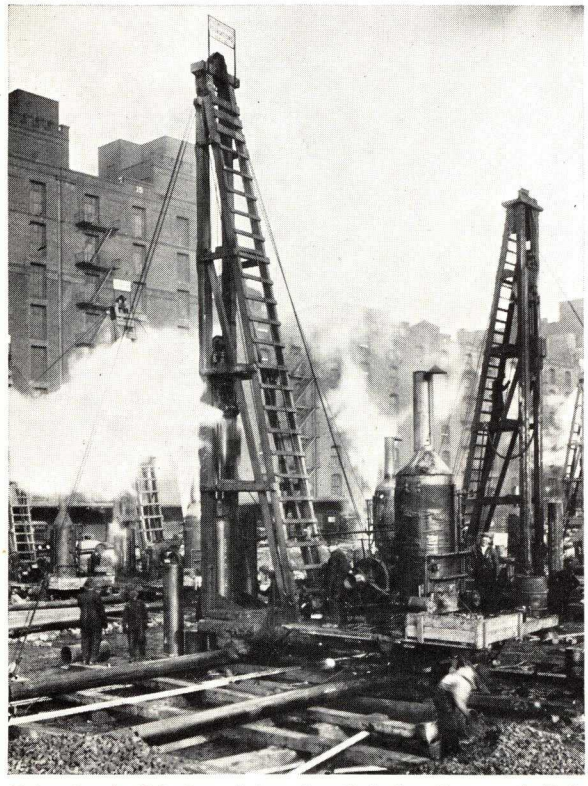
DIAMETERS AND THICKNESS OF TUBES

Tuba Steel Cylinders are of steel tubing 10¾″ to 20″ outside diameter, $\frac{5}{16}$″ to ⅝″ thick.

METHOD OF DRIVING

Cylinders are driven in one of three ways. They may be placed upright in wood frames which serve as guides, and driven by hammers placed upon them by derricks or cranes. They may be driven in "leads", portable self-contained units comprising guides, hammer and hoisting engine. Or they may be driven in "swinging leads", in which the guides and hammer are suspended from the boom of a crane.

Hammers are actuated by steam or compressed air, and are of the single-acting or double-acting type. In the former the steam or air raises the striking part of the hammer and the latter falls through the action of gravity alone. In the double-acting hammer the steam or air raises the striking part and is introduced into the cylinder on the down stroke as well, supplementing the action of gravity.



Tuba Steel Cylinders being installed for Starrett Lehigh Building, N. Y. C. Cylinders driven to rock at depths as great as 155 ft. below grade

METHOD OF CLEANING

The material through which the cylinder is driven remains within the tube, and is removed to permit of inspection of the rock, and the filling of the tube with concrete. The material may be removed by hand tools or by the use of water or compressed air jets. The latter method is the most common, and consists of introducing within the cylinder a smaller pipe through the lower end of which compressed air is expelled. The air expands and rises rapidly, carrying with it the material within the cylinder. The smaller, or "blow" pipe is usually 2½ inches in diameter, and the air pressure employed varies between 85 and 100 pounds.

DESIGN

A group of Tuba Steel Cylinders is placed for the support of each concentration of loading. The size and number of cylinders in a group depend upon the load to be supported.

COMPUTATION OF LOADS

(See New York City Building Code, pages 12 and 13.)

Tuba Steel Cylinders are figured as unsupported columns. For convenience the old New York City Building Code provided a unit load of 500 pounds per square inch on the concrete, and 7500 pounds per square inch on the steel shell, the outside $\frac{1}{16}$″ being discounted for corrosion. In the present Code, the values so obtained are slightly modified so as to give figures more convenient for use.

CORROSION

The deduction of the outside $\frac{1}{16}$″ as stated above is to provide for possible loss of metal through rust or deterioration. Steel cylinders in the ground will rust to some extent, but the amount is negligible. The first rusting, or oxidation, produces iron oxide which permeates the ground immediately surrounding the cylinder to a distance of several inches. Ground so permeated, however, is impervious to water. Iron oxide, in fact, is the basis of a well known system of water-proofing, and is a base for paint used on metals to prevent corrosion. The first rusting creates a protective coating which prevents further deterioration of the metal. This has been proven by exposing cylinders which have been in the ground for over twenty-five years, carefully cleaning and calipering them. In no case has any cylinder shown a loss of more than $\frac{1}{64}$″ of metal.

EFFECT OF TUBA STEEL CYLINDERS ON ADJOINING BUILDINGS

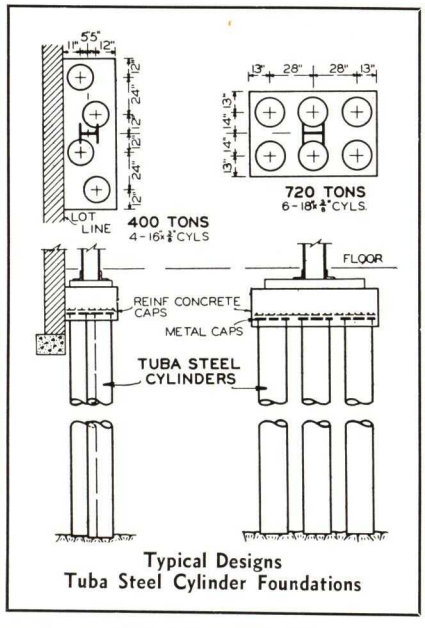
Due to uniform section, smooth surface, and the fact that no material is displaced, vibration is reduced to an absolute minimum. The underpinning and shoring of adjoining buildings necessitated by the use of open piers for exterior columns may be entirely eliminated by the use of Tuba Steel Cylinders. The vibration caused by the driving of such cylinders is less than that resulting from the driving of sheeting for open piers, and far less than for any other type of pile.

FLEXIBILITY

There is no limit to the length of Tuba Steel Cylinders, as is the case of concrete piles. They have been driven to depths as great as 155 feet. Tuba Steel Cylinders can be installed inside of existing buildings, and in limited headroom conditions where other types of foundations cannot be used. For such installations shorter sections of tubing are used, and connected together by internal sleeve couplings. Numerous machinery foundations have been so installed, and under similar conditions Tuba Steel Cylinders have been driven to depths as great as 90 feet for the support of floors in manufacturing buildings.

WHEN NOT DRIVEN TO ROCK

Desirable as it is to carry foundations to rock, it is often the case that the depth to rock is so great as to render rock bearing piles impracticable. In such cases, piles similar to the above may be driven into a stratum of sand, gravel or other firm bearing material. Such piles are driven with their ends closed by means of cast steel or cast iron points. The shell is filled with concrete and the resulting pile, though ordinarily figured at the usual concrete pile load of 30 tons, has many advantages over ordinary concrete piles. Their carrying capacity is derived almost entirely from end-bearing so that they are not affected by movements in the upper strata, nor by adjoining operations in the future. The use of the heavy steel shells which are left in place permits penetration through heavy obstructions and provides a factor of safety not present in other types of piling.



Typical Designs
Tuba Steel Cylinder Foundations

INSTALLING Tuba Steel Cylinders inside of building for support of new floor, American Brass Co., Hastings, N. Y.

PARTIAL LIST OF STRUCTURES SUPPORTED ON TUBA STEEL CYLINDERS

More than five hundred structures throughout this country, from two to forty-five stories in height, are supported on Tuba Steel Cylinders. Some of these are listed below:

Wall & Hanover Building, New York City, N. Y.
Starrett Lehigh Building, New York City, N. Y.
19 Rector St., New York City, N. Y.
12 Sub-stations—N. Y. Edison Co., New York City, N. Y.
N. Y. Steam Corp., New York City, N. Y.
F&M Schaefer Brewing Co., Brooklyn, N. Y.
Dime Savings Bank, Brooklyn, N. Y.
E. R. Squibb & Sons, Brooklyn, N. Y.
Gordon Baking Co., Long Island City, N. Y.
Yonkers Telephone Co., Yonkers, N. Y.
Universal Atlas Cement Co., Hudson, N. Y.
Ricketts Laboratory, R.P.I., Troy, N. Y.
Brockport Central High School, Brockport, N. Y.
Stamford Gas & Electric Co., Stamford, Conn.
D. M. Read Department Store, Bridgeport, Conn.
National Newark & Essex Building, Newark, N. J.
Salaam Temple, Newark, N. J.
Industrial Trust Co., Providence, R. I.
First National Bank Bldg., Tampa, Florida
Peninsular Telephone Bldg., Tampa, Florida

SECTION OF THE NEW YORK CITY BUILDING CODE—Covering Requirements for Concrete Filled Steel Piles—WILL BE FOUND ON PAGES 12-13

PRETEST UNDERPINNING

Pretest Underpinning is the highest development of the underpinning art, and is based upon recently established principles of Soil Mechanics. As it alone employs these principles, it is the system of underpinning which reduces settlement to an absolute minimum.

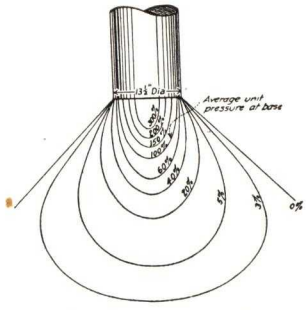
Pretest Underpinning is employed to provide new and deeper foundations for existing structures; to arrest the settlement of structures whose foundations have proven inadequate; and to increase the capacity of existing foundations to which loads are to be added. Pretest Underpinning is applicable to every type of structure and to nearly every ground condition. It entails the least interference with full use of the structure, and the least obstruction to adjoining property and streets during installation.

PRINCIPLES UNDERLYING THE PRETEST METHOD

When jacked down under a test load, an underpinning cylinder (or other footing) builds up beneath it a resistance which prevents further penetration. Investigations have shown that this resistance is created by the interlocking and compacting of the grains of the bearing material. This distribution of pressure takes the form of the so-called "Bulb of Pressure".

As long as the load is maintained on the cylinder, the "Bulb of Pressure" is maintained. If the load is released, however, the "bulb" is partly, if not wholly destroyed. If the load is reapplied, and the cylinder again forced down, an equivalent "bulb" or resistance will again be created, but at some depth below that at which the original bulb occurred. That is, the cylinder must be forced to some greater depth in order to re-compact the material sufficiently to obtain the original carrying capacity. Results of repeated tests confirm that rebound follows each release of load, and that equal resistance under reloading is found only at greater depth.

If the jacks are removed after the cylinder has been tested to the required loading, rebound will occur. It is not possible through the medium of a wedging beam and steel wedges to re-apply to the cylinder the test load. This can only be obtained when the cylinder has penetrated to some depth greater than that at which it was originally tested. As such penetration is caused by the load of the structure being applied to the cylinder by the wedging beam, it must be accompanied by a settlement of the structure equal in amount to that of the additional penetration required.



Distribution of pressure through soil beneath a footing as determined experimentally — known as the "Bulb of Pressure."

THE PRETEST METHOD

Sectional steel cylinders are jacked down beneath the foundations of a structure to a satisfactory bearing material, after which they are cleaned out, and filled with concrete. Each cylinder is then tested to an overload capacity, usually 50% in excess of the permanent load. While the full test pressure is maintained on the jacks, a short steel column is placed on top of the cylinder, and the load of the footing is permanently transferred to the underpinning cylinder by means of steel wedges. The cylinder is prevented from rebounding and destroying the "Bulb of Pressure" which has been created beneath it.

The essential difference between Pretest Underpinning and other methods is that in Pretest Underpinning the transfer of the load from the foundation to the underpinning cylinder is done with the full test load maintained on the cylinder by the jacks. There is no release of load while the wedging is being done. This method of transferring the load is the Pretest feature which eliminates the damaging settlement inherent to other methods.

GROUP TESTING (PATENTED)

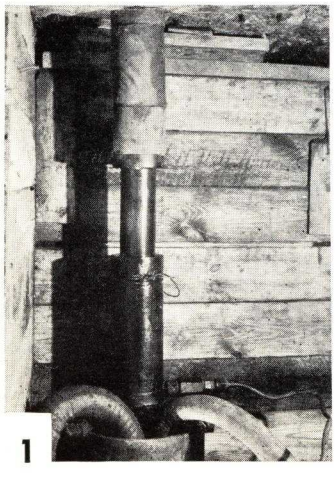
When Pretest Cylinders are, of necessity, installed so close together that their "Bulbs-of-Pressure" overlap, it is customary to test and wedge them in groups in addition to testing them singly. This Group Testing removes the possibility of overloading the cylinders and of releasing a portion of the load on any cylinder by subsequent installation of an adjacent one.

1 Jacking a sectional steel cylinder in a pit beneath a foundation. In this case a water jet and a pump suction remove the material from within the cylinder.

2 Testing the bearing capacity of a cylinder after it has been jacked to firm bearing, excavated, and filled with concrete.

3 With the full test pressure maintained on the jacks, a steel "wedging-beam" is inserted, and steel wedges driven between the beam and the steel plate under the foundation.

4 The jacks are removed, leaving a completed Pretest Cylinder.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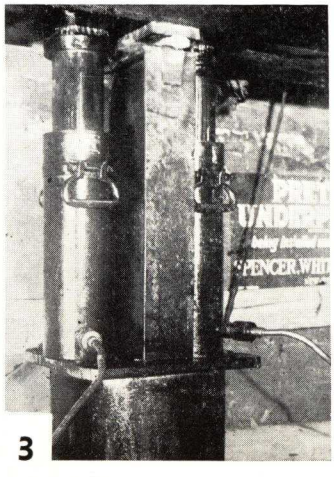
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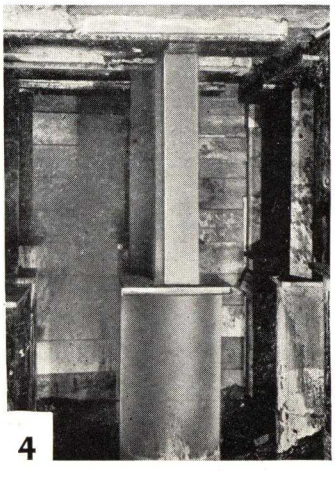
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PRETESTING SPREAD FOOTINGS

The Pretest principle is also employed to increase the carrying capacity of spread footings. It is the most economical method of arresting the settlement of structures whose spread footings have proven inadequate, and of providing for increased loadings on footings which already carry full loads.

In order to Pretest a spread footing, the wall or column which it supports is needled, and hydraulic jacks are set between the needles and the footing. If the footing supports a wall, the needles consist of beams placed through the wall; if the footing supports a steel column, the needles consist of structural steel brackets bolted or riveted to the column section.

With the wall or column above serving as a reaction, the footing is jacked down until there is obtained a resistance sufficient to support the permanent load. If the necessary reaction can be obtained without damage to the structure, it is customary to jack to a loading in excess of the permanent load. The jacking pressure is maintained for a sufficient time to insure against further depression of the footing. While the full test pressure is maintained on the jacks, steel wedges and shims are driven between the base of the wall or column, and the footing, by the Pretest Method. It is essential that the wedging between the footing and the load it supports be done by the Pretest Method. Only by this method is the "bulb-of-pressure" maintained, and the success of the operation assured.

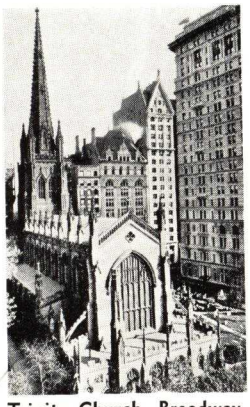
When the footings occupy almost the entire area of the site, or are at water level, the conditions may be such that Pretesting the spread footings themselves is not sufficient. In such cases it is possible to secure greater bearing capacity by a combination of Pretest Underpinning and Pretesting of the footings. The practice then is to install permanent needles, riveted to steel columns or passed through walls; beneath these needles underpinning cylinders are placed in sufficient numbers to provide the additional carrying capacity, and tested and wedged by the Pretest Method; the spread footings are then Pretested in the usual manner.

In some instances such as where boulder fill deposited in soft ground, or similar conditions make spread footings the only economical foundations, but with the probability of unequal settlements, the foundations are designed in advance for future Pretesting. Brackets are provided on columns, or niches are left in concrete walls for the installation of beams, so that they can be needled at minimum cost. Where settlement occurs, the footings are jacked down against the needles, and wedged by the Pretest Method. This construction has proven to be very economical, and has saved considerable time in construction.

INSTALLATIONS

Pretest underpinning has been installed under hundreds of structures, including buildings up to 28 stories in height, bridge piers, retaining walls, chimneys, elevated railway columns, etc. Single column loads have run as high as 1300 tons. Bearing materials have included sand and clay mixtures, sand, gravel, hardpan and rock. In some cases cylinders have penetrated to depths as great as 90 feet. They have frequently penetrated through quicksand and other unstable materials, and in most cases through water bearing ground.

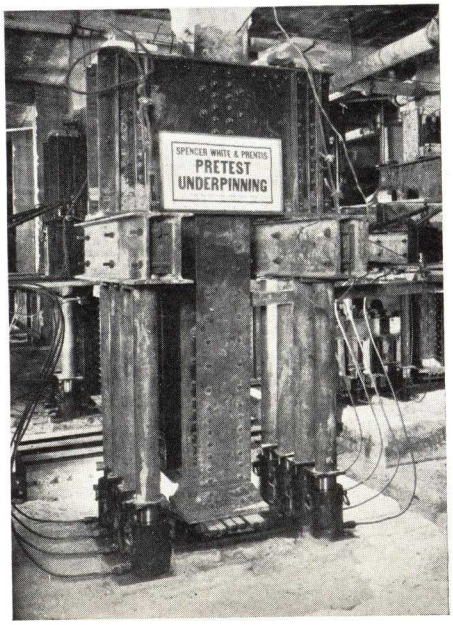
U. S. Sub-Treasury Building, Wall St., N. Y. C.



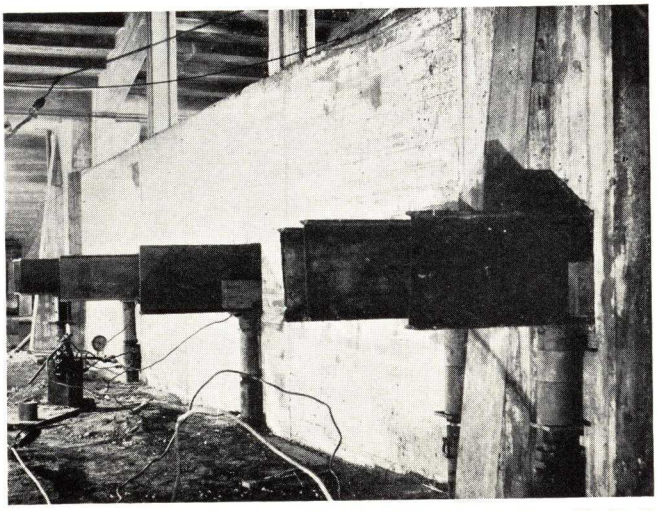
Trinity Church, Broadway, N. Y. C.

UNDERPINNING OF STRUCTURES ON WOOD PILES

Settlements of structures founded on wood piles are usually due to (1) Deterioration of the upper portions of the piles due to a recession of the permanent ground water level, (2) Reduction of the cross-sectional area of the piles due to the action of marine borers, (3) Failure to drive piles to a proper penetration when originally installed. For the first condition



Pretesting a spread footing under a column loading of 400 tons



Pretesting spread footing beneath wall of Yankee Stadium, N. Y. C.

stated above the pile is cut off at the permanent ground water level or a short distance below same, Pretested against the footing above, and the upper portion replaced by a steel I beam section.

For the second condition the affected portion of the pile is removed, and the pile Pretested and finished as above. For the third condition, the top of the pile is removed for a length sufficient to permit the installation of the jacks, and the pile driven hydraulically by using the footing above as a reaction; when proper penetration has been obtained the top of the pile is replaced by a steel I beam section Pretested in place.

Installations of this type:

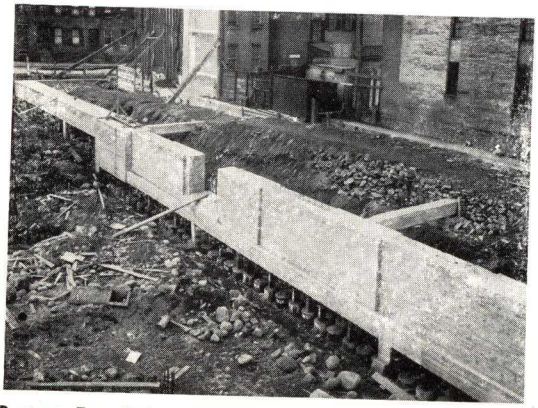
Jackson Laboratory, E. I. du Pont de Nemours & Co., Deep Water Point, N. J.
Beards Erie Basin, Brooklyn, N. Y.

PRETEST FOUNDATIONS

First developed for underpinning, the Pretest principle has been adapted to the construction of new foundations. Where ground conditions are suitable, Pretest Foundations will result in a saving in both cost and time.

Pretest Foundations are installed by setting up short sections of cylinders in pits or trenches at the locations of the designed foundations. The cylinders are concreted and temporary short wood posts placed upon them. Concrete footings are then constructed, bearing on the blocking and on the earth at either side of the pits. The erection of the building is then begun.

Installing Pretest Foundations



Pretest Foundation, American News Building, N. Y. C.

When the erection of the building has proceeded to a height sufficient to provide a reaction equal to the designed load on a single cylinder, one of the cylinders in each group is jacked to firm bearing, tested, and permanently wedged against the footing.

As additional building load is applied Pretesting keeps pace with erection, until at completion the building is supported on a foundation, each unit of which has been tested to an overload capacity.

One of the distinct advantages of Pretest Foundations over foundations of other types is in the saving in time effected. The erection of the building itself begins practically at the same time as that of the foundations, thus saving the time usually spent in foundation work. Another advantage of this system is the fact that every unit of the foundation is actually tested for the load it is designed to support, a condition that obtains in no other type of foundation. Since the carrying capacity of each cylinder is demonstrated by actual test, the cylinders are forced down only to the depth required to secure the necessary support, instead of being driven to a predetermined depth which may be greater or less than that actually required.

Pretest Foundations are the only foundations in which every unit is completely tested before being used to support the structure. Spread footing and friction pile foundations are designed on the assumption that the material throughout the site is of uniform bearing value, and this bearing value is usually assumed arbitrarily. In Pretest Foundations whatever the assumption as to soil values, the cylinders will penetrate to whatever depth may be required to secure the test load.

Pretest Foundations have the full approval of the building departments of New York and other prominent cities, as well as that of leading engineers and architects.

Some notable Pretest Foundations:

Office Building (22 stories) 110 William St., New York City.
Hide & Leather Building (18 stories) Gold & Frankfort Sts., New York City.
N. Y. Edison Company Station, East 6th St., New York City.
American News Co. (12 stories) Varick St., New York City.

PRETEST SOIL EVALUATION

A Pretest Soil Evaluation is the most accurate and economical means of determining the bearing value of a soil. A reaction is obtained, whenever possible, under an existing wall, or under beams placed between footings, walls or columns of an existing adjacent structure. When this cannot be done, reaction is obtained against the sides of a sheeted pit or trench, or a loaded platform. A steel plate of the required area placed beneath concrete or wood blocking is forced down by hydraulic jacks against this reaction.

By applying successively increasing loads and noting the settlement at each increment, a settlement curve can be plotted; this curve will indicate clearly the supporting power of the soil. By the use of a power pump and hydraulic accumulator an absolutely uniform pressure can be maintained for as long a period of time as desired. Tests have been run for several weeks with continuing settlement.

At any time a desired loading can be maintained for 24 or 48 hours longer by wedging between the tests blocks and the reaction. Such wedging is performed by the Pretest Method.

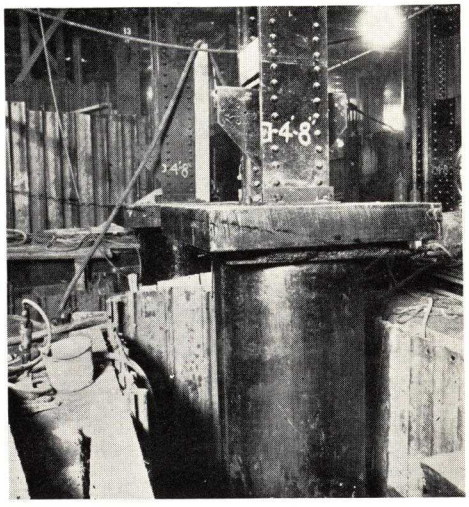
In a Pretest Soil Evaluation the loads are known exactly, successively increasing loads can be applied in a few minutes, the complete test performed in the presence of all interested parties in a short time, and any specified load can be left in place for any desired period of time at very low cost.

CAISSON FOUNDATIONS

Spencer, White & Prentis and affiliated companies have installed many caisson foundations, including one of the deepest building foundations in the world, and are equipped to do both pneumatic and open caisson work.

These companies have developed improved methods for installing caisson foundations, resulting in reductions in both cost and time required for installation. Under many conditions these newer methods permit the use of open caissons in place of the more expensive pneumatic type.

Some of the caisson foundations installed are:
Central Savings Bank, New York City
21 West Street Building, New York City
American Radiator Co., New York City
Gordon Baking Co., Long Island City, N. Y.
Fidelity Philadelphia Trust Co., Philadelphia, Pa.
Cleveland Union Terminal, Cleveland, Ohio
City Hall, Buffalo, N. Y.

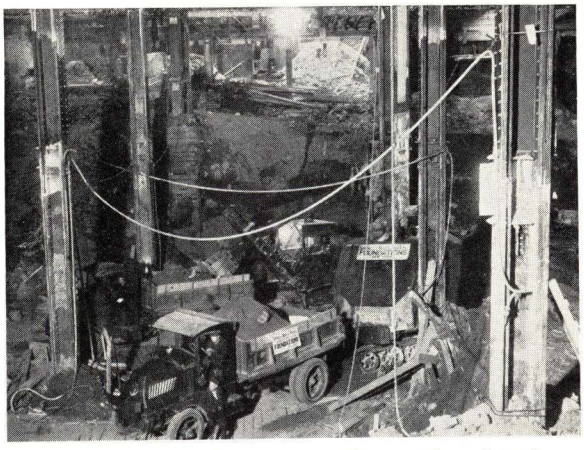


Column of 70 story Bank of Manhattan Building, N. Y. C., supported on 4 foot cylinder installed during demolition. Final pier under construction simultaneously with steel erection

FOUNDATIONS UNDER EXISTING BUILDINGS

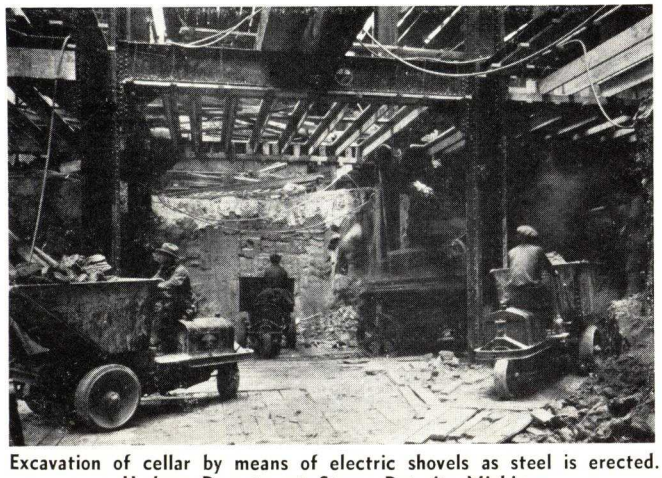
To save time in construction, Spencer, White & Prentis have developed methods for installing new building foundations prior to or during the demolition of existing buildings on the site. Time so saved has run from four to six months on large operations.

In the case of the Bank of Manhattan Building in New York City, foundations were installed during the demolition of an existing 13 story building. The three months saved in the foundations enabled the builder to complete the building within eleven months of the date of taking over the site. In the case of the Abraham & Straus Department Store, time restrictions were even more severe. Except at a heavy financial loss to the owner, the store could be abandoned only from January to October. The problem was solved by installing the piers one at a time working in partitioned off portions of the selling basement. The excavation of the forty foot cellar was carried on simultaneously with the erection of the new store.



Excavating for basement after erection of steel.
A. & S. Department Store, Brooklyn, N. Y.

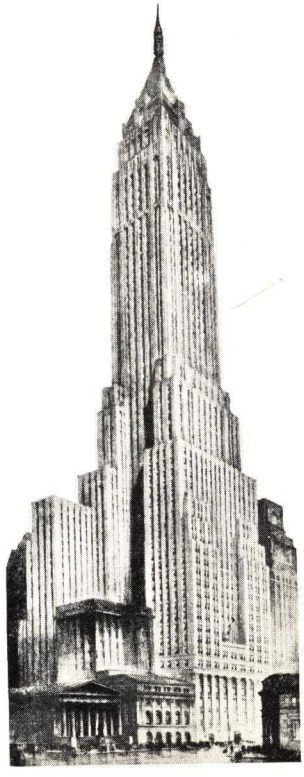
In many cases Tuba Steel Cylinders, caissons, Pretest Cylinders, or spread footings can be installed in the basements of the old buildings on the site. When necessary, due to lack of space or time, temporary footings sufficient in area to support only a part of the ultimate load are installed, and are increased in size later. Steel erection is started immediately upon completion of the demolition. After the steelwork is under way, the general excavation and incidental work are done, and the temporary foundations increased to their permanent size.



Excavation of cellar by means of electric shovels as steel is erected.
Hudson Department Store, Detroit, Michigan

Buildings where these methods were used include:

American Surety Co., New York City
Bank of Manhattan Building, New York City
Wanamaker Store, New York City
A. & S. Department Store, Brooklyn, New York
The J. L. Hudson Co., Detroit, Mich.



Caisson Foundations installed during demolition of old building, Bank of Manhattan Building, N. Y. C.

THE PRETEST METHOD APPLIED TO CONSTRUCTION OTHER THAN FOUNDATIONS

The scientific principles underlying the Pretest Method have been applied to features of construction other than foundations.

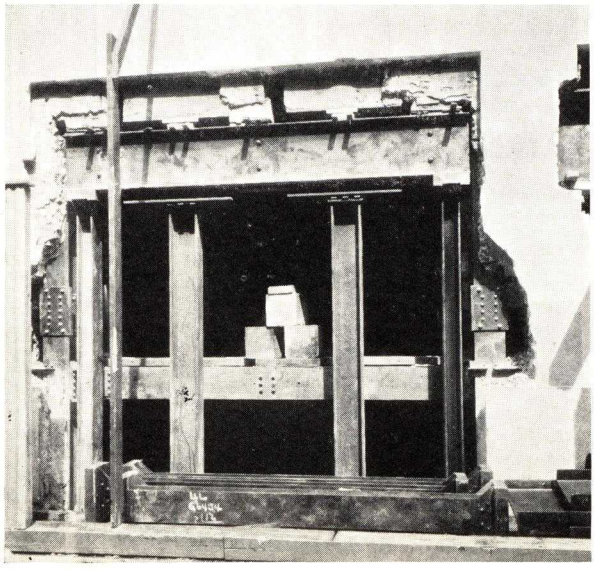
Structural steel members such as beams, girders, or columns, are often installed within an existing building in order to relieve other structural members of their loading, or to permit of their removal; beams and girders will deflect upon the transfer to them of such loading, and columns will be subject to shortening because of their elastic deformation under compression. Such deflection or shortening may result in serious cracking of the superstructure, unless the transfer of the loading is made while the new members are in a pre-stressed state. This is accomplished by the Pretest Method.

Deflecting girders by the Pretest Method at Onondaga Savings Bank, Syracuse, N. Y. The lower brackets are attached to the girders, the upper brackets to the column, with the hydraulic equipment between

In the Onondaga Savings Bank, in Syracuse, N. Y., the construction of a banking room on the first floor necessitated the removal of the lower portions of several interior columns of the existing nine story building. It was planned to carry these columns above the second floor on girders spanning between adjacent columns on either side. The engineers figured that the transfer of these column loadings to the girders in an unstressed state would cause a deflection of ¾". All areas supported by these columns would settle accordingly, floors and walls would crack, and mechanical equipment would be seriously damaged. It was necessary therefore that each girder be deflected ¾" before the transfer of the load. Brackets were attached to the column, and by jacking between the girder and these brackets, the proper deflection was applied and held by the Pretest Method until the connection between the column and the girder was completed.

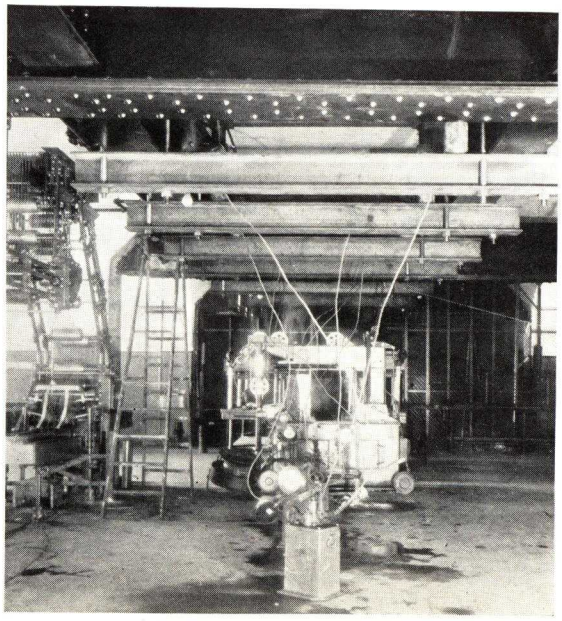
The alteration of the twelve story apartment at 400 Park Ave., New York City, to provide ground floor stores, required the development of an original method of shoring. Two conditions seriously complicated this problem; the building walls are self-supporting, 24" thick at the first floor, faced with limestone, and carry a load of twelve tons per linear foot at street level; secondly, the New York Central Railroad cut under Park Ave. is only two feet from the face of the building in which the store fronts were to be placed, and no loading from shores could be placed upon the roof over it. All supports and shores had to be confined within the limits of the wall itself. The special method of performing this work as devised by the engineers of Spencer, White & Prentis proved successful, and the new steel frame work installed and Pretested without a crack developing in the structure.

The printing plant of the News Syndicate, in Brooklyn, N. Y., is an extremely heavy structure of reinforced concrete. The flat slab of the second floor is 24" thick, and serves to support printing presses. The presses originally installed were removed after being in operation



Left:

Installation of store fronts by original shoring method, at 400 Park Avenue, N. Y. C. The two center columns shown are temporary.



Right:

Pretesting steel beams and girders, News Syndicate Building, Brooklyn, N. Y. C.

several years, and replaced by more modern and much heavier units. The floor slab was deemed incapable of supporting the new loadings, and it was decided to support the new presses on a system of structural steel beams and girders immediately beneath the second floor slab, the slab itself serving merely as a medium to transmit the loads of the presses to the new steel system below. The normal deflection of the steel would have damaged the delicate machinery so that prestressing of the steel was necessary. This transfer of loading was successfully accomplished by Pretesting the beams and girders as the new presses were erected; the actual stresses in these members were verified by strain gauges.

An investigation of the conditions of the Stratford Avenue Bridge, in Bridgeport, Conn., disclosed the fact that deterioration of certain of the truss members was such as to warrant the immediate closing of the structure to traffic. The end posts had suffered the greatest deterioration and had to be reinforced by adding to them additional structural members. The existing members being under compression, it was necessary to produce in the sections to be added an equivalent compressive stress before the connection was made. This was done by the use of hydraulic equipment, and the new sections Pretested before the welding of same to the original members.

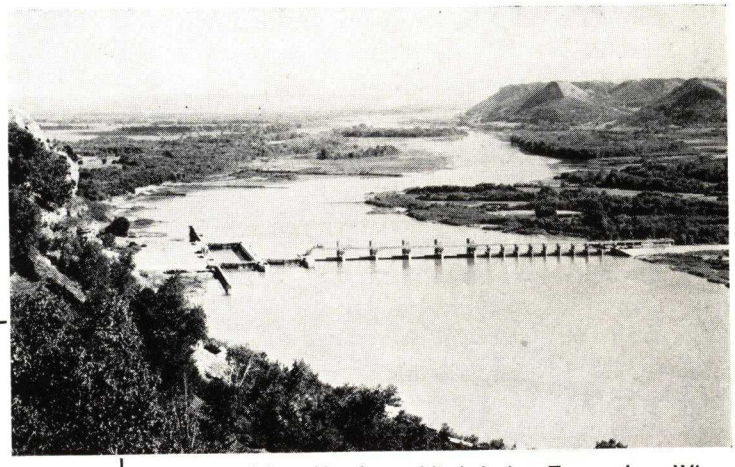
PRETEST REINFORCEMENT OF RETAINING WALLS

Where lateral support is required as well as additional carrying capacity, inclined PRETEST CYLINDERS are installed. The illustration on the back cover is of a retaining wall at Douglaston, Long Island, so supported. The wall moved laterally, bulged approximately one foot, and cracked. The condition of the wall precluded any work beneath same, and as lateral stability was of greater moment than vertical support, the PRETEST CYLINDERS were placed as shown. The concrete grillage shown reinforced the wall, and served to carry same between the points of support.

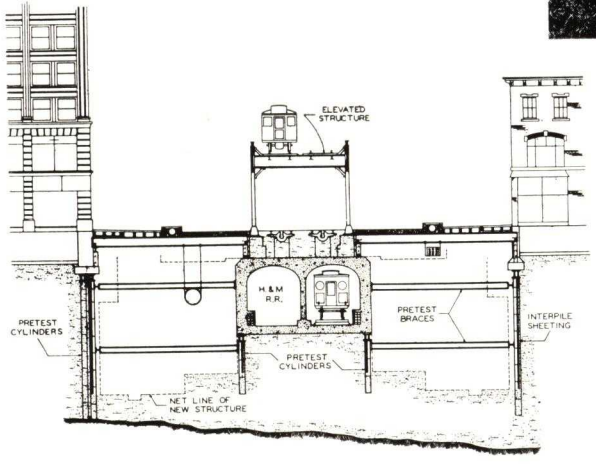
The successful solution of unusual and difficult problems is assured by our extensive experience in this class of work, the application of scientific principles, and the personal attention given by the members of this corporation to every job, large or small.

MASS CONCRETE CONSTRUCTION

SPENCER, WHITE & PRENTIS, INC., are organized and equipped to install heavy concrete structures such as bridge piers, locks and dams, viaducts, retaining walls, etc. Recent installations on the Mississippi River include Lock and Dam No. 6, at Trempealeau, Wisconsin, and Lock No. 3 at Red Wing, Minnesota, for the Corps of Engineers, U. S. Army.



Lock and Dam No. 6 over Mississippi at Trempealeau, Wis.



This corporation is at present constructing a section of the new Sixth Avenue subway from 8th to 18th Streets, New York City, a work of outstanding difficulty. A typical cross-section of this subway section is shown at the left.

8. 3. 2. 6. CONCRETE FILLED STEEL PILES

(8. 3. 2. 6. 1). § C26—410.0 General Requirements for concrete filled steel piles.—

1. Piles consisting of concrete filled steel tubes shall have a minimum inside diameter of 10 inches and a shell thickness of at least $\frac{3}{8}$ of an inch, except that 10 and 12 inch piles may have a shell thickness of $\frac{5}{16}$ of an inch. The concrete filling shall be at least equal to average concrete as specified in section C26—365.0. The ends of each tube shall be perpendicular to the axis of such tube, and all bearing surfaces shall be smooth and true-cut by an approved method. Splices shall be of such material and design as to insure a good alignment of the tubes. If splices below the upper splice are closer to each other than 20 feet, a 5 per cent reduction in load values shall be made for each additional splice used.

2. Where the borings indicate that piles will be less than 60 feet in length, the minimum designed outside diameter of the tube shall be at least 1/40 of the length. If such piles, as actually driven, exceed 40 diameters in length, a one per cent reduction in load shall be made for each diameter of excess length. Where borings indicate that the piles will be 60 or more feet in length, the minimum diameter shall be 18 inches and the minimum shell thickness shall be $\frac{1}{2}$ of an inch, and any reduction from the allowable loading for the slenderness ratio may be omitted.

3. The inside of the tube shall, after driving and before the placing of the concrete filling, be cleaned of any foreign matter. When tubes exceed 50 diameters in length, the concrete in the tube below the upper 50 diameters shall be deposited with a tremie or fully lowered bottom-dump bucket. It shall be unlawful to place the concrete filling through water, unless the superintendent specifically consents in writing to such placing, after the submission to him of the detailed method of procedure.

(8. 3. 2. 6. 2). b. Concrete filled steel piles driven to rock.—

1. When concrete filled steel piles are driven open-ended to refusal on bed rock, the following maximum loads per pile may be used:

10-inch inside diam. pipe.....55 tons	16-inch outside diam. pipe....100 tons
12-inch inside diam. pipe.....70 tons	18-inch outside diam. pipe....120 tons
14-inch outside diam. pipe.....80 tons	20-inch outside diam. pipe....140 tons
15-inch outside diam. pipe.....90 tons	22-inch outside diam. pipe....150 tons

2. The above unit values are based on the use of a shell having a thickness of $\frac{3}{8}$ of an inch. For each increase of $\frac{1}{16}$ of an inch in shell thickness, an increased capacity of 10 per cent of the base value may be used with a maximum increase in the specification of the above table of 20 per cent when piles are less than 60 feet in length and ten per cent when piles are 60 feet or over in length. A reduction of 10 per cent from the base value shall be made when $\frac{5}{16}$ inch shells are used. Piles 20 inches or more in diameter shall be filled with Class "B" concrete, in accordance with the requirements of section C26-365.0.

3. Concrete filled steel piles more than 22 inches in diameter shall be considered to be reinforced concrete piers, but the presumptive bearing capacity of the bed rock shall be limited to 60 tons per square foot of the gross area of the tube.

4. The center to center spacing of tubes when they are driven to bed rock shall be at least 2 feet and at least the diameter of the tube plus 10 inches.

(8. 3. 2. 6. 3). c. Concrete filled steel piles driven to hard pan.—When concrete filled steel piles are driven open-ended to refusal in cemented hard pan continuous to bed rock, the following maximum unit loads may be used; 70 per cent of the base value allowed in subdivision b of this section, with a maximum of 70 tons for any pile. Piles so used shall be spaced at least 30 inches from center to center.

(8. 3. 2. 6. 4). d. Concrete filled steel piles driven to boulders or a mixture of gravel and boulders.—When concrete filled steel piles are driven open-ended to refusal in boulders or a mixture of gravel and boulders with no softer material underlying, the following maximum unit loads may be used: 50 per cent of the base value allowed in subdivision b of this section, with a maximum of 50 tons for any pile. Piles so used shall be spaced at least 20 inches plus the diameter of the tube.

(8. 3. 2. 6. 6). e. Concrete filled steel piles driven open-ended to other materials, or driven with closed ends.—

1. When the bottoms of the piles are in or above any material of less sustaining power than that prescribed in subdivisions b, c and d of this section, or when piles are driven with closed ends, such piles shall be treated as piles cast-in-place as required by section C26—409.0, except that the minimum shell thickness shall be $\frac{5}{16}$ of an inch and the minimum outside diameter shall be $10\frac{3}{4}$ inches. Tubes may be driven with closed ends, or if such tubes are started open-ended, they shall be filled with concrete, the concrete shall be properly cured, and thereafter such tubes shall be driven to a sufficient depth to demonstrate the bearing capacity in accordance with the general requirements for concrete piles. The minimum spacing on centers shall be $2\frac{1}{2}$ feet.

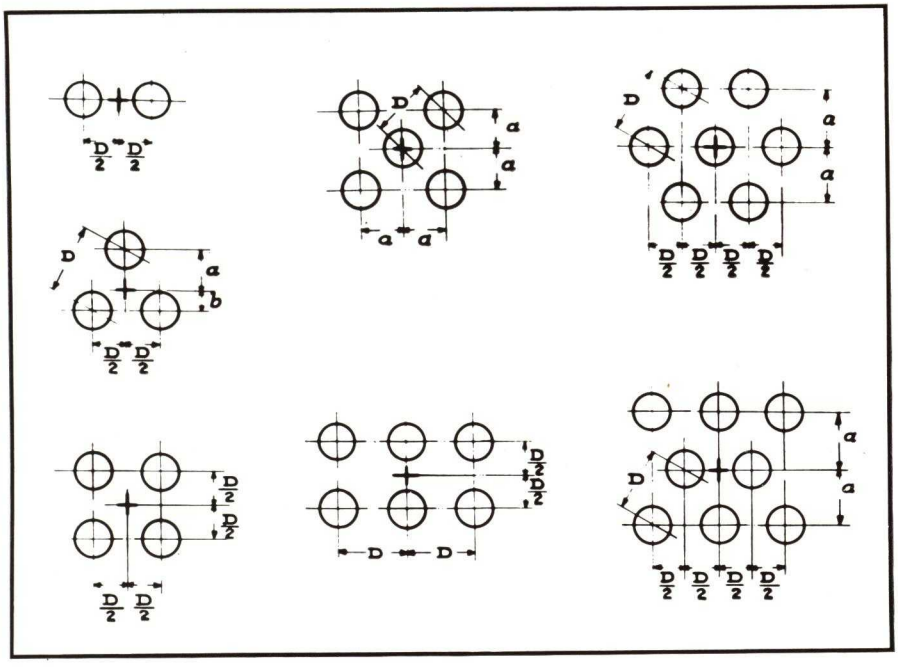
ALLOWABLE LOAD IN TONS, AND SPACING

Diam.	Wall Thickness	On Rock			On Hard Pan			On Boulders or Gravel and Boulders		
		Less than 60'	More than 60'	Spacing C. to C.	Less than 60'	More than 60'	Spacing C. to C.	Less than 60'	More than 60'	Spacing C. to C.
10¾"	5/16"	49.5	...	24"	34.7	...	30"	30.0	...	30"
	3/8	55.0	...	24	38.5	...	30	30.0	...	30
	7/16	60.5	...	24	42.4	...	30	30.3	...	30
	1/2	66.0	...	24	46.2	...	30	33.0	...	30
12¾	5/16	63.0	...	24	44.1	...	30	31.5	...	32
	3/8	70.0	...	24	49.0	...	30	35.0	...	32
	7/16	77.0	...	24	53.9	...	30	38.5	...	32
	1/2	84.0	...	24	58 8	...	30	42.0	...	32
14	3/8	80.0	...	24	56.0	...	30	40.0	...	34
	7/16	88.0	...	24	61.6	...	30	44 0	...	34
	1/2	96.0	...	24	67.2	...	30	48.0	...	34
15	3/8	90.0	...	25	63.0	...	30	45.0	...	35
	7/16	99.0	...	25	69.3	...	30	49.5	...	35
	1/2	108.0	...	25	70.0	...	30	50.0	...	35
16	3/8	100.0	...	26	70.0	...	30	50.0	...	36
	7/16	110.0	...	26	70.0	...	30	50.0	...	36
	1/2	120.0	...	26	70.0	...	30	50.0	...	36
18	3/8	120.0	...	28	70.0	...	30	50.0	...	38
	7/16	132.0	...	28	70.0	...	30	50.0	...	38
	1/2	144.0	132.0	28	70.0	70.0	30	50.0	50.0	38
	5/8	144.0	132.0	28	70.0	70.0	30	50.0	50.0	38
20	3/8	140.0	...	30	70.0	...	30	50.0	...	40
	7/16	154.0	.	30	70.0	.	30	50.0	...	40
	1/2	168.0	154.0	30	70.0	70.0	30	50 0	50.0	40
	5/8	168.0	154.0	30	70.0	70.0	30	50.0	50.0	40

GROUP PILE SPACING

Center to Center of Piles "D"	3-Pile Piers		5-Pile Piers	7- or 8-Pile Piers
	a	b	a	a
Inches	Inches	Inches	Inches	Inches
24	14	7	17	21
25	15	7½	18	22
26	15	7½	18½	22½
28	16	8	20	24½
30	17	8½	21½	26
32	19	9½	22½	28
34	20	10	24	29½
35	20	10	25	30½
36	21	10½	25½	31
38	22	11	27	33
40	23	11½	28½	35
42	24	12	30	36½
44	25½	13	31½	38½

SPACING FOR CONCRETE FILLED STEEL PILES



Spencer, White and Prentis Inc.

FOUNDATIONS & UNDERPINNING

OFFICES

SPENCER, WHITE & PRENTIS INC., 10 E. 40th ST., N.Y.C.

SPENCER & ROSS INC. . 2485 Scotten Ave., Detroit, Mich.

PRODUCTS & SERVICES

TUBA STEEL CYLINDERS • PRETEST UNDERPINNING • PRETEST FOUNDATIONS
CAISSON FOUNDATIONS • DIFFICULT SHORING • SOIL EVALUATIONS
MASS CONCRETE CONSTRUCTION

SECTION 2

CONTINUED ⟶

UNDERPINNING & FOUNDATION CO., INC.

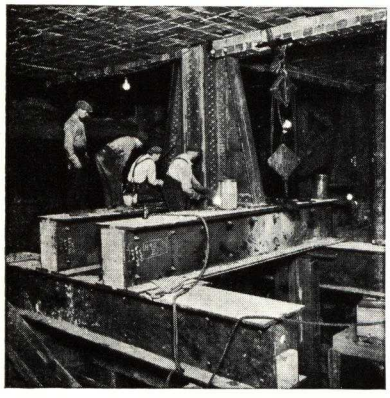
FOUNDED 1909

Foundation Engineers and Contractors

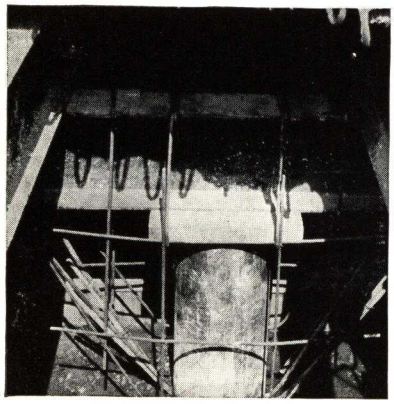
155 East 44th Street

NEW YORK, N. Y.

North Broad Street, Philadelphia
Buildings underpinned by this company during subway construction



Temporary Pick-up of a Heavy Column in a 13-story Building
The old footing was removed and a new footing installed at a new lower level to provide a deeper basement



Hercules Underpinning Pile Wedged in Place Beneath a Footing

PRODUCTS AND SERVICES

UNDERPINNING.
PILE FOUNDATIONS.
OPEN and PNEUMATIC CAISSONS.
SUBWAY and TUNNEL CONSTRUCTION.
DAMS, BRIDGES, etc.

We are qualified through wide experience in foundation work to handle large as well as small jobs of any kind. The services of our Engineering Department for consultation or preparation of designs and estimates are at your disposal. Trained men, and equipment of the most modern type, are instantly available for safe, rapid, economical construction.

UNDERPINNING

Underpinning may be necessitated by any of the following:

(a) Settlement of existing foundations. (b) Provision for additional capacity of existing foundations to accommodate new loads. (c) Influence of adjacent new excavation. (d) Lowering of basement level to provide useful space.

Various methods have been devised for underpinning work, among them HERCULES UNDERPINNING PILES (see below), extension of wall and column foundations by alternate pits with a minimum of shoring, needling of columns and walls, all of which this company has designed and installed.

HERCULES UNDERPINNING PILES

This type of construction, which has revolutionized underpinning work by its almost universal adaptability, was invented by officers of the UNDERPINNING & FOUNDATION CO., INC., more than forty years ago.

HERCULES UNDERPINNING PILES are tested cylindrical steel-and-concrete columns which transfer the load of a structure from the soil immediately beneath the footings to a deeper stratum of greater carrying capacity. They are constructed of sections of heavy steel pipe joined together by means of interior sleeve couplings and filled with concrete.

Method of Installation—At intervals beneath or beside the footings of the structure to be underpinned, pits are excavated to provide working space and headroom for the sinking process. The sections of the HERCULES UNDERPINNING PILE are sunk by means of a hydraulic ram, which thrusts against the underside of the footing or against temporary framing installed to distribute the jacking reaction to the superstructure or against artificially introduced loads. The interior of the cylinder is cleaned out at intervals by means of small orange peel buckets or other suitable tools. The pressure exerted on the pile by the ram is controlled at all times with a pressure gauge in the hydraulic line. Safe bearing capacity of the pile is proven by an overload test on the pipe. Upon completion of the test, the pile is filled with concrete and securely wedged to support the structural load. The exposed portion of the pipe and wedging steel are then encased in concrete and the remainder of the pit backfilled.

Advantages—Among the advantages of this system are the following:

(a) Avoidance of serious loss of ground beneath existing foundations, particularly in quicksand and other dangerous strata. (b) No vibration or noise is caused by the sinking process. (c) The carrying capacity of each pile is established by test. (d) Positive knowledge of the soil in which each pile rests. (e) Minimum interference with the normal operation of the structure being underpinned.

Typical Underpinning Work—This company has underpinned hundreds of structures from one to over twenty stories in height, including many miles of buildings along subway routes in New York, Brooklyn and Philadelphia.

Among buildings and other structures we have underpinned are:

14th Regiment Armory, Brooklyn, N. Y.
City Hall, Philadelphia, Pa.
Cameron Street Bridge, Harrisburg, Pa.
Gimbel Department Store, Pittsburgh, Pa.
Bell Tel. Co. of Pa., Pittsburgh, Pa
Navy Office Building, Washington, D. C.

HERCULES STEEL PILE FOUNDATIONS

The supremacy of HERCULES STEEL PILES has been proven by their repeated installations since 1895. Leading architects, engineers and contractors, recommend them for all types of buildings wherever bad subsoil conditions exist, or where rock is encountered at a depth greater than ten feet below grade and where heavy concentrated loads are to be carried.

HERCULES STEEL PILES consist of heavy steel-and-concrete cylinders supporting structural loads on bedrock without depending on the frictional value of the intermediate soil. They are usually installed in groups and are capped with reinforced concrete after the manner of ordinary piles. Diameter and thickness of cylinders are selected according to local conditions and loads to be carried, the ranges of sizes commonly used being given in the table herewith.

Installation—Tubes of standard length are driven open-end into the ground by means of a pneumatic or steam hammer of suitable size. Plumbness and accurate alignment are assured by heavy guides. Where penetration beyond a single length is required, the sections are joined by means of internal sleeve couplings. A compressed air pipe introduced into the cylinder cleans the interior down to the rock surface. After cleaning, the pile is filled with concrete and carefully cut off at the proper grade with an oxy-acetylene flame. The top of each pile is provided with a steel capping plate grouted in place to properly distribute the pile stress to the capping concrete, and each group of piles is then capped with reinforced concrete upon which the superstructure rests.

Stability—Numerous overload tests of HERCULES STEEL PILES driven to rock, demonstrate the ability of these cylinders to carry their designed loads without settlement.

The integrity of the many structures resting on HERCULES PILES driven through various subsoil strata attests the conservatism of their design.

Durability—Exposure of HERCULES STEEL PILES which have been buried ten to twenty years shows in some cases little, and in most cases no corrosion of the steel shell.

Where corrosion occurs it is merely a thin film which is prevented from scaling off by the surrounding earth and thus forms a protective coating.

Economy—HERCULES STEEL PILES are usually more economical than open or pneumatic caissons and, where rock is at a reasonable depth, cheaper than friction piles. Their great carrying capacity and adaptability to close grouping permit small concrete caps often no larger than caissons in area). Where required, HERCULES STEEL PILES may be driven within 2 in. of an adjoining wall to obtain concentricity of pile cluster and superimposed load, and thus eliminate expensive cantilever construction.

Safety—The extreme size and depth of exterior cantilever caps for friction piles frequently necessitates underpinning of adjoining structures which could be reduced, if not eliminated, by the use of HERCULES STEEL PILES.

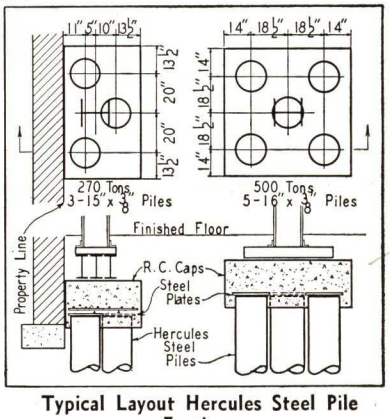
Since the steel cylinder is driven open-ended the displacement of soil is practically nil. This fact and the fewer number of HERCULES STEEL PILES require to carry a given load, reduce the notorious "pile-driving vibration" to a minimum.

Speed—Important savings in time of foundation construction are usually effected by the use of HERCULES STEEL PILES. We have installed the foundation for a 12-story building in two weeks and for heavier types of buildings in from four to six weeks.

Special Uses—An invaluable contribution to foundation installation is the adapability of HERCULES STEEL PILES to installation under limited headroom conditions. The sectional character of the shell and the flexibility of the driving equipment simplify the problem of foundations within existing buildings, under overhead wires, viaducts, etc.

A list of typical HERCULES STEEL PILE *Foundations will be furnished on request.*

Driving Hercules Steel Piles for the Benjamin Franklin Memorial in Philadelphia



Typical Layout Hercules Steel Pile Footings

Showing small caps and elimination of expensive underpinning and cantilevers

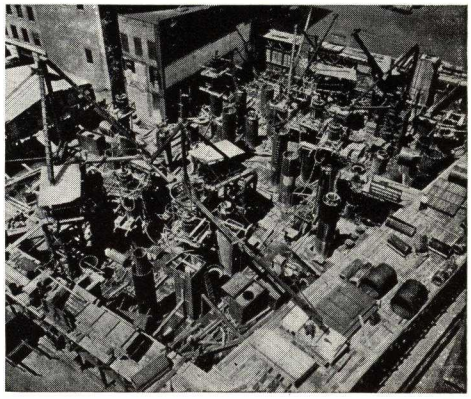
SCHEDULE OF LOADINGS ON ROCK IN TONS* FOR HERCULES STEEL PILES LESS THAN 60 FT. IN LENGTH

Thickness of shell, in.	Outside Diameter, Inches						
	10¾	12¾	14	15	16	18	20
⅜	55	70	80	90	100	120	140
7/16	60.5	77	88	99	110	132	154
½	66	84	96	108	120	144	168

*In accordance with the New York City Building Code. This code also provides for concrete filled steel piles greater than 60 ft. in length and for those driven to other materials than bedrock. If such conditions are anticipated we suggest that you consult our Engineering Department.

CAISSONS AND OTHER WORK

This company specializes also in the more familiar types of difficult foundation construction, such as open and pneumatic caissons, cofferdams, subways, tunnels, dams, bridges, etc.



Pneumatic Caisson Foundation for Evening Post Building in New York City

WESTERN FOUNDATION COMPANY

WESTERN CONCRETE PILE CORPORATION

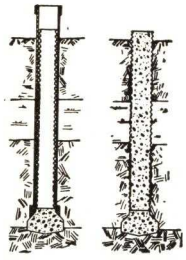
308 West Washington Street
CHICAGO, ILL.
RAndolph 6221

52 Vanderbilt Avenue
NEW YORK, N. Y.
MUrray Hill 9-6441

CAST-IN-PLACE CONCRETE PILES—CAISSONS

Advantages of Cylindrical Type

Piles are used for the transference of load through poor upper strata to firm lower strata, and the cylindrical type develops the greatest direct bearing and frictional areas in these lower strata.



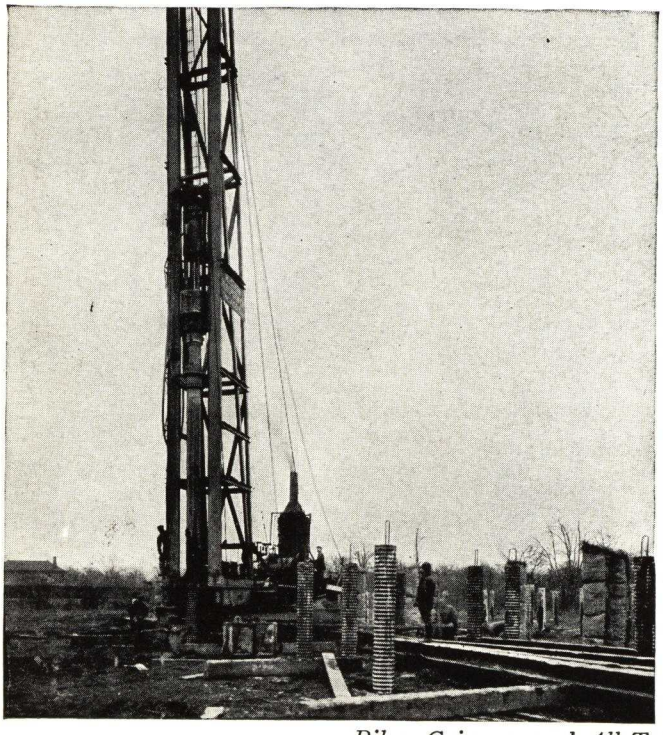
Cased Concrete Piles

Cast-in-place concrete piles in various diameters 10″ to 22″, driven to carry working loads of 30 to 100 tons each.

This type is used wherever the soil is such that it will not support an unset column of concrete.

Specification

Piles shall be of the cased, cast-in-place concrete type. The point of the pile shall be larger than the shaft of the pile and the drive casing. The concrete shall develop a crushing strength of 2500 lbs. in 28 days. The pile forming apparatus shall be driven into the ground until a resistance is reached giving the number of blows to the inch which would indicate under the Engineering News Formula $S = \frac{2W.H.}{S+0.1}$ bearing value provided for in the plans and specifications.



Composite Piles

A heavy steel casing and a solid pointed core are driven into the ground to a point well below permanent ground water level. The core is then removed and a wooden pile driven through the casing using the core as a follower. The wooden pile is provided with rope grommets to exclude water and mud. Core is removed and corrugated metal shell carrying metal cage at lower end is then inserted in casing and over the head of the wood pile. The corrugated shell is then filled with concrete and heavy casing removed.

Detail of Splice

Specification

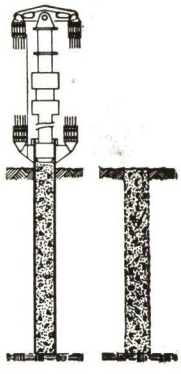
The lower wood section shall be not less than 6″ at the point and 12″ at the butt before forming the tenon. The splice shall be made so as to develop the full strength of the concrete section. Provision shall be made to lock the permanent shell to the wood section independent of the concrete.

The concrete section shall have a permanent steel shell having an average diameter of 13″ which shall be filled with 2500 lbs. concrete.

Compressed Concrete Piles

Cast-in-place concrete piles in various diameters 12″ to 24″ driven to carry working loads of 30 to 100 tons each.

This type is used wherever the soil is such that it will support an unset column of concrete.



Specification

Piles shall be cylindrical and shall have diameter called for. They shall be made of concrete developing 2500 lbs. at 28 days.

In the formation of the pile positive mechanical means shall be employed to assure that the concrete shaft will be continuous and of a minimum diameter greater than the diameter of the forming apparatus used.

The pile forming apparatus shall be driven into the ground until a resistance is reached giving the number of blows to the inch which would indicate under the E. N. Formula a bearing value equal to the load per pile provided for on plans and specifications.

Steel Bearing Pile Job for Ford Motor Company. Estimated to be the World's Biggest Foundation Project of its type. One of Western's Big Jobs.

DRILLED CAISSONS OR FOUNDATION COLUMNS

The drilled caisson type of foundation offers an economical and structurally sound method of carrying the building column construction into embedment in the rock.

Essentially, the construction consists of three parts:

(a) A junction designed to transmit the load from the superstructure column to the foundation column.

(b) A column consisting of a concrete filled steel pipe 24 in. o.d. with or without a central steel core designed as a composite column to transmit the superstructure load to the bearing section.

(c) A bearing section consisting of an uncased socket, drilled in the bed rock. The load in the column is delivered to the rock by a combination of direct bearing at the bottom of the socket and bond to the socket walls.

These caissons are designed according to the A.C.I. Code or Building Codes of Chicago or New York.

Advantages

Can be used to any depth and placed through any type of soil.

Since it occupies no more space than the building column, its use eliminates cantilevers and makes it possible to place foundations in restricted spaces.

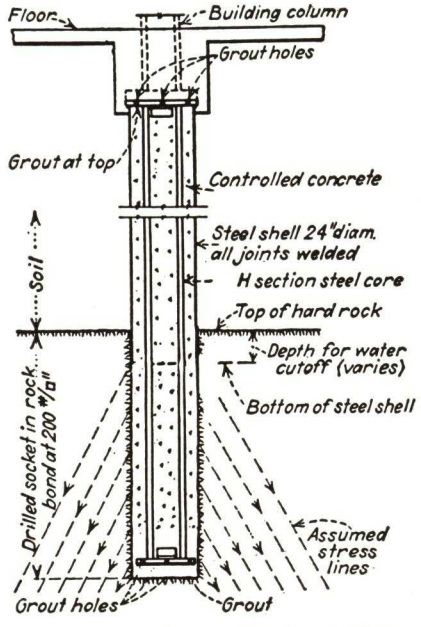
This type of caisson is fixed at both the top and bottom.

Tests

Recently tests were made for the Building Department of the City of New York. These are described in detail in an article appearing in the Engineering News-Record, issue September 9, 1937.

These tests were carried to a stress 3.2 times the working load.

A bond stress of 385 lbs. per sq. in. was developed between the concrete and the rock wall without any indication of failure.



Details of a Typical Foundation Column Drilled Into a Bedrock Socket to Provide a Load Capacity of 2,000,000 Lbs.

Services

Our engineers are at your service for consultation, designs and estimates involving foundations. Catalogues sent on request.

Contracts in the following states:

California
District of Columbia
Illinois
Indiana
Kansas
Kentucky
Maine
Massachusetts
Michigan
Missouri
Mississippi
New Jersey
New York
Ohio
Pennsylvania
Virginia
Washington
Wisconsin
West Virginia

MEMORANDA

STRUCTURAL SYSTEMS AND EQUIPMENT
- SECTION - 3

Section Number 1/5 Catalog Number

CATALOGS 1 to 54

MANUFACTURERS

THIS INDEX INCLUDES ONLY MANUFACTURERS WHOSE CATALOGS ARE FILED IN THIS SECTION

Aerocrete Corp. of America 3/30
American Cyanamid & Chemical Corp. 3/26
American Steel & Wire Co. 3/41
Ankortite Products, Inc. 3/50
Arch Roof Construction Co., Inc. 3/16
Automatic Nut Co., Inc. 3/52
Bethlehem Steel Co.
- Concrete Reinforcing 3/42
- Fabricated Steel Construction 3/3
- Joists, Trusses, etc. 3/4
- Structural Shapes 3/2

Bull Dog Floor Clip Co. 3/49
Carlson Building Specialties 3/1
Concrete Plank Co., Inc. 3/31
Concrete Steel Co. 3/43
Consolidated Expanded Metal Cos. 3/44
Crex Patent Column Co. 3/8
Detroit Steel Products Co. 3/21
Douglas Fir Plywood Assn. 3/38
Duplex Hanger Co. 3/53
Federal-American Cement Tile Co. 3/32
Hausman Steel Co. 3/39
Ideal Hanger Co. 3/54
Johns-Manville 3/45
Jones & Laughlin Steel Corp. 3/5
Lally Column Co. 3/9
Lamella Roof Syndicate, Inc. 3/18
Lathrop-Hoge Gypsum Construction Co. 3/27
Lith-I-Bar Co. 3/10
Macomber, Inc. 3/6
Mahon, R. C., Co. 3/23
Masonite Corp. 3/40
McKeown Bros. Co. 3/17
Milcor Steel Co. 3/24
Mogul Corp. 3/51
Nailcrete Corp. 3/34
National Gypsum Co. 3/28
National Naylegrip Co., Inc. 3/33
Porete Mfg. Co. 3/35
Rackle, Geo., & Sons Co. 3/36
Republic Fireproofing Co., Inc. 3/11
Richmond Screw Anchor Co., Inc. 3/46
Roberts and Schaefer Co. 3/12
Robertson, H. H., Co. 3/13
Roof Structures, Inc. 3/19
Smooth Ceilings System 3/14
Stran-Steel Div. Great Lakes Steel Corp. 3/7
Truscon Laboratories 3/37
Union Steel Products Co. 3/47
"Unit" Structures, Inc. 3/20
United States Gypsum Co. 3/29
Universal Metal Sections Div. of Ingot Iron Railway Products Co. 3/22
Wheeling Corrugating Co.
- Floor Construction 3/15
- Roof and Floor Decks 3/25

Wickwire Spencer Steel Co. 3/48

PRODUCTS

THIS INDEX INCLUDES ADDITIONAL INFORMATION WHICH IS FILED IN OTHER SECTIONS

Products described or illustrated in manufacturers' catalogs are indexed by section and catalog numbers. All names are listed alphabetically under each product heading.

ANCHORS

Ashlar
See Anchors—Veneer Wall

Concrete Inserts
See Inserts—Concrete

Door Buck
Ankortite Products, Inc. 3/50
Bull Dog Floor Clip Co. 3/49
Donley Brothers Co. 26/135
Specifications 3/50

Floor Sleeper
See Clips—Floor Sleeper

ANCHORS—Cont.

Shelf Angles
(See also Anchors—Veneer Wall)
Ankortite Products, Inc. 3/50
Carlson Building Specialties 3/1
Mogul Corp. 3/51
Peerless 3/47
Stay-Put 3/1
Union Steel Products Co. 3/47
Specifications 3/50; 3/51

Veneer Wall
Ankortite Products, Inc. 3/50
Berger Mfg. Div. Republic Steel Corp. 9/1
Berloy 9/1
Bostwick Steel Lath Co. 9/2
(Continued in Next Column)

ANCHORS—Cont.

Veneer Wall—Cont.
(Continued from Previous Column)
Bull Dog Floor Clip Co. 3/49
Concrete Steel Co. 3/43
Donley Brothers Co. 26/135
Gold Bond 9/9
National Gypsum Co. 9/9
Peerless 3/47
Security 3/43
Union Steel Products Co. 3/47
Wall-Tys 3/43
See also 3/1
Specifications 3/50

ANGLES

Structural
See Shapes—Structural

ARCH
Roof Construction
Arch Roof Construction Co., Inc. 3/16
Guastavino, R., Co. 10/40
Lamella Roof Syndicate, Inc. 3/18
Macomber, Inc. 3/6
Roberts and Schaefer Co. 3/12
Roof Structures, Inc. 3/19
Timbrel 10/40
"Unit" Structures, Inc. 3/20
Z-D 3/12
Specifications 10/40

ARCHED
Ceilings
See Ceilings—Vaulted

ARCHES
Floor
See Floor Construction
Vaulted
See Ceilings—Vaulted

ARMOR
Concrete and Asphalt Floors
Steelej 11/91

AUTOCLAVES
See 3/3

BAND AND ORCHESTRA
Shells
(See also Arch Roof Construction)
McKeown Bros. Co. 3/17

BARGES
Steel
See 3/3

BARS
Reinforcing
Bar-Tys 3/43
Bethlehem Steel Co. 3/42
Ceco Steel Products Corp. 15/6
Concrete Steel Co. 3/43
Donley Brothers Co. 26/135
Hi-Chairs 3/47
Hy-Chairs 3/43
Inland Steel Co. 11/85
J & L 3/5; 12/3; 27/3
Jones & Laughlin Steel Corp. 3/5
Secure 3/43
Truscon Steel Co. 15/23
Ty-Chairs 3/43
Union Steel Products Co. 3/47
See also 3/1
Ties, Spacers, Hangers, etc., for
See Bars—Reinforcing; Clips—Bar Concrete Reinforcing

BASES
Column
See Caps and Bases—Column
Post
See Caps and Bases—Post

BEAM
Hangers
See Hangers—Beam, Joist, Wall, etc.
Wrapping
See Caging—Wire—Beam and Girder; Concrete Reinforcement

BEAMS
Structural
See Shapes—Structural

BINS
Storage—Steel Plate
See Steel—Plate Construction

BLOCKS
Cinder Concrete—Aggregates
Nailcrete Corp. 3/34
Nailing Concrete
See Nailing Concrete

BOILER
Breechings
See Steel—Plate Construction
Plate Work
See Steel—Plate Construction

BONDING
Forms
See Forms—Metal

BOXES
Wall—Metal—for Hangers
Duplex Hanger Co. 3/53
Ideal Hanger Co. 3/54

BRACKETS
Column
See Caps and Bases—Column

BREECHINGS
Smokestack
See Steel—Plate Construction

BRIDGES
Steel
See Structural—Steel—Fabricators, Designers and Welders
Suspension
See 3/3

BRIDGING
Joist
See Joists—Steel

BUILDINGS
Industrial — Reinforced Concrete or Brick and Steel
Rust Engineering Co. 26/130
Standardized—Steel
Bethlehem Steel Co. 3/3
J & L 12/3; 27/3

CAGING
Wire—Beam, Girder and Column
American Steel & Wire Co. 3/41
Bethlehem Steel Co. 3/42
Concrete Steel Co. 3/43
Consolidated Expanded Metal Cos. 3/44
Reed 3/47
Steelcrete 3/44
Triangle Mesh 3/41
Truscon Steel Co. 15/23
USS 3/41
Union Steel Products Co. 3/47
See also 15/6

CAISSONS
Concrete—Expansion Joints
See Joints—Expansion—Concrete

CAPS AND BASES
Column
Crex Patent Column Co. 3/8
Hartman-Sanders Co. 8/24
Lally Column Co. 3/9
Schwerd, A. F., Mfg. Co. 8/25
Union Metal Mfg. Co. 8/23
See also 13/44
Post
Duplex Hanger Co. 3/53
Flush-Metal Partition Corp. 20/18
Ideal Hanger Co. 3/54
See also 3/1; 13/44

CEILINGS
Reinforced Concrete
See Floor Construction
Suspended—Concrete Inserts for
See Inserts—Concrete

CEILINGS—Cont.
Vaulted
Guastavino, R., Co. 10/40
Roberts and Schaefer Co. 3/12
Timbrel 10/40
Z-D 3/12
Specifications 10/40

CHAIRS
Bar—Concrete Reinforcement
See Clips—Bar—Concrete Reinforcing

CHANNELS
Structural
See Shapes—Structural

CHEMICAL PLANT
Equipment
(Including Agitators, Condensers, Gasoline, Absorbers, After-Coolers, Autoclaves, Pans, Stills, Cylinders, Dye Kettles, Nitrators, Acid and Absorbing Towers)
Bethlehem Steel Co. 3/3
See also 27/55

CLAMPS
Beam, Joist, Column, Wall, etc.
Ceco Steel Products Corp. 15/6
J & L 3/5
Jones & Laughlin Steel Corp. 3/5
Meyer 15/6
Richmond Screw Anchor Co., Inc. 3/46
Superior 3/46
Symons' 3/46
See also 3/1

CLIPS
Anchor—Acoustical Ceiling
Ankortite Products, Inc. 3/50
Specifications 3/50
Bar—Concrete Reinforcing
(Including Ties and Hangers)
Bar-Tys 3/43
Bethlehem Steel Co. 3/42
Concrete Steel Co. 3/43
Donley Brothers Co. 26/135
Hy-Chairs 3/43
J & L 3/5
Jones & Laughlin Steel Corp. 3/5
Peerless 3/47
Richmond Screw Anchor Co., Inc. 3/46
Securo 3/43
Superior 3/46
Ty-Chairs 3/43
U-Lock Hi-Chairs 3/47
Union Steel Products Co. 3/47
See also 15/6
Beam Reinforcement
Concrete Steel Co. 3/43
Consolidated Expanded Metal Cos. 3/44
J & L 3/5
Jones & Laughlin Steel Corp. 3/5
Reed 3/47
Steelcrete 3/44
Truscon Steel Co. 15/23
Union Steel Products Co. 3/47
Floor Sleeper
Ankortite Products, Inc. 3/50
Bethlehem Steel Co. 3/42
Bull Dog Floor Clip Co. 3/49
Carlson Building Specialties 3/1
J & L 3/5
Jones & Laughlin Steel Corp. 3/5
Mogul Corp. 3/51
Shurebond 9/5
Stay-Put 3/1
Union Steel Products Co. 3/47
Specifications 3/50; 3/51

CLIPS—Cont.

Soffit
See Caging—Wire—Beam, Girder and Columns

COLUMNS

Moulds or Forms
See Forms—Metal

Steel
J & L 12/3
See also 21/88; 28/29

Steel—Concrete Filled
Crex Patent Column Co. 3/8
Lally Column Co. 3/9
Specifications 3/9

CONCRETE

Anchor Floor Sleeper
See Clips—Floor Sleeper

Blocks
See Concrete—Light Weight

Filler Tile
Porete Mfg Co. 3/35
Republic Fireproofing Co., Inc. ... 3/11
Slagblok 3/11

Floor Construction
See Floor Construction

Floor Sleeper Clips
See Clips—Floor Sleeper

Forms
See Forms

Inserts
See Inserts—Concrete

Joists
See Joists—Reinforced Concrete—Precast

Lightweight
Aerocrete Corp. of America ... 3/30
Cantilite 3/31
Concrete Plank Co., Inc. 3/31
Federal-American Cement Tile Co. 3/32
Gritcrete 3/30
Haydite 3/32; 3/36; 3/37
Nailcrete Corp. 3/34
Nailfill 3/35
National Naylegrip Co., Inc. 3/33
Naylegrip 3/33
Porete-Fill 3/35
Porete Mfg. Co. 3/35
Rackle, Geo., & Sons Co. 3/36
Truscon Laboratories 3/37
See also 10/7
Specifications 3/30; 3/31; 3/32; 3/34; 3/36

Nailing Base, see
—Nailing Concrete
—Tile—Hollow or Solid—Cinder Concrete 4

Reinforced Joists
See Joists

Reinforcement—Bars and Rods
See Bars—Reinforcing

Reinforcement—Beam Wrappers
See Caging—Wire—Beam, Girder and/or Column

Reinforcement—Continuous Wire Mesh for Beams and Girders
See Caging—Wire Beam, Girder or Column

Reinforcement—Expanded and/or Perforated Sheet
See Lath—Expanded and/or Perforated Metal Sheet 9

CONCRETE—Cont.

Reinforcement—Floor Forms or Tiles
See Forms—Metal

Reinforcement—Wire Mesh
American Steel & Wire Co. ... 3/41
Berger Mfg. Div. Republic Steel Corp. 9/1
Berloy 9/1
Clinton 3/48
Concrete Steel Co. 3/43
Consolidated Expanded Metal Cos. 3/44
Cop-R-Loy 27/6
J-M 3/45
Johns-Manville 3/45
Steelcrete 3/44
Triangle Mesh 3/41
Truscon Steel Co. 15/23
USS 3/41
Wheeling Steel Corp. 27/6
Wickwire Spencer Steel Co. 3/48
Specifications 3/44; 3/45

Reinforcement—Wire Mesh—Paper Combination
J-M 3/45
Johns-Manville 3/45
Steeltex 3/45
Specifications 3/45

Reinforcing Devices
See Clips—Bar Concrete Reinforcing

CONTRACTORS

Floor Construction
American Cyanamid & Chemical Corp. 3/26
Lathrop-Hoge Gypsum Construction Co. 3/27
Maximent Co. 11/13
USG 3/29
United States Gypsum Co. 3/29

Hollow Tile Fireproofing
USG 3/29
United States Gypsum Co. 3/29

Roof Truss
Arch Roof Construction Co., Inc. 3/16
McKeown Bros. Co. 3/17
"Unit" Structures, Inc. 3/20

Vaulted Arch
Guastavino, R., Co. 10/40

CORK

Expansion Joints
See Joints—Expansion—Premoulded

CYLINDERS

Creosoting
See 3/3

DECKS

Floor
See Floor Construction

Roof
See Roof Construction

DOME CONSTRUCTION

Vaulted
Guastavino, R., Co. 10/40
Roberts and Schaefer Co. 3/12
Timbrel 10/40
Z-D 3/12
Specifications 10/40

DRYERS

Rotary
See 3/3

DUCTS

Steel Plate
See Steel—Plate Construction

ENGINEERS

Floor Construction
See Floor Construction

Structural Steel
See Structural—Steel Fabricators, Designers and Welders

EXPANSION

Joints
See Joints—Expansion—Concrete

FABRIC

Concrete Reinforcement
See Concrete—Reinforcement—Wire Mesh

FABRICATORS

Steel Plate
See Steel—Plate Construction

Structural Steel
See Structural—Steel Fabricators, Designers and Welders

FILLER

Tile
See Concrete—Filler Tile

FLOATS

Car
See 3/3

FLOOR

Arches
See Floor Construction

Clips
See Clips—Floor Sleeper

Forms—Metal
See Forms—Metal

Sleeper Anchors
See Clips—Floor Sleeper

Sleeper Supports
See Clips—Floor Sleeper

Voids—Slag Concrete Filler Tile
See Concrete—Filler Tile

FLOOR CONSTRUCTION

Concrete—Precast Joist Combination
Portland Cement Assn. 4/44

Concrete Reinforced—Flat Slab
Hausman Steel Co. 3/39
Smooth Ceilings System 3/14

Concrete Reinforced — Lightweight — Joist and Filler Tile
Porete Mfg. Co. 3/35
Republic Fireproofing Co., Inc. 3/11
Slagblok 3/11

Concrete — T-Beam and Metal Forms
Berger Mfg. Div. Republic Steel Corp. 9/1
Berloy 9/1
Bethlehem Steel Co. 3/42
Ceco Steel Products Corp. 15/6
Concrete Steel Co. 3/43
Cop-R-Loy 3/25
Detroit Steel Products Co. 3/21
Floretyle 15/23
Goldsmith Metal Lath Co. 9/5
Hausman Steel Co. 3/39
Holorib 3/21
Locktyle 15/23
Metrodeck 9/5
Meyer Steelforms 15/6
Milcor Steel Co. 3/24
Phoenix 9/5
Plastoform 9/5
Shurebond 9/5
Shurebond Unit System 9/5
Tri-Rib 3/25
Truscon Steel Co. 15/23
Wheeling Corrugating Co. 3/25

FLOOR CONSTRUCTION—Cont.

Gypsum—Slab or Tile Form

American Cyanamid & Chemical Corp. 3/26
Gypsteel Gypsum Plank 3/26
Hoge 3/27
Lathrop-Hoge Gypsum Construction Co. 3/27
National Gypsum Co. 3/28
Pyrobar 3/29
Sheetrock-Pyrofill 3/29
United States Gypsum Co. 3/29
USG 3/29
Specifications 3/29

Hollow Tile—Flat and Segmental Arch

Mathieson Alkali Works, Inc. ... 9/16
Natco Segmentile 4/42
National Fireproofing Corp. 4/42

Light Weight

(See also Concrete—Light Weight)
Aerocrete Corp. of America ... 3/30
Cantilite 3/31
Celotex Corp. 10/22
Concrete Plank Co., Inc. 3/31
Gritcrete 3/30
Hoge 3/27
L.S. 3/30
Lathrop-Hoge Gypsum Construction Co. 3/27
National Gypsum Co. 3/28
Porete Mfg. Co. 3/35
Porex 3/35
Rackle, Geo., & Sons Co. 3/36
R.S. 3/30
Specifications 3/30; 3/31; 3/36

Nailing Concrete

See Nailing Concrete

Steel Truss, Plate Joist, I-Beam or Spiral

(See also Joists—Steel Truss; Joists—Steel Plate Girder)
Alpha System 3/35
Bethlehem Steel Co. 3/4
J & L 3/5
Jones & Laughlin Steel Corp. 3/5
Junior Beam 3/5
Long-Span 3/15
Longspan 3/4
MacMar 3/4
O-T 15/23
Porete Mfg. Co. 3/35
RPM 3/13
Robertson, H. H., Co. 3/13
Stran-Steel Div. Great Lakes Steel Corp. 3/7
Truscon Steel Co. 15/23
Universal Metal Sections Div. of Ingot Iron Railway Products Co. 3/22
Wheeling Corrugating Co. 3/15
See also 15/6
Specifications 3/5; 3/7

FORM

Ties, Clamps and Spreaders

Ceco Steel Products Corp. 15/6
D-B 3/51
Form-Ty 3/46
Meyer 15/6
Richmond Screw Anchor Co., Inc. 3/46
Snap-Tys 3/46
Tilt Locks 3/46
Tyloops 3/46
Tyscrus 3/46
Union Steel Products Co. 3/47
See also 3/1; 3/51

FORMS

Fiber—Concrete

Armstrong Corp Products Co. .. 10/43
Celotex Corp. 10/22
(Continued in Next Column)

FORMS—Cont.

Fiber—Concrete—Cont.

(Continued from Previous Column)
Masonite Corp. 3/40
Tempered Presdwood 3/40
Temwood 10/43
Thermax 10/22
Specifications 3/40

Filler Tile

See Concrete—Filler Tile

Metal

Berger Mfg. Div. Republic Steel Corp. 9/1
Berloy 9/1
Bethlehem Steel Co. 3/42
Ceco Steel Products Corp. 15/6
Concrete Steel Co. 3/43
Cop-R-Loy 3/25
Detroit Steel Products Co. 3/21
Floretyle 15/23
Goldsmith Metal Lath Co. 9/5
Hausman Steel Co. 3/39
Holorib 3/21
Locktyle 15/23
Metrodeck 9/5
Meyer Steelforms 15/6
Phoenix 9/5
Plastoform 9/5
Shurebond 9/5
Shurebond Unit System 9/5
Tri-Rib 3/25
Truscon Steel Co. 15/23
Wheeling Corrugating Co. 3/25

Plywood

Douglas Fir Plywood Assn. 3/38; 8/18
Harbor Plywood Corp. 8/19
Laminex 14/60
Laminex-Plyform 14/60
Plycrete 8/19
Plyform 8/18
Plyform Laminex 8/22
Plyscord 8/21
Super-Harbord 8/19
United States Plywood Corp. 8/21
Wheeler-Osgood Sales Corp. 8/22; 14/60

FRAMES

Steel

(See also Shapes—Non-structural—Lightweight Framing)
Metal Clad Doors, Inc. 14/13
Stran-Steel Div. Great Lakes Steel Corp. 3/7
Specifications 3/7

FURRING

Spacers

Ankortite Products, Inc. 3/50
Specifications 3/50

Suspended Ceiling Rods

Union Steel Products Co. 3/47

GAS

Holders—Lift and Pressure

Bethlehem Steel Co. 3/3

GIRDERS

Steel Plate

Bethlehem Steel Co. 3/2
Concrete Steel Co. 3/43
Consteel 3/43
J & L 12/3; 27/3
Truscon Steel Co. 15/23

GYPSUM

Floors

See Floor Construction—Gypsum

Roofs

See Roof Construction—Gypsum

HANGERS

Bar—Concrete Reinforcement

See Bars—Reinforcing

Beam, Joist, Wall, etc.

Duplex Hanger Co. 3/53
(Continued in Next Column)

HANGERS—Cont.

Beam, Joist, Wall, etc.—Cont.

(Continued from Previous Column)
Ideal Hanger Co. 3/54
J & L 3/5
Jones & Laughlin Steel Corp. 3/5
R&L 3/53
See also 3/1

Form Concrete

Richmond Screw Anchor Co., Inc. 3/46
Superior 3/46
Tyhanger 3/46

HOUSES

Metal, Portable, Wood, etc.

See Buildings

HULLS

Boat—Steel

See 3/3

INSERTS

Concrete

Ackerman-Johnson Co. 16/43
Ankortite Products, Inc. 3/50
Bethlehem Steel Co. 3/42
Carlson Building Specialties 3/1
C-B 26/114
Concrete Steel Co. 3/43
Dayton 3/43
Donley Brothers Co. 26/135
E-Z 26/92
Goldsmith Metal Lath Co. 9/5
Grinnell Co., Inc. 26/114
Healy-Ruff Co. 26/92
J & L 3/5
Jones & Laughlin Steel Corp. 3/5
Mogul Corp. 3/51
Peerless 3/47
Sargent 13/45
Shurebond 9/5
Simplex 26/114
Stay-Put 3/1
Truscon Steel Co. 15/23
Union Steel Products Co. 3/47
Universal 26/114
Windshield Scupper Div. Sargent Building Specialties Co. 13/45
Specifications 3/50; 3/51

JOINTS

Expansion—Concrete

Air-Cushion 15/23
Armored Concrete Corp. 13/44
Celotex Corp. 10/22
Flexcell 10/22
Truscon Steel Co. 15/23

Structural—Pressure Relieving

Barrett Co. 6/2
Builders' Cushion Joint Co. 4/27
Specifications 4/27; 6/2

JOISTS

Bridging for

See Bridging—Joist

Hangers for

See Hangers—Beam, Joist

Reinforced Concrete—Precast

Lith-I-Bar Co. 3/10
Marcrome Art Marble Co. 12/9
Portland Cement Assn. 4/44
Specifications 3/10

Steel

(See also Shapes—Structural; Girders)
Bethlehem Steel Co. 3/2; 3/4
Ceco Steel Products Corp. 15/6
Clerespan 15/23
Concrete Steel Co. 3/43
Consteel 3/43
J & L 3/5; 12/3; 27/3
Jones & Laughlin Steel Corp. 3/5
(Continued on Next Page)

JOISTS—Cont.
Steel—Cont.
(Continued from Previous Page)
Junior Beam 3/5
Long-Span 3/15
Longspan 3/4
MacMar 3/4
Macomber, Inc. 3/6
Meyer 15/6
Nailer 15/23
O-T 15/23
Stran-Steel Div. Great Lakes Steel Corp. 3/7
Truscon Steel Co. 15/23
Universal Metal Sections Div. of Ingot Iron Railway Products Co. 3/22
Wheeling Corrugating Co. 3/15
Specifications 3/5; 3/7; 15/23

KETTLES
Galvanizing
See 3/3

LATH
Floor
See Lath—Expanded and/or Perforated Metal Sheet 9

LOG
Houses
P & H 8/13
Page & Hill Co. 8/13

MASTS
Wireless
See Structural—Steel Fabricators, Designers and Welders

METAL
Construction
See Steel Plate Construction
Fabric
See Concrete Reinforcement — Wire Mesh
Fabric—Wove
See Metal Fabric 26

MORTAR
Nailing Concrete
See Nailing—Concrete

NAILING
Concrete
Federal-American Cement Tile Co. 3/32
Nailbond 3/33
Nailcrete Corp. 3/34
Nailfil 3/35
National Naylegrip Co., Inc. 3/33
Naylegrip 3/33
Porete Mfg. Co. 3/35
Rackle, Geo., & Sons Co. 3/36
Truscon Laboratories 3/37
Specifications 3/32; 3/33; 3/34; 3/36

NAILS
Concrete
USG 9/13
United States Gypsum Co. 9/13
See also 3/1

NUTS AND BOLTS
Rib
Anco-Nut 3/52
Automatic Nut Co., Inc. 3/52
Specifications 3/52

OIL REFINERY
Equipment
Bethlehem Steel Co. 3/3

PANS
Annealing, Drying and Evaporating
See 3/3

PAVEMENTS
Expansion Joints for
See Joints—Expansion—Concrete

PERFORATED METAL
Concrete Reinforcement
See Lath—Expanded and/or Perforated Metal Sheet

PLANKS
Concrete—Lightweight
See Slabs
Gypsum
See Slabs—Precast—Gypsum

PLATES
Wall Bearing—Metal
(See also Hangers—Beam, Joist, Wall, etc.)
J & L 3/5
Jones & Laughlin Steel Corp. 3/5
Stran-Steel Div. Great Lakes Steel Corp. 3/7
See also 3/1

PLINTHS
Column
See Caps and Bases—Column

PLUGS
Wall—For Concrete
Ankortite Products, Inc. 3/50
Bull Dog Floor Clip Co. 3/49
See also 3/1
Specifications 3/50

PONTOONS
Steel
See 3/3

POST
Caps and Bases
See Caps and Bases—Post

PRESSURE
Relieving—Structural Joints
See Joints—Structural—Pressure Relieving

PROMENADE DECK COVERING
See Floor Construction—Light Weight

RADIO
Masts
See Structural—Steel Fabricators, Designers and Welders

REINFORCEMENT
Beam or Column Wrappers
See Caging—Wire, Beam or Column Covering
Concrete
See Bars—Reinforcing; Concrete Reinforcement — Expanded and/or Perforated Metal Sheet

REINFORCING
Devices
See Clips—Bar—Concrete Reinforcement

RIVET
Bolt
Automatic Nut Co., Inc. 3/52

RODS AND BARS
Reinforcing—Concrete
See Bars—Reinforcing

ROOF
Deck
See Roof Construction
Insulation
See Roof Construction—Gypsum
Trusses
See Trusses—Arch Construction

ROOF CONSTRUCTION
Concrete — T-Beam and Metal Forms
See Floor Construction
Concrete Reinforced and Slag Concrete Block
Republic Fireproofing Co., Inc. 3/11
Expansion Joints for
See Joints—Expansion—Concrete
Gypsum—Slab or Tile Form
American Cyanamid & Chemical Corp. 3/26
Gypsteel Gypsum Plank 3/26
Hoge 3/27
Lathrop-Hoge Gypsum Construction Co. 3/27
Marks T 3/29
National Gypsum Co. 3/28
Pyrobar 3/29
Pyrofill 3/29
Red Top 3/29
Sheetrock-Pyrofill 3/29
USG 3/29
United States Gypsum Co. 3/29
Weatherwoods-Pyrofill 3/29
Specifications 3/29
Lightweight Slab
(See also Concrete—Lightweight)
Aerocrete Corp. of America 3/30
Cantilite 3/31
Celotex Corp. 10/22
Cemesto 10/22
Concrete Plank Co., Inc. 3/31
Federal-American Cement Tile Co. 3/32
Gritcrete 3/30
Hoge 3/27
Lathrop-Hoge Gypsum Construction Co. 3/27
National Gypsum Co. 3/28
National Naylegrip Co., Inc. 3/33
Porete Mfg. Co. 3/35
Porex 3/35
R.S. 3/30
Rackle, Geo., & Sons Co. 3/36
Thermax 10/22
Truscon Laboratories 3/37
Specifications 3/30; 3/31; 3/32; 3/36; 10/22
Metal Sheet—Insulated
Detroit Steel Products Co. 3/21
Fenestra-Holorib 3/21
Ferrobord 15/23
Ferrocoustic Steeldeck 15/23
Goldsmith Metal Lath Co. 9/5
Holorib 3/21
La-Ho-Co 3/27
Lathrop-Hoge Gypsum Construction Co. 3/27
Long-Span 3/15
Macomber, Inc. 3/6
Mahon, R. C., Co. 3/23
Metrodeck 9/5
Milcor Steel Co. 3/24
Porete Mfg. Co. 3/35
RPM 6/34
Robertson, H. H., Co. 6/34
Sanacoustic 3/21
Truscon Steel Co. 15/23
USG 3/29
United States Gypsum Co. 3/29
Universal Metal Sections Div. of Ingot Iron Railway Products Co. 3/22
Wheeling Corrugating Co. 3/15
Specifications 3/21
Precast Tile
See Slabs—Precast—Gypsum
Rotating, Folding, Sliding, etc.—Motor Operated
Babcock-Davis Corp. 14/29
See also 21/55

ROOF CONSTRUCTION—Cont.
Steel Deck—Insulated
See Roof Construction—Metal Sheet—Insulated
Steel Truss and Joist
Bethlehem Steel Co. 3/4
Long-Span 3/15
Longspan 3/4
MacMar 3/4
Macomber, Inc. 3/6
RPM 3/13
Robertson, H. H., Co. 3/13
Universal Metal Sections Div. of Ingot Iron Railway Products Co. 3/22
Wheeling Corrugating Co. 3/15
Sub—Nailing Concrete
See Nailing Concrete
Trusses for
See Trusses
Trussless (Patented)
See Trusses—Arch Construction

ROOFING
Tile
See Tile Form—Roofing

ROOFS
Constructed
See Roof Construction

SADDLES
Beam
See Clips—Bar—Concrete—Reinforcing

SCRUBBERS
Gas
See 3/3

SEPARATORS
Reinforcing Steel
See Clips—Bar—Concrete Reinforcement

SHAPES
Non-structural
See Extruded or Drawn Metal Shapes 13
Non-structural — Lightweight Framing
Stran-Steel Div. Great Lakes Steel Corp. 3/7
Specifications 3/7
Structural
(Including: Angles, Channels, I-Beams, Trusses, etc.)
Alcoa 13/1
Aluminum Co. of America 13/1
American Brass Co. 13/14
Anaconda 13/14
Armored Concrete Corp. 13/44
Bethlehem Steel Co. 3/2; 3/4
Byers, A. M., Co. 27/1
Ceco Steel Products Corp. 15/6
Clerespan 15/23
Concrete Steel Co. 3/43
Consteel 3/43
Enduro 13/5
J & L 3/5; 12/3; 27/3
Jones & Laughlin Steel Corp. 3/5; 12/3
Junior Beam 3/5
Long-Span 3/15
Longspan 3/4
MacMar 3/4
Macomber, Inc. 3/6
Nailer 15/23
O-T 15/23
Republic Steel Corp. 13/5
Truscon Steel Co. 15/23
USS 13/7
United States Steel Corp. Subsidiaries 13/7
(Continued in Next Column)

SHAPES—Cont.
Structural—Cont.
(Continued from Previous Column)
Universal Metal Sections Div. of Ingot Iron Railway Products Co. 3/22
Wheeling Corrugating Co. 3/15
See also 11/85
Specifications 3/5; 15/23

SHEET METAL
Perforated — Concrete Reinforcement
See Lath—Expanded and/or Perforated Metal Sheet 9

SHELL
Roof Construction
See Arch—Roof Construction

SLABS
Concrete—Light Weight
See Concrete—Lightweight
Nailing Concrete
See Nailing—Concrete
Partition — Light Weight Concrete
See Concrete—Light Weight
Precast—Gypsum
(See also Floor Construction)
American Cyanamid & Chemical Corp. 3/26
Gypsteel 3/26
Gypsteel Gypsum Plank 3/26
Hoge 3/27
Lathrop-Hoge Gypsum Construction Co. 3/27
National Gypsum Co. 3/28
Pyrobar 3/29
USG 3/29
United States Gypsum Co. 3/29
See also 4/43
Specifications 3/29
Reinforced Cement or Concrete Tile
See Floor Construction—Concrete—Reinforced—Flat Slab
Sheet Metal—Roof
See Roof Construction—Metal Sheet

SLAG
Concrete
See Concrete—Filler Tile

SLEEPERS—FLOOR
Anchors for
See Clips—Floor Sleepers

SLOTS
Masonry—Metal
Ankortite Products, Inc. 3/50
Specifications 3/50

SMOKE
Stacks—Steel
See 3/3; 26/94; 26/101

SOCKETS
Ceiling
See Inserts—Concrete

SOFFIT
Clips
See Caging—Wire—Beam—Girder or Column

SOUND DEADENING MATERIALS
Gypsum, see
—Floor Construction—Gypsum; Concrete—Filler Tile
—Tile Form—Hollow—Gypsum 4
Nailing Concrete
See Nailing—Concrete

SPACERS
Bar—Concrete Reinforcement
See Clips—Bar—Concrete Reinforcing
Form
See Form—Ties, Clamps and Spacers

STACKS
Breeching
See Steel—Plate Construction
Smoke—Steel
See Smoke—Stacks—Steel; Steel—Plate Construction

STANDPIPES
Steel
See Steel—Plate Construction

STEEL
Concrete Reinforcement
See Concrete—Reinforcement
Decks
See Decks 3
Designers, Fabricators and Erectors
See Structural—Steel Fabricators, Designers and Welders
Joists
See Joists—Steel; Structural—Shapes
Plate Construction
Caldwell, W. E., Co., Inc. 27/55
Farrar & Trefts Inc. 26/96
J & L 12/3; 27/3
Roanoke Iron & Bridge Works, Inc. 21/46
See also 3/3; 11/89; 26/94; 26/101; 27/55
Structural
See Shapes—Structural

STIRRUPS
Metal
See Clips—Bar—Concrete Reinforcing; Caging—Wire—Beam and Girder

STRIP
Lath
See Lath—Expanded and/or Perforated Sheet 9

STRUCTURAL
Shapes — Angles, Channels, I-Beams, Trusses, etc.
See Shapes—Structural
Steel Fabricators, Designers and Welders
Bethlehem Steel Co. 3/2; 3/3
Decatur Iron & Steel Co. 21/42
Disco 13/18; 21/42
Flour City Ornamental Iron Co. 15/11
J & L 12/3; 27/3
Jones & Laughlin Steel Corp. 12/3
Rust Engineering Co. 26/130
Truscon Steel Co. 15/23
See also 11/89; 11/93; 13/37
Steel Trusses
See Trusses—Steel and Timber
Timber Truss Fabricators and Designers
See Trusses—Arch Construction

STUCCO
Nailing Concrete
See Nailing—Concrete

SWIMMING POOL
Expansion Joints
See Joints—Expansion—Concrete

TANK
Structures
See Structural—Steel Fabricators and Designers

TANKS
Surge
Everson Mfg. Co. 21/69
Specifications 21/69

TANKS AND VESSELS
Pressure
See Tanks—Pressure 27

TIES
Bar—Concrete Reinforcing
See Clips—Bar Concrete Reinforcing
Wall—Metal
See Anchors—Veneer Wall

TILE FORM
Floor—Gypsum
See Floor Construction—Gypsum
Roofing — Concrete Slab — Light Weight, see
—Concrete—Light Weight
—Tile Form—Roofing—Reinforced Cement 6
Roofing—Glass Insert
Truscon Laboratories 3/37
Roofing—Gypsum
See Roof Construction—Gypsum—Slabs or Tile Form; Slabs—Precast Gypsum
Steel—Floor
See Forms—Metal

TIPPLES
Coal
See 3/3

TOWERS
Transmission, Wireless, etc.—Steel
Bethlehem Steel Co. 3/3

TRUSSED
Steel Joist
See Joists

TRUSSES
Arch Construction
Arch Roof Construction Co., Inc. 3/16
Lamella Roof Syndicate, Inc. 3/18
Macomber, Inc. 3/6
McKeown Bros. Co. 3/17
Roberts and Schaefer Co. 3/12
Roof Structures, Inc. 3/19
"Unit" Structures, Inc. 3/20
Z-D 3/12
Steel
See Shapes—Structural; Joists
Steel and Timber
Roof Structures, Inc. 3/19
Wood
McKeown Bros. Co. 3/17
Roof Structures, Inc. 3/19

TURNTABLES
Locomotive
See 3/3

VAULTS
Arched
See Ceilings—Vaulted

WALL
Hangers
See Hangers—Beam, Joist, Wall, etc.
Ties
See Anchors—Veneer Wall

WIRE
Beam Caging
See Caging—Wire—Beam, Girder or Column
Concrete Reinforcement
See Concrete—Reinforcement—Wire Mesh
Mesh
See Concrete Reinforcement—Wire Mesh

WOOD
Nailer Joists, see Joists—Steel
Trusses
See Trusses—Wood

WRAPPING
Beam
See Caging—Wire Beam, Girder and Column

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Special items made up on short notice.

"Stay-Put" Shelf Angle Concrete Inserts

These inserts are adjustable vertically and displace anchor bolts, with their slow and unsatisfactory placing in concrete.

The fixture is nailed to the concrete form with two nails, one at each end of fixture. The bolts are inserted in the fixture and can be adjusted to a perfect level by raising or lowering the bolt.

The fixture is of A-1 malleable iron and will take a $\frac{5}{8}$-in. or $\frac{3}{4}$-in. bolt. It can be zinc coated or galvanized if so required.

Special length bolts can be supplied if required.

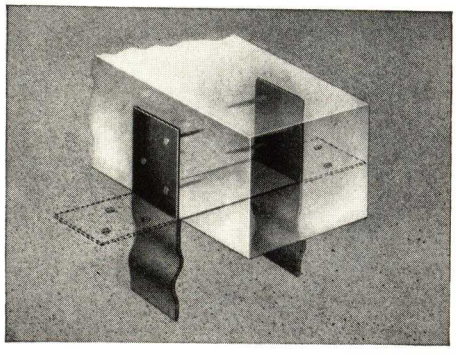
"Stay-Put" Floor Sleeper Clips

For attaching wood sleepers to concrete floors; are easily set into the concrete and will save time and money. Made of No. 20 gauge galvanized steel, $1\frac{1}{4}$ in. wide.

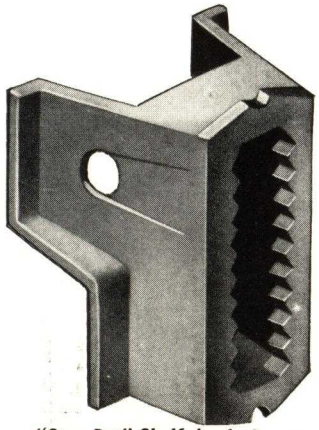
As you set the clip flush with the floor, the ears or lugs lay flat on the floor and it is ready to receive the wood sleeper. The lugs need not be raised until sleeper is in place; then nail the lugs to the sides of the sleeper.

This is an exceptionally close fitting Sleeper Clip and leaves a firm floor level with no friction or squeaks.

Specify the "Stay-Put" Floor Sleeper Clip and save money.

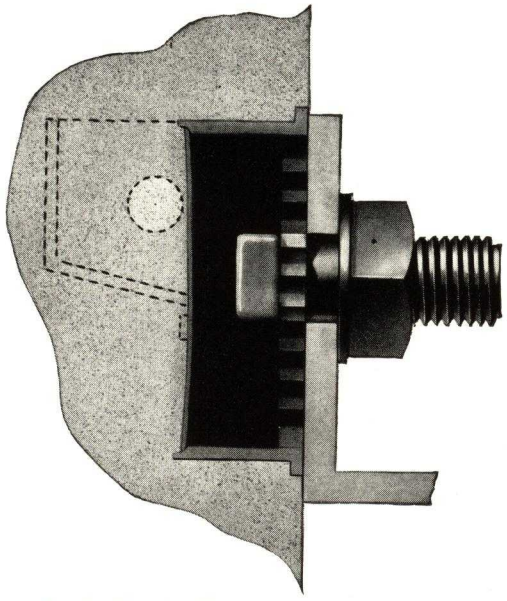


"Stay-Put" Sleeper Clip In Place



"Stay-Put" Shelf Angle Insert

Heat Treated Steel Bolt



Section Showing Shelf Angle Insert with Angle Bolted to Frame

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EXPORT DISTRIBUTOR: Bethlehem Steel Export Corporation, 25 Broadway, NEW YORK, N. Y.

For Other Bethlehem Pages, see File Index

BETHLEHEM STRUCTURAL SHAPES

Uses

Bethlehem Wide-Flange Shapes are used in all sizes of buildings and bridges. Light Beams and Joists are used especially for floor construction in buildings designed for lighter floor loads; also in the roof construction of all types of buildings. Stanchions are used as columns or posts in connection with Bethlehem Light Beams and Joists and other structural Shapes.

Advantages

Bethlehem Wide-Flange Structural Shapes are rolled from high grade structural steel on Bethlehem's Grey Mills. These sections combine the advantages of light weight with economy in fabrication.

Bethlehem Wide-Flange Shapes, Including Light Beams, Special Beams, Joists, Special Subway Columns and Stanchions Showing Nominal Dimensions, Weight and Section Modulus

*Section No.	Weight per ft., lb.	Section modulus, in.³
36″WF 36″x16½″	300	1105.1
	280	1031.2
	260	951.1
	250	911.7
	240	873.6
	230	835.5
	194	663.6
36″WF 36″x12″	182	621.2
	170	579.1
	160	541.0
	150	502.9
	240	811.1
33″WF 33″x15¾″	220	740.6
	210	704.4
	200	669.6
	152	486.4
33″WF 33″x11½″	141	446.8
	132	413.7
	125	385.1
	210	649.9
	200	617.6
30″WF 30″x15″	190	586.1
	180	555.2
	172	528.2
	132	379.7
30″WF 30″x10½″	124	354.6
	116	327.9
	108	299.2
	177	492.8
27″WF 27″x14″	163	452.9
	154	427.8
	145	402.9
	114	299.2
27″WF 27″x10″	106	277.2
	98	255.3
	91	233.2
24″WF 24″x14″	160	413.5
	150	385.5
	140	358.6
	130	330.7
	120	299.1
24″WF 24″x12″	110	274.4
	100	248.9
	94	220.9
24″WF 24″x9″	87	204.3
	80	185.8
	74	170.4
	142	317.2
21″WF 21″x13″	132	294.8
	122	272.5
	112	249.6
	103	213.1
21″WF 21″x9″	96	197.6
	89	182.8
	82	168.0
	73	150.7
21″WF 21″x8¼″	68	139.9
	63	128.0
	59	119.3
	124	239.0
18″WF 18″x11¾″	114	220.1
	105	202.2
	96	184.4
	85	156.1
18″WF 18″x8¾″	77	141.7
	70	128.2
	64	117.0
18″WF 18″x7½″	55	98.2
	50	89.0
	47	82.3
16″WF 16″x11½″	114	197.4
	105	181.7
	96	166.1
	88	151.3
	78	127.8
16″WF 16″x8½″	71	115.9
	64	104.2
	58	94.1
	50	80.7
16″WF 16″x7″	45	72.4
	40	64.4
	36	56.3
	426	707.4
	412	682.1
	398	656.9
	384	632.2
	370	608.1
	356	583.6
	342	559.4
	328	535.8
	314	511.9
	300	488.2
	287	465.5
	273	442.0
14″WF 14″x16″	264	427.4
	255	412.0
	246	397.4
	237	382.2
	228	367.8
	219	352.6
	211	339.2
	202	324.9
	193	310.0
	184	295.8
	176	281.9
	167	267.3
	158	253.4
	150	240.2
	142	226.7
14″WF	320	492.8
	136	216.0
	127	202.0
14″WF 14″x14½″	119	189.4
	111	176.3
	103	163.6
	95	150.6
	87	138.1
14″WF 14″x12″	84	130.9
	78	121.1
	74	112.3
14″WF 14″x10″	68	103.0
	61	92.2
	58	85.0
14″WF 14″x8″	53	77.8
	48	70.2
	43	62.7
	42	60.7
14″WF 14″x6¾″	38	54.6
	34	48.5
	30	41.8
	190	263.2
	176	242.6
	161	222.2
	147	201.8
	133	182.5
	120	163.4
12″WF 12″x12″	106	144.5
	99	134.7
	92	125.0
	85	115.7
	79	107.1
	72	97.5
	65	88.0
	64	85.8
12″WF 12″x10″	58	78.1
	53	70.7
12″WF 12″x8″	50	64.7
	45	58.2
	40	51.9
	36	45.9
12″WF 12″x6½″	32	40.7
	28	35.6
	25	30.9
	22	25.3
12″BL 12″x4″	19	21.4
	16½	17.5
	136	154.4
	124	139.9
	112	126.3
	100	112.4
	89	99.7
10″WF 10″x10″	77	86.1
	72	80.1
	66	73.7
	60	67.1
	54	60.4
	49	54.6
	45	49.1
10″WF 10″x8″	41	44.5
	37	39.9
	33	35.0
10″WF 10″x5¾″	29	30.8
	26	27.6
	23	24.1
	21	21.5
10″BL 10″x4″	19	18.8
	17	16.2
	15	13.8
	67	60.4
	58	52.0
8″WF 8″x8″	48	43.2
	40	35.5
	35	31.1
	33	29.3
	31	27.4
8″WF	27	23.4
8″x6½″	24	20.8
8″WF 8″x5¼″	21	18.0
	19	16.0
	17	14.1
8″BL	15	11.8
8″x4″	13	9.88
	27½	18.0
	25	16.4
6″WF 6″x6″	22½	14.8
	20	13.1
	18	11.5
	15½	9.7
	88	59.5
	80	53.8
B6a 6″x10″	70	46.9
	60	40.0
	50	33.2
	40	26.3
	18½	9.94
5″WF	16	8.53
	13½	7.02
6″BL	16	10.1
6″x4″	12	7.24
12″BJ	14	14.8
10″BJ	11½	10.5
8″BJ	10	7.79
6″BJ	8½	5.07
5″BS	18.9	9.5
5″x5″		
4″BS	13	5.45
4″x4″	10	4.16
	7½	3.13
7″B	12	8.5
6″B	10	5.9

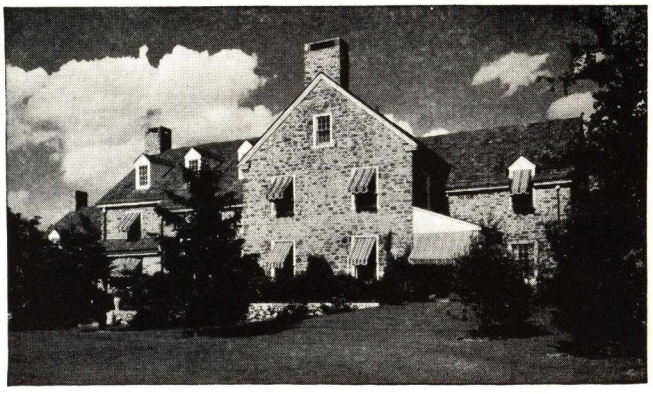
*Dimensions following section number are nominal over-all height and width of flange, respectively.

BETHLEHEM LIGHT SECTIONS

Beams, columns, joists and stanchions, rolled exclusively from open hearth steel, structural grade, to essentially the same shapes as the heavier wide-flange sections.

Although light in weight for their depths, Bethlehem Light Sections have sufficient thickness of metal in both flange and web to make them suitable for use in first class construction, and within the requirements of the building laws of large cities.

Bethlehem Light Sections find wide application in the construction of apartment houses, school buildings, hospitals, hotels and similar structures having relatively light live loads.



Residence, Bethlehem, Pa.

C. M. Lovelace and Otto Spillman, Architects and Engineers
F. F. Speck Construction Co., General Contractors
Bethlehem Fabricators, Inc., Fabricators

Advantages

These light sections supplement the heavier Bethlehem Wide-Flange Structural Shapes, and as such afford architects and engineers greater latitude in working out economical designs.

The light structural joists together with stanchions, forming an integral part of the steel frame, offer economy in design without loss in rigidity.

Being erected in the same manner as the heavier sections, they can be handled by the same contractor or fabricator who has the complete job.

Bethlehem Light Joists will support loads, such as forms for floor slabs, before the floor is in place.

Wherever thicker floor slabs are desired, Bethlehem Light Sections can be used to advantage, because the width of the flanges permits greater spans, and the inherent strength of the sections permits greater spacing, than with other types of light sections.

Economies

The use of Bethlehem Light Sections effects definite economies. In floors of depth sufficient to provide the requisite rigidity, they can be set close enough together to keep the floor slab thickness within economical limits without using a greater weight of steel than is needed to carry the load.

Similar savings are obtained through the use of these sections as purlins in roof construction, as columns in upper stories where loads are lighter, as struts between columns—in fact, wherever it is desirable to combine rigidity with relatively close spacing of the structural members in floors and roofs.

Light Sections Were Used in Knickerbocker Village, New York, N. Y.

John S. Van Wart, Architect Alexander D. Crosett, Engineer Fred F. French Company, General Contractors
Harris Structural Steel Co., Fabricators

BETHLEHEM STEEL COMPANY

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FABRICATED STEEL WORK

Facilities

With both the steel manufacturing and construction divisions fully co-ordinated into a smooth-running organization, Bethlehem, as the largest steel construction company in the world, is in a unique position to build steel structures of every size and description with maximum speed and efficiency.

The wide variety of structures listed below suggests the magnitude and range of service Bethlehem is equipped to render.

Buildings

Public Buildings, Office, Mill, Factory and Industrial Buildings; Hotels and Apartment Houses; Grandstands and Auditoriums; Power Plants, Pier and Train Sheds; Freight Depots and Terminals; Docks and Piers; Steel Frame Buildings of all descriptions.

Bridges

Highway Bridges, Trestles, Suspension Bridges, Viaducts, Ore Bridges; Bascule, Swing and Lift Bridges; Railroad Locomotive Turntables.

Tanks

Oil Storage Tanks, Gasoline Station Tanks, Brewery Tanks, Elevated Water Tanks, Surge Tanks, Standpipes.

Towers

Transmission Poles and Towers, Radio Masts and Towers, Floodlight Towers, Water Cooling Towers.

Gas Plant Equipment

Gas Holders; Pressure Holders, Gas Purifiers and Scrubbers; Gas Condensers.

Oil Refinery and Chemical Plant Equipment

Petroleum Refining Plants, Agitators, Condensers, Gasoline Absorbers, After-coolers, Autoclaves, Pans, Stills, Cylinders, Dye Kettles, Nitrators; Acid and Absorbing Towers.

Steel Structural Work

Coal Storage Plants, Galvanizing Works, Coal Tipples, Coal Bins, Head Frames, Bridge Caissons, Derricks.

Steel Plate Work and Construction

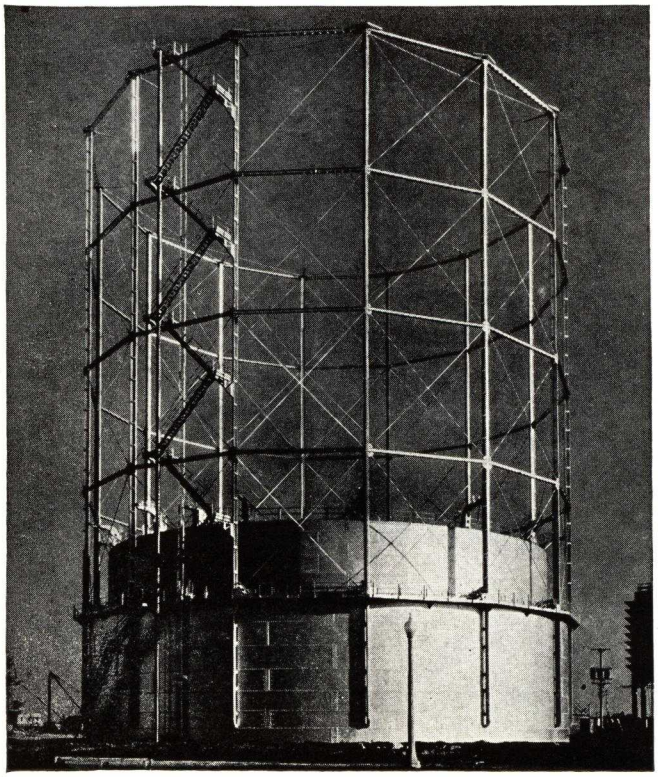
Boxes, Bins, Boiler Breechings, Chimneys, Chutes, Sheet Steel Caissons, Creosoting Cylinders, Hydraulic Accumulators and Cylinders, Digesters, Hoppers, Galvanizing Kettles, Cement Kilns, Foundry Ladles; Annealing, Drying and Evaporating Pans, Smokestacks, Rotary Driers and Kilns, Mixers.

Barges and Hulls

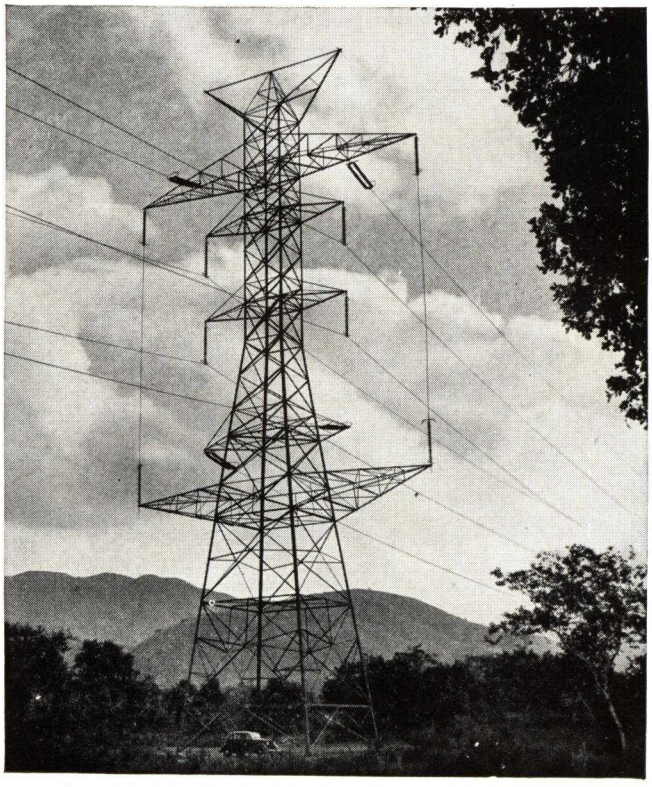
Steel Barges, Pontoons, Boat Hulls, Car Floats, Dredges.

Pipe

Welded Pipe, Steel Dredge Pipe, Pontoon Pipe, Underground Conduit, Riveted Steel Pipe Lines of large diameter, Flumes, Penstocks.



Helium Gas Holder, U. S. Navy, Sunnyvale, Calif.



Transposition Tower, Boulder Canyon Transmission Line

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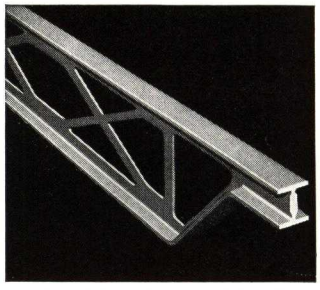
For Other Bethlehem Pages, see File Index

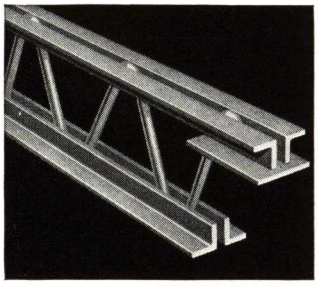
OPEN WEB STEEL JOISTS AND EXPANDED STEEL STUDS

Bethlehem Steel Joists, Longspan Joists, Rigid Bridging, Bethlehem Steel Studs, and Accessories.

STEEL JOISTS



Bethlehem Expanded Steel Joist—End View

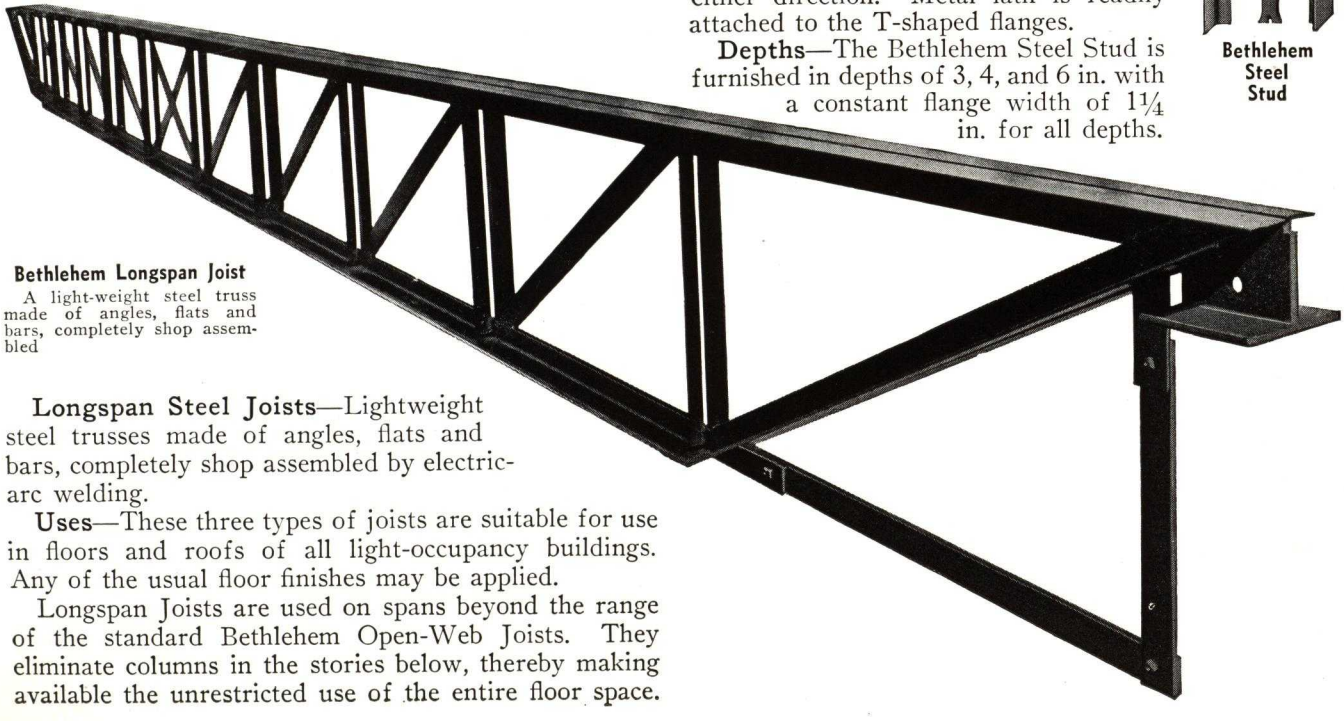


Bethlehem Welded Steel Joist—End View

Bethlehem manufactures three types of steel joists; these are:

Bethlehem Expanded Steel Joists—Expanded one-piece light-weight steel trusses, made from one solid piece by a continuous hot slitting and rolling process.

Bethlehem Welded Steel Joists—Steel trusses composed of angle chords and continuous bar web and assembled by the pressure-welding method.



Bethlehem Longspan Joist
A light-weight steel truss made of angles, flats and bars, completely shop assembled

Longspan Steel Joists—Lightweight steel trusses made of angles, flats and bars, completely shop assembled by electric-arc welding.

Uses—These three types of joists are suitable for use in floors and roofs of all light-occupancy buildings. Any of the usual floor finishes may be applied.

Longspan Joists are used on spans beyond the range of the standard Bethlehem Open-Web Joists. They eliminate columns in the stories below, thereby making available the unrestricted use of the entire floor space.

In combination with concrete floor slabs and plastered ceilings, they provide rigid, permanent fire-safe construction at moderate cost.

Depths—Bethlehem Joists—8 to 16 in., varying by 2-in. steps. Longspan Joists—18 to 32 in., varying by 2-in. steps.

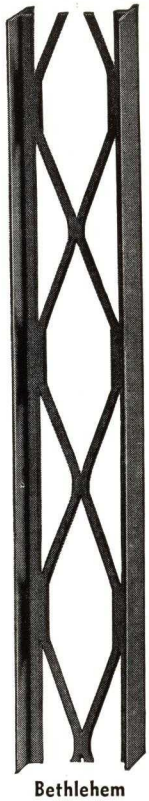
Clear Spans—Bethlehem Joists—up to 32 ft. Longspan Joists—up to 64 ft.

STEEL STUDS

Bethlehem Steel Studs are one-piece, load-bearing members made by continuous hot-slitting and rolling processes. They find application in partitions in all types of fireproof construction, and especially in exterior walls and interior bearing walls of dwellings and other light-occupancy structures.

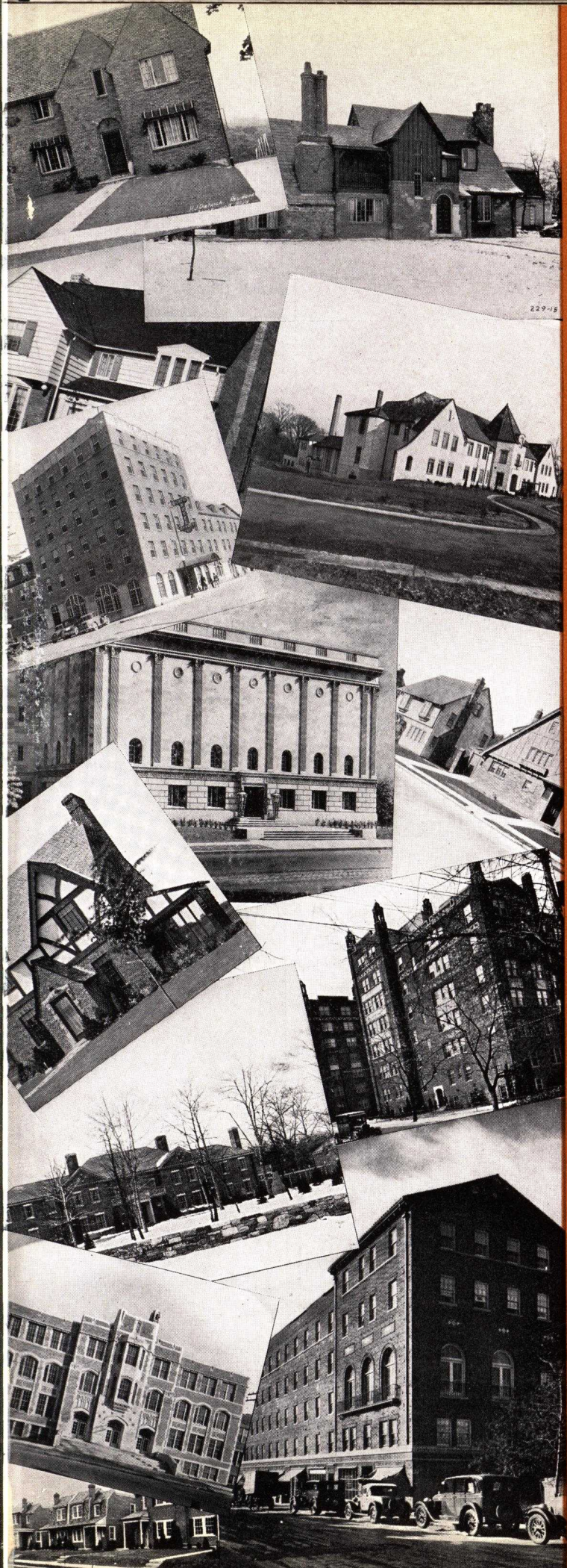
Combined with metal lath and plaster, the Bethlehem Steel Stud provides a partition that is economical to build, light in weight, non-shrinking, and soundproof. It may be used as exterior wall material in connection with stucco or masonry veneer. Piping and conduit are run freely within the hollow wall or partition, in either direction. Metal lath is readily attached to the T-shaped flanges.

Depths—The Bethlehem Steel Stud is furnished in depths of 3, 4, and 6 in. with a constant flange width of 1¼ in. for all depths.



Bethlehem Steel Stud

MEMORANDA



J & L

JUNIOR BEAM FLOORS

FOR

RESIDENCES

SCHOOLS

AND

OTHER LIGHT OCCUPANCY BUILDINGS

JONES & LAUGHLIN STEEL CORPORATION
AMERICAN IRON AND STEEL WORKS
PITTSBURGH.

J & L JUNIOR BEAMS FOR GENERAL CONSTRUCTION

THE J & L JUNIOR BEAM is the lightest rolled structural steel I-beam now available and was designed to provide the building industry with sections which would make possible new economies in practically all types of construction. That this object has been accomplished has been proved in hundreds of buildings ranging from small residences to large schools, stores, apartments, hospitals and many other light occupancy structures.

The Junior Beam is made of structural grade steel rolled from the billet to the full I-section in a continuous mill with but slight change in temperature from the reheating furnace to the cooling bed.

The function of the Junior Beam used as a floor beam or roof purlin is to carry the live and dead loads and transfer them to the heavier main carrying members of the frame work or to the supporting walls.

The data on the following pages are divided into two sections for convenience of use and because certain requirements govern the design and use of Junior Beams in general construction which do not apply when they are used in residences. The first section contains engineering design data and tables which the architect, engineer and contractor will use for buildings other than residences. Loads, spacings, end connections and floor and ceiling construction data affect the design in such buildings. The second section relates primarily to the layout and construction of floors for residences for which the design is less complicated and the plan usually involves fewer details and more simple construction.

Advantages of J & L Junior Beam Floors

The J & L Junior Beam Floor offers the architect and contractor many advantages. Some of these are suggested below and others will occur to the reader as he studies the data in this catalog.

Unusual economies due to the light weight of the floors and the consequent saving in main frame and foundations.

No shoring is necessary to place the concrete slabs. This reduces costs and permits workmen to install partitions, plumbing, and to do steam fitting, etc., without waiting for removal of the shoring.

Walls can be erected as soon as the steel is placed.

Junior Beams are carried in stock and are available without delay.

Jones & Laughlin Service

Jones & Laughlin District Sales Offices are situated in all important centers. J & L engineers familiar with J & L Junior Beams and their uses are available in these offices for advice and assistance.

When you desire to have detailed information in connection with the design of J & L Junior Beams, please ask the nearest office for Bulletin which contains all such data.

The JONES & LAUGHLIN STEEL CORPORATION offers, also, the aid of skilled field engineers to service any particular building operation in which Junior Beams are used.

JONES & LAUGHLIN STEEL CORPORATION
American Iron and Steel Works
PITTSBURGH, PENNSYLVANIA
For List of Sales Offices, Warehouses and Fabricating Plants—See Back Cover

ENGINEERING DATA ON J & L JUNIOR BEAMS FOR GENERAL CONSTRUCTION

Junior Beams are homogeneous steel I-sections in their original symmetrical form as rolled and, as such, can be used in structural design up to their full value by employing standard engineering formulae and without empirical assumptions.

Official Classification of Junior Beams

Junior Beams are extensively used throughout the United States and Canada in floor systems, the carrying capacity being based on the same fiber stress as that of standard weight structural steel sections.

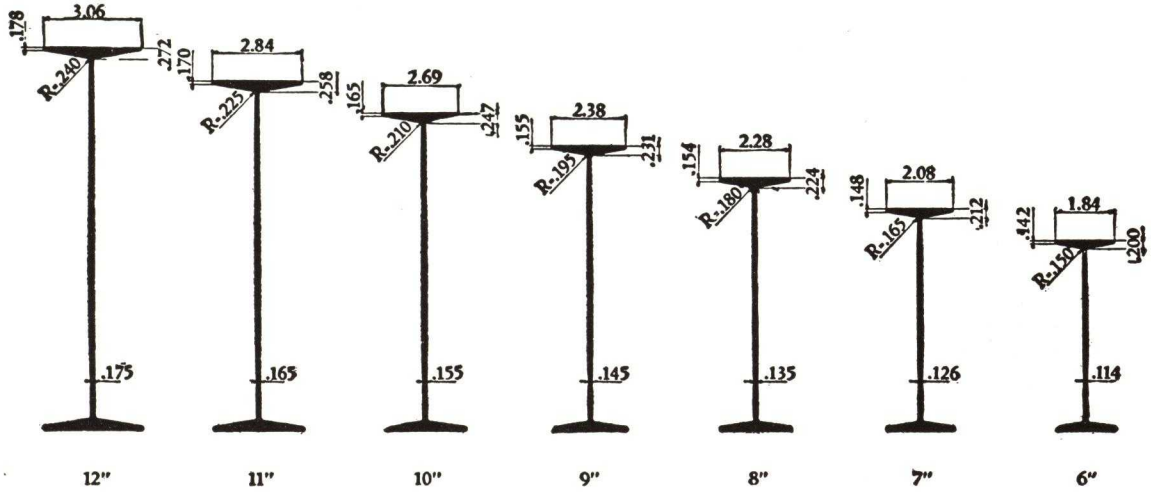
J & L Junior Beams are rated as structural steel by the American Institute of Steel Construction and their properties and dimensions are included in the handbook of information published by the Institute.

Uses for Junior Beams and General Construction

The principal use of Junior Beams is as secondary members in floor and roof construction of buildings. They are also being used in increasing quantities as purlins, rafters and girts for mill and hangar buildings, ceiling supports over auditoriums, protection sheds and scaffolding, monorails, supports for conveying and mechanical equipment, and all classes of structural work where, due to their light weight, they are the most economical sections to be used.

The adaptability of Junior Beams to floor construction provide many economies due to light weight of floor and ease of erection. A floor containing the least amount of steel, concrete and labor can be designed by judicious combination of companion materials. It is advantageous to utilize in good designs, the actual strength of properly proportioned thin concrete slabs by spacing Junior Beams to their capacity and also where practicable, designing the Junior Beams as continuous spans. The floor will be light, rigid, and have a minimum amount of deflection. It will be quickly erected, firesafe and soundproof. Precast gypsum slabs and other lightweight materials are also employed in obtaining similar economies.

Sizes, Weights and Properties of J & L Junior Beams



Depth, in.	Weight, lbs. per ft.	Flange width, in.	Web thickness, in.	Area, sq. in.	Radius of gyration		Moment of inertia		Section modulus	
					Hor. axis	Vert. axis	Hor. axis	Vert. axis	Hor. axis	Vert. axis
12	11.8	3.06	0.175	3.45	4.573	0.532	72.21	0.978	12.01	0.638
11	10.3	2.84	.165	3.01	4.200	.498	53.08	.746	9.63	.525
10	9.0	2.69	.155	2.64	3.847	.480	39.01	.608	7.78	.452
9	7.5	2.38	.145	2.20	3.450	.423	26.20	.394	5.81	.332
8	6.5	2.28	.135	1.92	3.116	.423	18.67	.343	4.65	.301
7	5.5	2.08	.126	1.61	2.744	.393	12.13	.248	3.45	.239
6	4.4	1.84	.114	1.30	2.372	.357	7.30	1.65	2.42	.179

TABLE OF SPACINGS

TOTAL SAFE LOADS FOR J & L JUNIOR BEAMS

FIBER STRESS—18,000 POUNDS PER SQUARE INCH

Span of Beam	Depth of Beam	Total Safe Uniform Load on Beam Pounds	TOTAL LOAD PER SQUARE FOOT and SPACING OF JUNIOR BEAMS IN INCHES															
			50 Lb.	60 Lb.	70 Lb.	80 Lb.	85 Lb.	90 Lb.	95 Lb.	100 Lb.	105 Lb.	110 Lb.	115 Lb.	120 Lb.	130 Lb.	140 Lb.	150 Lb.	160 Lb.
26′-0″	12″	5542	51	42½	36½	32	30	28½	27	25½	24½	23	22	21	19½	18	17	16
25′-0″	12″	5764	55	46	39½	34½	32½	30½	29	27½	26½	25	24	23	21	19½	18½	17
24′-0″	12″	6004	60	50	43	37½	35½	33½	31½	30	28½	27	26	25	23	21½	20	18½
	11″	4815	48	40	34	30	28	26½	25	24	23	22	21	20	18½	17	16	15
23′-0″	12″	6265	65	54½	46½	41	38½	36½	34	32½	31	29½	28½	27	25	23	21½	20½
	11″	5024	52	43½	37½	32½	31	29	27½	26	25	23½	22½	21½	20	18½	17½	16
22′-0″	12″	6549	71	59½	51	44½	42	39½	37½	35½	34	32½	31	29½	27½	25½	23½	22½
	11″	5253	57	47½	41	36	33½	31½	30	28½	27	26	25	24	22	20½	19	18
	10″	4244	46	38½	33	29	27	25½	24½	23	22	21	20	19	18	16½	15½	14½
21′-0″	12″	6861	78½	65½	56	49	46	43½	41½	39	37½	35½	34	32½	30	28½	26	24½
	11″	5503	63	52½	45	39½	37	35	33	31½	30	28½	27	26	24	22½	21	19½
	10″	4446	51	42½	36½	32	30	28	26½	25½	24	23	22	21	19½	18	17	16
20′-0″	12″	7204	86½	72	61½	54	51	48	45½	43	41½	39	37½	36	33	31	29	27
	11″	5778	69½	57½	49½	43	41	38½	36½	34½	33	31½	30	29	26½	25	23	21½
	10″	4668	56	46½	40	35	33	31	29½	28	26½	25½	24	23	21½	20	18½	17½
	9″	3486	42	35	30	26	24½	23	22	21	20	19	18	17½	16	15	14	13
19′-0″	12″	7584	96	80	68½	60	56½	53½	50½	48	45½	43½	41½	40	37	34½	32	30
	11″	6082	77	64	55	48	45	42½	40½	38½	36½	35	33½	32	29½	27½	25½	24
	10″	4914	62	51½	44½	38½	36	34½	32½	31	29½	28	27	26	24	22	20½	19½
	9″	3670	46½	38½	33	29	27	25½	24½	23	22	21	20	19½	18	16½	15½	14½
18′-0″	12″	8005	107	89	76	67	63	59½	56½	53½	51	48½	46½	44½	41	38	35½	33½
	11″	6420	85½	71½	61	53½	50½	47½	45	43	41½	39	37	35½	33	30½	28½	26½
	10″	5187	69	57½	49½	43	40½	38½	36½	34½	33	31½	30	29	26½	24½	23	21½
	9″	3874	51½	42	37	31½	29½	28	26½	25	24	23	22	21½	19½	18	17	16
	8″	3101	41½	34½	29½	26	24½	23	22	20½	19½	18½	18	17	16	14½	14	13
17′-0″	12″	8476	120	100	85½	75	70½	66½	63	60	57	54½	52	50	46	42½	40	37½
	11″	6797	96	80	68½	60	56½	53½	50½	48	45½	43½	41½	40	37	34½	32	30
	10″	5492	77½	64½	55½	48½	45½	43	41	39	37	35	33½	32	30	27½	26	24
	9″	4102	58	48	41½	36	34	32	30½	29	27½	26½	25	24	22	20½	19½	18
	8″	3283	46½	38½	33	29	27	25½	24½	23	22	21	20	19½	18	16½	15½	14½
16′-0″	11″	7222	108	90	77½	67½	64	60½	57	54	51½	49	47	45	41½	39	36	34
	10″	5836	87½	73	62½	54½	51½	48½	46	44	41½	40	38	36½	33½	31	29	27
	9″	4358	65	54½	46½	40½	38	36	34	32½	31	29½	28½	27	25	23	21½	20½
	8″	3489	52½	43½	37	33	31	29	27½	26	25	24	22½	21½	20	18½	17½	16½
	7″	2589	39	32	27½	24	23	21½	20½	19½	18½	17½	17	16	15	14	13	12
15′-0″	11″	7704	123	102½	88	77	72½	68½	65	61½	58½	56	53½	51½	47½	44	41	38½
	10″	6225	100	83	71	62½	58½	55½	52½	50	47½	45	43½	41½	38½	35½	33	31
	9″	4648	74½	62	53	46½	44	41½	39	37	35½	34	32	31	28½	26½	24½	23
	8″	3721	59½	49½	42½	37	35	33	31½	30	28½	27	26	25	23	21	20	18½
	7″	2762	44	37	31½	27½	26	24½	23	22	21	20	19	18½	17	15½	14½	13½
14′-0″	10″	6669	114	95	81½	71½	67	63½	60	57	54½	52	49½	47½	44	41	38	35½
	9″	4981	85½	71	61	53½	50	47½	45	42½	41½	39	37	35½	33	30½	28½	26½
	8″	3987	68½	57	49	42½	40	38	36	34	32½	31	29½	28½	26	24½	22½	21½
	7″	2959	51	42	36½	32	30	28	26½	25½	24	23	22	21	19½	18	17	16
	6″	2077	35½	29½	25½	22	21	20	18½	18	17	16	15½	14½	13½	12½	12	11
13′-0″	10″	7182	132	110	95	83	78	74	70	66	63½	60	57½	55	51	47½	44	41½
	9″	5364	99	82½	71	62	58½	55	52	49½	47	45	43	41	38	35	33	31
	8″	4294	79½	66	56½	49½	46½	44	41½	39½	38	36	34½	33	30½	28	26½	24½
	7″	3187	59	49	42	37	34½	32½	31	29½	28	26½	25½	24½	22½	21	19½	18½
	6″	2236	41½	34½	29½	25	24	23	21½	20½	19½	18½	18	17	16	14½	13½	13
12′-0″	9″	5811	116	96½	83	72½	68	64½	61½	58	55½	53	50½	48½	44½	41½	38½	36
	8″	4651	93	77½	66½	58	55	51½	49	46½	44½	42	40½	39	36	33	31	29
	7″	3452	69	57½	49	43	40½	38½	36	34½	33	31½	30	28½	26½	24½	23	21½
	6″	2423	48½	40½	34½	30	28½	27	25½	24	23	22	21	20	18½	17	16	15
11′-0″	9″	6339	138	115	99	86½	81½	77	73	69	66	63	60	57½	53	49½	46	43
	8″	5074	111	92	79	69	65½	61½	58½	55½	52½	50	48	46	42½	39½	37	34½
	7″	3766	82	68½	59	51	49	45½	43½	41	39	37	35½	32½	31½	29½	27	25½
	6″	2643	57½	48	41	36	34	32	30½	29	27½	26	25	24	22	20½	19	18
10′-0″	8″	5582	134	111	96	84	79	74½	70½	67	64	61	58	56	51½	48	45	42
	7″	4143	99	82½	71	62	58	55	52	49½	47	45	43	41½	38	35½	33	31
	6″	2907	69½	58	50	43½	41	39	36½	35	33	31½	30½	29	27	25	23	21½
9′-0″	7″	4603	123	102	87½	76½	72	68	64½	61½	58½	56	53	51	47	44	41	38
	6″	3230	86	71½	61½	53½	50½	48	45	43	41	39	37½	36	33	31	29	27
8′-0″	7″	5178	155½	129½	111	97	92	86½	82	77½	74½	70½	67	64½	59½	55½	51½	48½
	6″	3634	109	91	78	68	64	60½	57½	54½	52	49½	47½	45½	42	39	36	34

* In designing Junior Beam Floors, bear in mind that the use of the deepest Junior beam at the widest spacing will provide a floor having the least amount of steel per square foot.

END CONNECTIONS FOR J & L JUNIOR BEAMS

The illustrations at the right show the method of framing Junior Beams to a steel frame with clip angles, and details of the standard Junior Beam end connection.

Clip Angle End

Figs. 1 and 2 show how Junior Beams are framed to the main carrying members by use of one clip angle at each end of the Junior Beam. The Junior Beams and carrying beams are merely punched before shipment. The clip angles may be shipped loose, or bolted to either the Junior Beams or to the primary members, as desired.

Standard End

Figs. 3, 4 and 5 show details of the J & L standard Junior Beam end. The end is composed of two angles riveted back to back on the Junior Beam. In all three of these sketches, the top of the Junior Beams are $2\frac{1}{2}$ in. above the supporting structural members.

Fig. 3 shows the standard end for 6″, 7″ and 8″ Junior Beams.

Fig. 4 shows the standard end for 9″ and 10″ Junior Beams.

Fig. 5 shows the standard end for 11″ and 12″ Junior Beams.

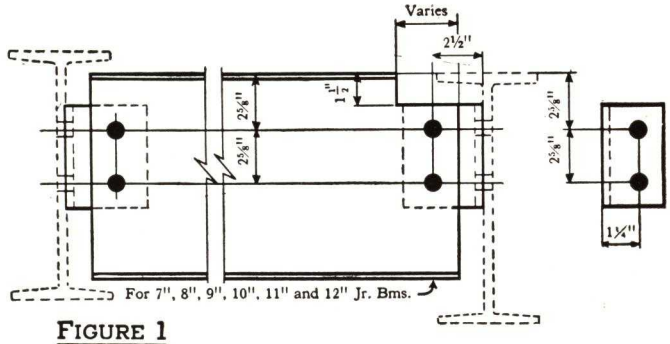


FIGURE 1

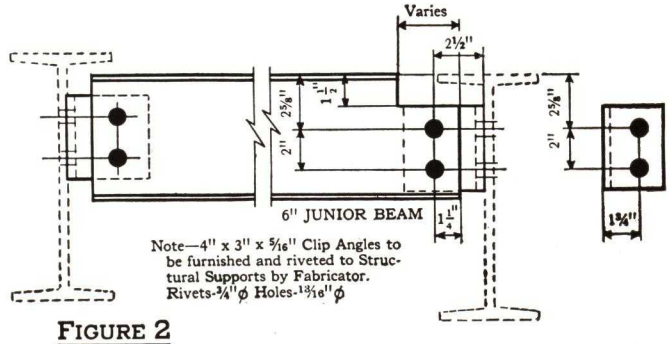


FIGURE 2

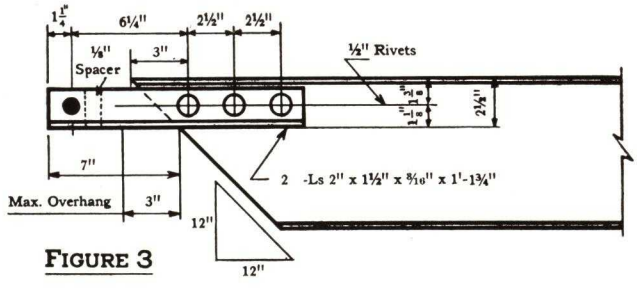


FIGURE 3

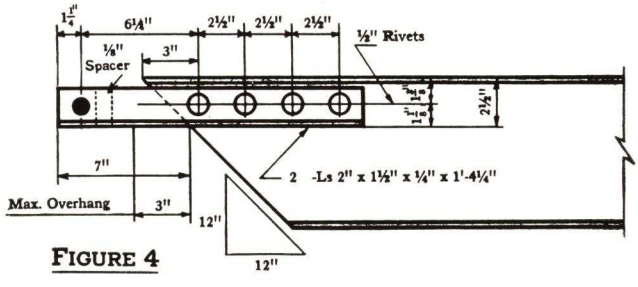


FIGURE 4

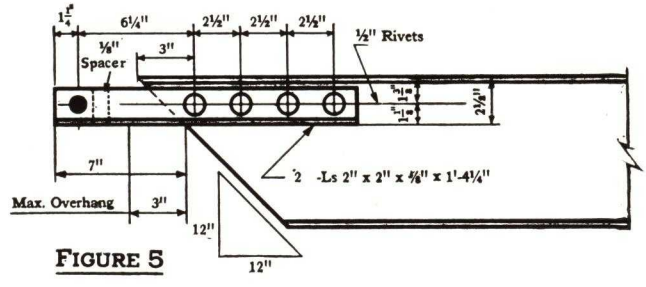
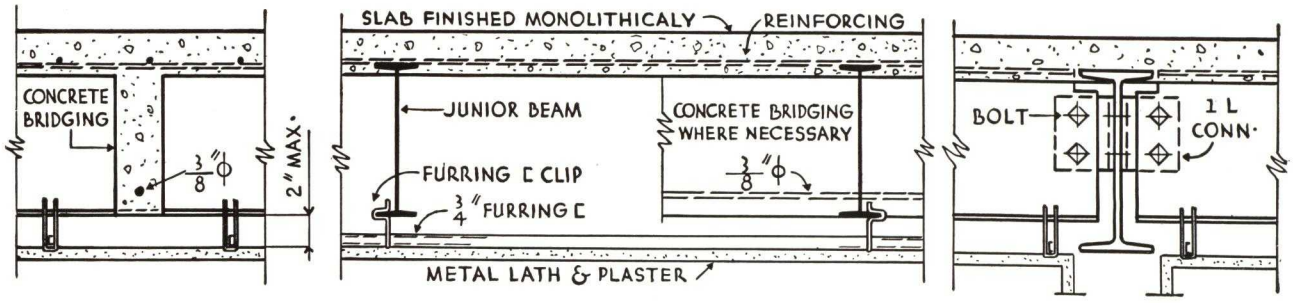


FIGURE 5

J & L JUNIOR BEAMS FLOORS IN GENERAL CONSTRUCTION

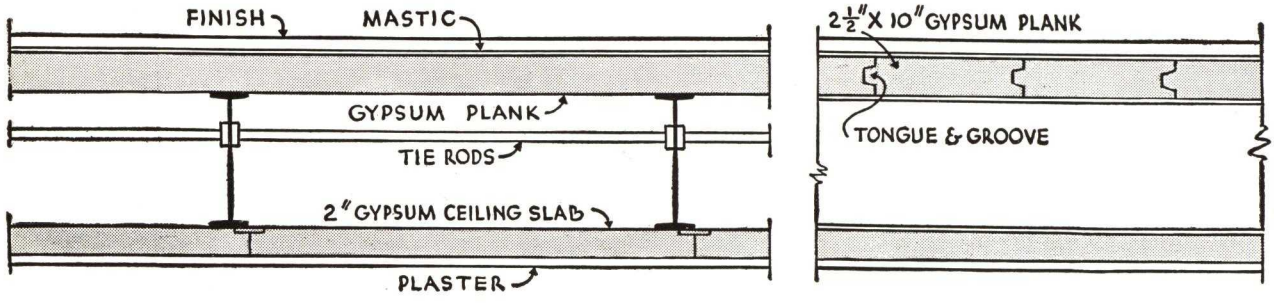
Monolithically-Finished Concrete Floor



Where possible the Junior Beams are made continuous over three supports or more.

By encasing the top flanges, the floor is made rigid and does not require bridging in light occupancy buildings. Where concentrated loads must be transferred over two or more beams, it is done by the use of concrete bridging poured monolithically with the slab. The slab is poured on a simple form, of either wood or metal. If wood is used, the beams can be spaced so that ripping of form boards is avoided. Clips are furnished for fastening the ceiling furring channels to the bottom flanges, allowing 2 in. of space to the bottom of the channels in which to run electrical conduits. This is the most economical quality floor that can be built.

Gypsum Slabs

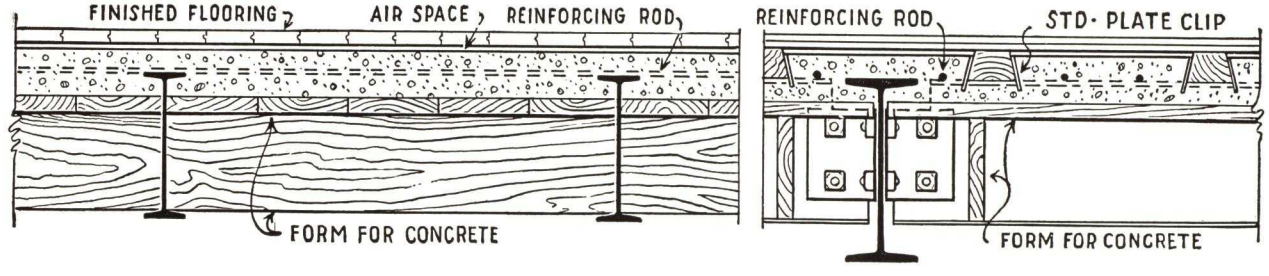


The lightest type of floor providing four-hour fire protection is obtained by the use of precast gypsum floor planks and ceiling slabs, securely fastened to the Junior Beams by means of clips and hangers.

The floor planks are furnished in lengths 6 ft. 0 in. to 10 ft. 0 in. and the Junior Beams spaced to accommodate the required loading.

This floor is quickly erected and due to the light weight, effects considerable economy in the main steel frame and foundations.

Wood Form — Concrete Slab — Wood Floor



This type of Junior Beam floor is easy to install and is especially satisfactory. When 8 in. Junior Beams are used, the spreaders (vertical boards supporting form) will be 1 in. by 6 in. The form is constructed of ordinary sheathing. The reinforcing is ¼ in. rods, 6 in. to 8 in. o. c., and the wooden sleepers, fastened to the top flanges of the Junior Beams with standard plate clips, are spaced 12 in. to 16 in. o. c. No bridging is necessary as the concrete slab engages and holds rigidly the top flanges of the steel. Plaster ceiling is applied in the same manner shown at top of page in details of monolithically-finished concrete floor.

SPECIFICATIONS FOR J & L JUNIOR BEAMS IN GENERAL CONSTRUCTION

Architects and engineers should include Junior Beams in the structural steel section of specifications, as they are an integral part of the structural framework of the building, to be supplied by the structural steel contractor. This procedure insures proper co-ordination of design and detail under one engineering control and also proper timing of arrival of all structural material to the site and erection by the same erector.

The following specifications have been developed with the idea that they will aid designers in properly specifying J & L Junior Beams. Specifications may be used either in whole or in part with absolute confidence; they represent the best thought and standard practice at the present time.

Description—The structural part of the floor system shall consist of the slab supported on Jones & Laughlin Junior Beams, acting as secondary members of dimensions as shown on drawings. Before shipment, all J & L Junior Beams shall be given a coat of paint.

Partitions—Proper provision shall be made in the loading for the weight of partitions.

Bridging—The J & L Junior Beam shall be bridged as shown on the drawings with (tension compression) (tie rod) (solid concrete crossbeam) (12½ gauge wire). Where wire or tie rod bridging is used, the end Junior Beam in each panel shall be fastened to bridging anchors set in outside wall or to parallel structural steel.

Wall Plates—Standard Junior Beam wall plates shall be used under the ends of Junior Beams resting on bearing walls.

Anchors—Where Junior Beams rest on masonry walls, a ½ in. by 8 in. round anchor shall be used (in such Junior Beams as the local building code requires).

Sleepers—Where wood floors on top of concrete slabs attached to sleepers are specified, the sleepers shall be preferably of hardwood, embedded in the slab. Sleepers shall be attached to the tops of Junior Beams by means of proper clips. Sleepers shall be run (at right angles to the Junior Beams and be spaced . . . in. apart) (diagonally to the Junior Beams). Substitution may be made for the above, dependent upon the type of floor system under consideration.

Floor Slabs—Concrete floor slabs shall be designed to suit the loading and spacing of Junior Beams. The slabs shall be poured on (self-centering lath) (paper-backed fabric) (removable forms). The concrete shall be composed of one part cement and a graded mixture consisting of not more than seven parts of fine and coarse aggregate. Where the slab is poured on lath, it shall be mixed sufficiently dry to prevent dripping. Where the slab is poured on removable forms, the maximum size of the aggregate shall be ½ in. and the concrete shall be of a consistency which will allow it to encase the beam flanges and flow under the wood sleepers. Where floor slabs of other material than concrete are used, they shall be designed to carry the specified loading in accordance with manufacturer's specifications.

Permanent Centering—Lath shall be applied with sheets running at right angles to the Junior Beams. Metal lath shall be securely fastened to the tops of the Junior Beams with lath clips on 12 in. centers, except at ends of sheets where lath clips shall be at 6 in. centers, and applied with a special tool furnished by the manufacturers of the J & L Junior Beams. Lath sheets shall be securely wired together along the side laps midway between Junior Beams. Any approved form of metal lath or backed floor fabric may be used. Any and all clips, ties, or other accessories necessary for the proper application of each particular type of centering shall be used in accordance with these specifications or the specifications of the manufacturer of the respective centering materials. The writer of the specifications shall define the type and quality of the centering to meet the particular requirements.

Removable Forms—Either wood or steel forms may be employed, placed so that the compression flange of the Junior Beams will be embedded. Where a plaster ceiling is not used and appearance is a factor, there should be a minimum of ¾ in. embedment of top flange. Standard practice regarding the use of shoreless forms will obtain.

Temperature and Shrinkage Reinforcing—When finished floors are made of composition, terrazzo or materials other than wood, provisions shall be made for proper size of steel reinforcing.

Ceiling Lath—Ceiling lath, covered elsewhere under plastering specifications shall be firmly wired to (pencil rods) (furring channels) which in turn shall be securely fastened to the bottom flanges of the Junior Beams by means of approved clips. Use of J & L furring clip to obtain proper space for conduits is recommended.

Where the spacings of the Junior Beams are narrow, flat or ribbed lath may be fastened directly, by means of an approved clip, to the lower flanges of the Junior Beams. Ribbed lath shall be applied so that the ribs are at right angles to the direction of the pencil rods, or, when pencil rods are omitted, to Junior Beams.

HANGERS AND ACCESSORIES FOR J & L JUNIOR BEAMS

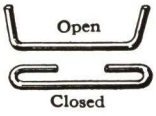
BEAM ANCHOR

For use in anchoring Junior Beams in masonry wall. This anchor is supplied in one size only, as shown. Requires a 13/16 in. hole punched in center of web of Junior Beam, 2 in. from end.

WALLBEARING PLATE

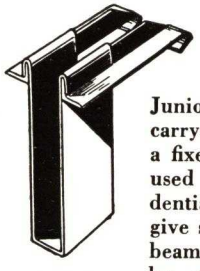
Holds Junior Beam steadily in vertical position during erection. Made in seven sizes, one for each Junior Beam. When ordering, specify depth of Junior Beams.

LATH CLIP

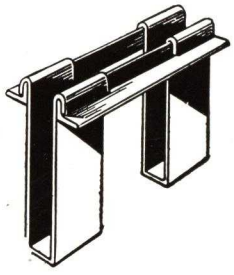


For attaching metal lath to either top or bottom flanges of Junior Beams. Made in seven sizes, one for each Junior Beam. When ordering, specify depth of Junior Beams.

STANDARD STIRRUP HANGERS



Single



Double

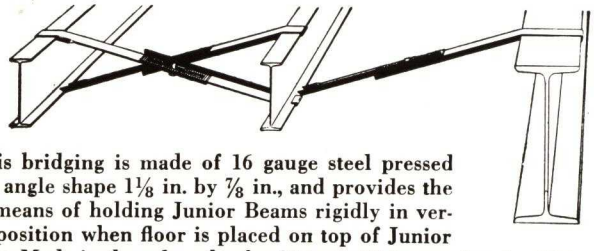
Single: For supporting one Junior Beam at right angles to another Junior Beam or structural carrying beam. This is not a fixed connection and is used principally in residential floors. In ordering, give size of both carrying beam and Junior Beam to be supported. For use where top flanges of beams are to be flush.

Double: For use as above where Junior Beams are opposite each other and supported by one primary member.

STANDARD PLATE CLIP FOR SLEEPERS

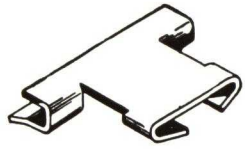
This plate clip is used for fastening sleepers to top flanges of Junior Beams. It is also used for fastening ceiling screeds to bottom flanges of Junior Beams.

RIGID BRIDGING



This bridging is made of 16 gauge steel pressed to an angle shape 1⅛ in. by ⅞ in., and provides the best means of holding Junior Beams rigidly in vertical position when floor is placed on top of Junior Beams. Made in three lengths, for 12 in. to 20 in. spacing, for 20 in. to 30 in. spacing and for 30 in. to 36 in. spacing. In ordering, give number of pairs required and spacing of Junior Beams. Wire Bridging can be used as an alternate in certain localities.

TOP FLANGE CLAMP



To be attached to top flanges of Junior Beams when Junior Beams rest on shelf angles. A similar clamp is furnished for attachment to the bottom flange of Junior Beams when Junior Beams rest on top of structural members. The latter clamp has an offset equal to the thickness of the flange of the structural member. These clamps hold Junior Beam steadily in vertical position during erection.

SCREED CHAIRS

Type R

Type P

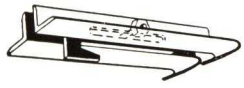
To be used in association with metal lath and concrete construction.

Type R—To be used when the sleeper is placed at right angles to the Junior Beams. Sleepers are held securely by nails through loops in sides of chair.

Type P—For use as above when sleepers run parallel with Junior Beams.

STANDARD ADJUSTABLE ANGLE HANGERS

Double



Single

Double: This connection used principally in residential floors, may be used to support Junior Beams at right angles to and on top of main carrying member. Junior Beams project 2½ in. above top flange of main carrying member. Ends of Junior Beams must be cut at an angle of 45 degrees.

Single: To be used under same conditions as double hangers, but to support Junior Beam on only one side of main carrying member.

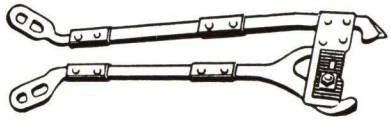
REINFORCING ROD CLIP

For attaching ¼ in. reinforcing rods to either top or bottom flanges of Junior Beams.

FURRING CHANNEL CLIP

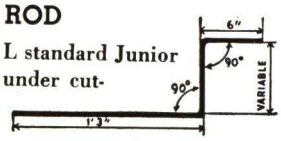
For attaching furring channels to bottom flanges of Junior Beams to provide for plastered ceiling. This clip is supplied in four sizes: ¾ in., 1 in., 1½ in. and 2 in. In ordering, specify size required.

LATH CLIP TOOL



Used for crimping standard lath clips on flanges of Junior Beams.

CEILING EXTENSION ROD



To be used in connection with J & L standard Junior Beam end. This rod carries ceiling under cut-out end of Junior Beam.

BRIDGING ANCHOR

To be used at end of a run of wire bridging. Anchor in wall and attach to both top and bottom flanges of Junior Beam.

J & L JUNIOR BEAM FLOORS FOR RESIDENCES

Study of deterioration in residential construction reveals that, even with the best of foundations, walls and roof, serious and expensive defects develop as soon as shrinkage occurs in the floor joists, as it will when they are of wood. The immediate effect of this shrinkage is a settling of all interior construction depending on the floor joists for support. The results are plaster cracks in walls and ceilings, twisted door frames, uneven floors and gaps between baseboards and flooring.

When the J & L Junior Beam floor for residences is used, the first floor is an integral part of the foundations, providing the same rigid, vibration-free, non-shrinkable support for the interior walls of the house that the foundations provide for the exterior walls. It acts as a complete fire stop between the basement and the remainder of the house, and prevents moisture from rising through partition walls to the floors above. It is vermin-proof and impervious to the attacks of termites.

The J & L Junior Beam floor for residences is universally adaptable. It may be used as the first floor of any house, without imposing any restrictions whatever on either the architect or the builder. The additional advantages of having the same steel and concrete system for the floors above the first are available in any house having solid masonry walls or steel framing. Any type of wearing surface may be applied, hardwood, terrazzo, tile, linoleum, composition block, etc. By following the methods described and illustrated in the following pages, the architect can easily design a Junior Beam floor and any experienced builder can make up his list of materials and install this steel and concrete system as easily as the old-fashioned wooden joist floor. The materials may be obtained through the usual sources of steel supply, or the Jones & Laughlin Steel Corporation will furnish the names of Junior Beam dealers in any given territory.

CONSTRUCTION OF A J & L JUNIOR BEAM FLOOR

The principal materials in the J & L Junior Beam floor for residences are steel and concrete, combined to give maximum structural soundness at lowest cost. No fabrication is required for connecting the steel beams. See Figure 1, in which (1) shows how Junior Beams rest on lower flange of carrying member and (2) how standard stirrup hanger is used to support Junior Beam at right angle to another Junior Beam or standard I-beam.

Fig. 2-a illustrates the installation of the Junior Beam Floor in veneer construction. Outside brick wall, interior wall, concrete firestop and slab and the hardwood wearing surface are cut away to show details of the floor. The Junior Beams are shown resting directly on concrete foundations. The sleepers (2 in. by 3 in. wooden nailing strips) are held securely to the steel by two plate clips at each point where they cross a Junior Beam. Two plain steel reinforcing bars, ¼ in. in diameter, are fastened to the Junior Beams between sleepers. The concrete floor slab and the concrete firestop along the foundation wall are then poured in temporary wooden forms, imbedding the top flanges of the Junior Beams, so that the beams, sleepers and reinforcing rods are held rigidly in place. Sleepers are spaced from 12 in. to 16 in. apart and the concrete is leveled approximately ¼ in. to ⅜ in. below the tops of them. The hardwood floor is nailed directly to the sleepers. The 2 in. by 4 in. plate for receiving sidewall studs is nailed to wooden blocks imbedded in the concrete firestop along the sidewall shown.

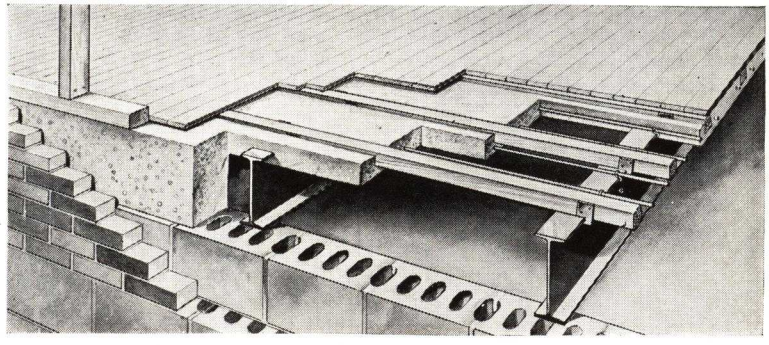


Figure 2-a

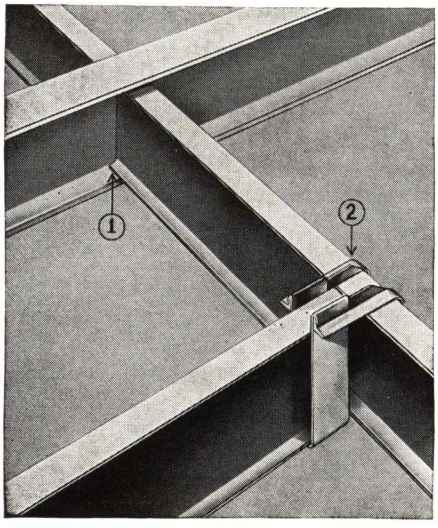


Figure 1

Fig. 2-b shows the J & L Junior Beam floor for residences with linoleum finish. When the finished floor is to be linoleum, tile, terrazzo, wood parquet or any material to be set in mastic, no sleepers are necessary. The concrete slab is floated smooth at the time of pouring, and requires no separate finish to receive the mastic. The finished flooring is then applied according to the manufacturer's specifications. In this floor, ¼ in. steel reinforcing bars are placed 18 in. apart at right angles to the principal reinforcing of similar material, to prevent temperature cracks in the slab. Reinforcing mesh of equivalent strength may be used in place of reinforcing bars.

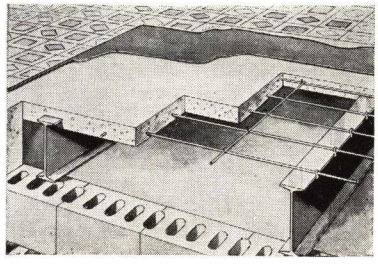


Figure 2-b

HOW TO LAY OUT A J & L JUNIOR BEAM FIRST FLOOR FOR A TYPICAL RESIDENCE

In the laying out of a house for Junior Beam Floors, approximately the same system that is used in placing wood supports can be applied to locating the steel beams and supporting columns. The main carrying beam is placed under the bearing partition. The Junior Beams are then located in the same manner as wooden joists. Junior Beams are doubled under non-bearing partitions. In framing a stairwell, a Junior Beam, supported by the standard stirrup hanger, serves as the header.

Fig. 3 shows the first floor architectural plan and the corresponding steel layout for a representative moderate priced house. The bearing partition separating the living room from the dining room and kitchen, supports the floor joists of the second floor and attic. Therefore, the main carrying member is located under this partition. In this house, the position of the stairwell prevents running the main carrying member from wall to wall, so it is stopped at the stairwell and supported by a basement column, either a pipe or H-column with plates welded or bolted on both top and bottom. Another main carrying member is placed across the projection at the front of the house.

The next step in laying out the steel is the locating of the Junior Beams that frame the stairwell. The flanges of these beams should be kept approximately 1 in. from the stair opening to allow for plastering. Next, two Junior Beams are located under each of the non-bearing partitions (the one partition separating dining room and kitchen and the other separating living room and stairway to second floor). The final step is the locating of the remaining Junior Beams necessary to carry the floor only, at spacings that are multiples of the width of the boards to be used for the concrete form. For detail drawings of floor construction see pages 13 and 14.

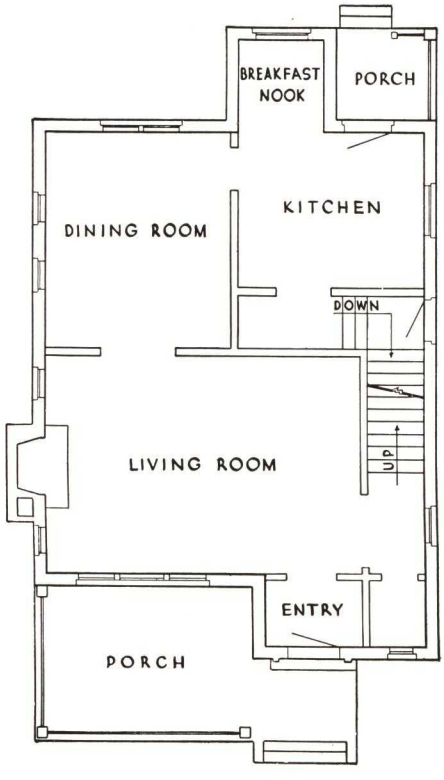
The Junior Beam layout is based on the beam sizes and spacings shown in the table on page 11. The range of live loads in this table covers requirements of all the various building codes. In addition to these live loads, a dead load of 45 lbs. per sq. ft. is provided for in the spacings given. The dead load is made up of:

Finished Flooring	4 lbs. per sq. ft.
Concrete	30 lbs. per sq. ft.
Junior Beams	3 lbs. per sq. ft.
Plaster ceiling	8 lbs. per sq. ft.
Total dead load	45 lbs. per sq. ft.

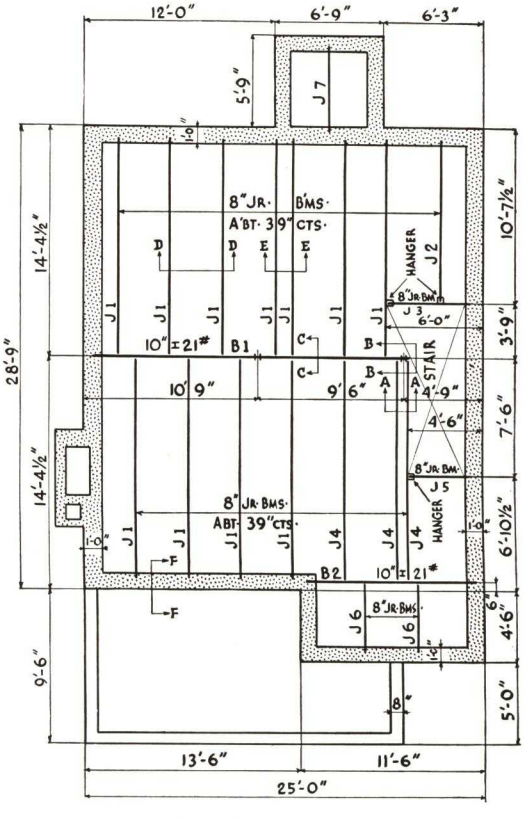
The spacings given in the table are based on the use of 8 in. common lumber (four, five or six boards between Junior Beams).

Use of Junior Beams of the same size throughout the floor represents the simplest construction. This eliminates need for end fabrication of the steel and for bringing foundation walls to different levels. Generally the saving in money on these two items will more than cover the extra cost of any excessive weight in the steel used. By referring again to the table it will be noted that the 8 in. Junior Beam can be used for spans up to 16 ft., and will meet the floor plan requirements of most moderately priced houses.

Occasionally a condition is encountered that obviously will overload a Junior Beam. Where this occurs the Junior Beam should be replaced by a standard I-beam of equal depth. Overloading of Junior Beams is most likely to result from use of tile floor and tile walls in bathrooms and from exceptionally wide stair openings.



First Floor Plan



First Floor Steel Plan

Figure 3

(For Construction Details at Section Points on First Floor Steel Plan refer to Pages 13 and 14)

TABLE OF JUNIOR BEAM SPACINGS

For Various Live Loads

Span	20 Lb. L. L.		30 Lb. L. L.		40 Lb. L. L.		50 Lb. L. L.		60 Lb. L. L.	
	Size ins.	Space ins.	Size ins.	Space ins.	Size ins.	Space ins.	Size ins.	Space ins.	Size ins.	Space ins.
12′-0″	6	31	6	31	—	—	—	—	—	—
	7	46	7	46	7	39	7	31	7	31
	8	46	8	46	8	46	8	46	8	39
	9	46	9	46	9	46	9	46	9	46
13′-0″	6	31	—	—	—	—	—	—	—	—
	7	39	7	39	7	31	7	31	8	31
	8	46	8	46	8	46	8	39	9	46
	9	46	9	46	9	46	9	46	10	46
14′-0″	7	39	7	31	8	39	8	31	8	31
	8	46	8	46	9	46	9	39	9	39
	9	46	9	46	10	46	10	46	10	46
15′-0″	7	31	8	39	8	31	8	31	9	31
	8	46	9	46	9	39	9	39	10	46
	9	46	10	46	10	46	10	46	11	46
16′-0″	8	39	8	31	8	31	9	31	9	31
	9	46	9	39	9	39	10	46	10	39
	10	46	10	46	10	46	11	46	11	46
17′-0″	8	31	8	31	9	31	9	31	10	31
	9	39	9	39	10	46	10	39	11	46
	10	46	10	46	11	46	11	46	12	46
18′-0″	8	31	9	31	9	31	10	31	10	31
	9	39	10	46	10	39	11	46	11	39
	10	46	11	46	11	46	12	46	12	46
19′-0″	9	31	9	31	10	31	10	31	11	31
	10	46	10	39	11	46	11	39	12	46
	11	46	11	46	12	46	12	46	—	—
20′-0″	9	31	10	31	10	31	11	31	11	31
	10	39	11	46	11	39	12	46	12	39
	11	46	12	46	12	46	—	—	—	—
21′-0″	10	39	10	31	11	31	11	31	12	31
	11	46	11	39	12	46	12	39	—	—
	12	46	12	46	—	—	—	—	—	—
22′-0″	11	39	11	39	11	31	11	31	12	31
	12	46	12	46	12	39	12	39	—	—
23′-0″	11	39	11	31	11	31	12	31	12	31
	12	46	12	39	12	39	—	—	—	—
24′-0″	12	39	12	39	12	31	12	31	12	29

NOTE:—When spacings are greater than 39″, sleepers should be 2″ x 4″ laid flat, instead of the usual 2″ x 3″ beveled sleepers.

TYPICAL BILL OF MATERIALS

The bill of materials for the first floor of this typical house, made up from only the completely dimensioned foundation plan (Figure 3), is as follows:

1 piece 10″ I 21 lb. x 20′-1″ marked B1 (flat flange)
1 piece 10″ I 21 lb. x 10′-6″ marked B2 (flat flange)
11 pieces 8″ Jr. Bms. x 13′-7¼″ marked J1
1 piece 8″ Jr. Bm. x 9′-8½″ marked J 2
1 piece 8″ Jr. Bm. x 5′-1″ marked J3
3 pieces 8″ Jr. Bms. x 13′-9″ marked J4
1 piece 8″ Jr. Bm. x 3′-7″ marked J5
2 pieces 8″ Jr. Bms. x 4′-2¾″ marked J6
1 piece 8″ Jr. Bm. x 5′-4″ marked J7

2 pieces 4″ H 13.8 lbs. Cols. x 6′-8″ with 8″ x ½″ x 8″ Base Plate and 6″ x ½″ x 6″ Cap Plate.

3 Standard stirrup hangers for 8″ Jr. Bms. supported by 8″ Jr. Bms.

1300 Lineal feet of ¼″ Round Reinforcing Bars.

450 Standard Plate Clips for Sleepers.

200 Reinforcing Bar Clips.

B1 and B2 to be punched with 13/16″ holes staggered in top flange about 3′-0″ apart.

1 Beam J1 and J4, and Beams J3 and J5 to be punched in web with 13/16″ holes 2′-6″ Cts. for attaching blocks around stairwell.

If flexible conduit is used all beams should be punched with 13/16″ holes in webs about 4′-0″ Cts.

The length given for the main carrying beam allows 6″ bearing on the foundation wall and holds the other end, supported by columns, 1″ from the stair opening. Junior Beams are specified at lengths that allow 3½″ bearing on foundation walls and approximately ¾″ clearance from center of main carrying member to allow for the web thickness of that section.

The Junior Beam stairwell headers (J3 and J5 on Figure 3) are cut to allow approximately ¼″ clearance between the ends of them and the edge of the flanges of the Junior Beams (J1 and J4 on Figure 3) on which they are supported by standard stirrup hangers. Note that in ordering standard stirrup hangers to support one beam at right angles to another, the size and type of both the beam to be supported and the carrying beam must be specified.

APPLYING THE J & L JUNIOR BEAM SYSTEM TO FLOORS ABOVE THE FIRST

In the preceding page the application of the Junior Beam system has been limited to the first floor, as a Junior Beam first floor may be installed in any house regardless of the materials used for frame and outside wall. The additional advantages of also having the Junior Beam system in floors above the first are available in any house having masonry walls or steel framing.

While Junior Beam floors throughout a house represent additional dead load, the footer course under foundation walls need not be wider than the usual 18 in. or 24 in., providing the soil will safely support a load of 3,000 lbs. per sq. ft. The load on exterior walls is about 4,500 lbs. per lin. ft. The load on the columns is 90 lbs. per sq. ft. of floor supported when the live load is calculated at 40 lbs. In this house, the center column supports 420 sq. ft. of floor, or about 36,000 lbs. and the column footing should be designed accordingly.

The vertical supports may be either regular pipe columns or 4 in. H-sections with plates welded or bolted on both top and bottom. Plates on the columns should not be wider than flange on the main carrying member the columns support. The only holes in all of this steel construction which must be located accurately are those in the flanges of the main carrying members providing for bolting these beams to the plates on the ends of the columns. As in Junior Beam first floor construction, Junior Beams throughout other floors are rested on masonry walls and bottom flanges of main carrying members, or are supported in standard hangers.

THE J & L JUNIOR BEAM SECOND FLOOR

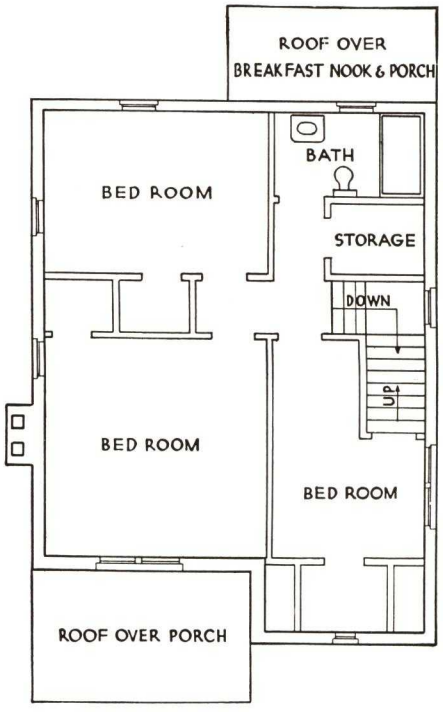
The second floor architectural and steel plans (Fig. 4, next page) illustrate how the same beam arrangement used in the first floor is retained as far as possible in the second floor, with the main carrying member and supporting columns in the same relative positions. This allows for duplication in lengths of materials used in the two floors and also permits the builder to use much of his form lumber in the second floor just as he used it in the first floor.

The procedure in laying out the steel for the second floor is the same as that followed in making up the bill of materials for the first floor. The main carrying member is located, the stairwell framed, Junior Beams doubled under non-bearing partitions and the remaining area spanned by Junior Beams spaced to correspond as nearly as possible with the first floor Junior Beam spacing. It will be noted that a header beam has been placed across the projection at the rear of the house, to support the wall above it, just as a similar header beam was placed across the projection at the front of the house in the first floor steel plan. Because of the addi-

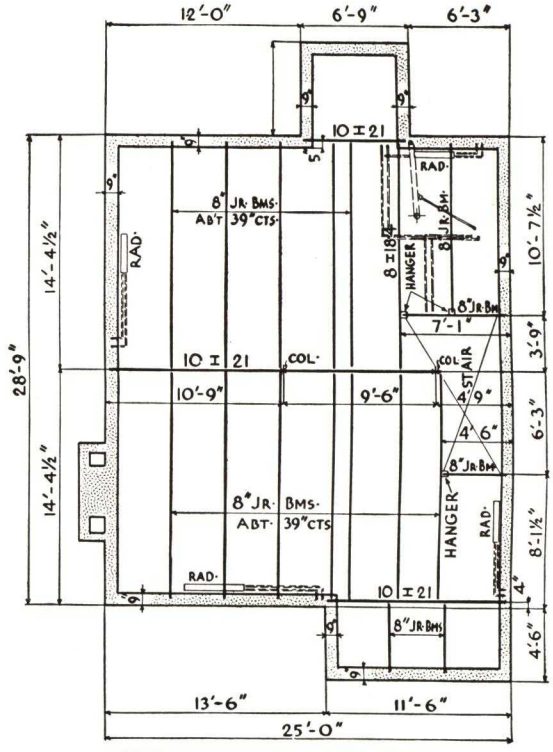
tional load of bathroom floor and walls, an 8 in. standard I-beam is used in place of a Junior Beam at this point.

It will be seen from the location of radiators and bathroom fixtures, as shown in the steel plan, that it will be necessary for the steam fitter and plumber to burn only a few holes in the webs of Junior Beams to accommodate piping.

As in the case of the foundation walls, the second floor walls are brought to an even elevation.



SECOND FLOOR PLAN

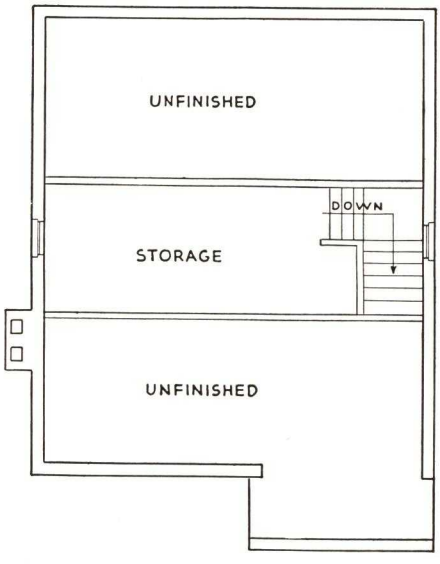


SECOND FLOOR STEEL PLAN

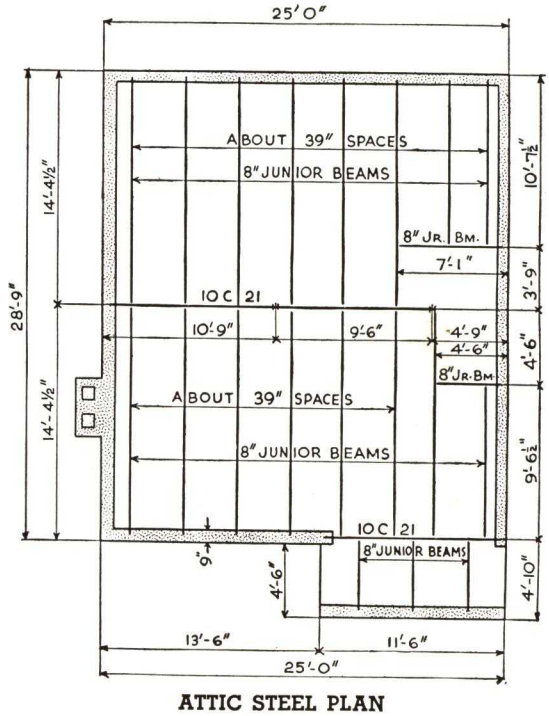
Figure 3

THE J & L JUNIOR BEAM ATTIC FLOOR

The architectural and steel plans (Fig. 4) for the attic illustrate the similarity between making up the bill of material for this floor and for the first and second floors. The principal difference between this floor and those under it is the absence of non-bearing partitions paralleling the Junior Beams in the attic, which makes it unnecessary to double the beams at any point.



ATTIC FLOOR PLAN



ATTIC STEEL PLAN

Figure 4

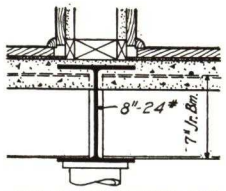
INSTALLATION DETAILS • J & L JUNIOR BEAM

Wood Finish Flooring on Sleepers

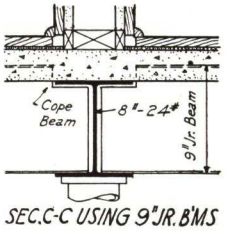
(For points at which sections are taken refer to First Floor Steel Plan, Page 10)

The large Section C-C shows 8-in. deep Junior Beams framing into a 10-in. flat flange girder. The Junior Beams rest directly on the flat lower flange of the girder without fabrication. Either 8-in. or 9-in. (see smaller Section C-C) frame into a 10-in. girder without coping. Wooden sleepers are fastened securely to the top flanges of the Junior Beams by two standard sleeper clips and steel reinforcing bars are attached with standard reinforcing rod clips. Where doorways are cut through the bearing partition, sole plates are omitted and the flooring runs over the girder without a break. Section D-D shows the construction of a typical bay and Section E-E shows the spacing of the Junior Beams at a non-bearing partition.

The vertical supports may be either regular (unfilled) pipe columns or 4-in. H-sections with plates bolted or welded on both top and bottom. Plates should be no wider than the girder flanges.

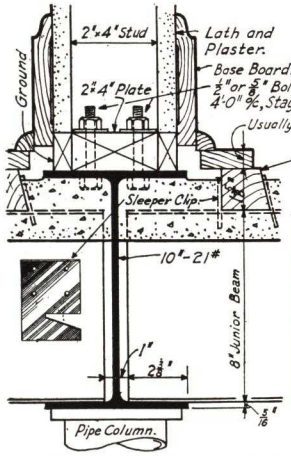


SEC. C-C USING 7" JR. B'MS

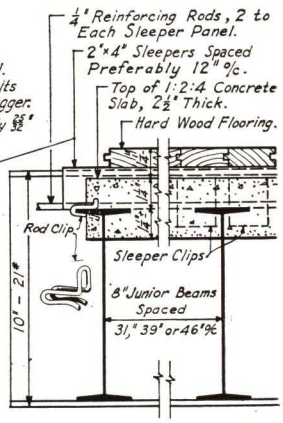


SEC. C-C USING 9" JR. B'MS

Scale $\frac{3}{4}$" = 1'-0"



SECTION C-C THRU GIRDER AT BEARING PARTITION



SECTION D-D THRU TYPICAL BAY

Scale : 1½" = 1'-0"

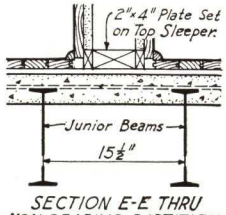
Wood or Other Types of Finish Flooring Set in Mastic

(For points at which sections are taken refer to First Floor Steel Plan, Page 10)

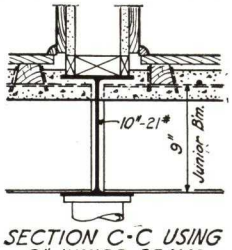
When the finished floor is to be linoleum, tile, terrazzo, wood parquetry blocks, or any material to be set in mastic, no sleepers are necessary. The concrete slab is floated smooth at the final pouring and requires no separate finish to receive the mastic. The finished flooring is then applied according to the manufacturer's directions. The 8-in. 24# flat flange section is used as a girder. The slab passes over the top of the main carrying member as shown in Section C-C.

When 8-in. or 9-in. Junior Beams are required to carry the load, they must be coped for framing into the 8-in. girder (see lower small Section C-C). The 7-in. Junior Beams can be framed without coping (see upper small Section C-C). Since the top flanges of the Junior Beams are held rigidly by the slab, no bridging is necessary to insure lateral rigidity. Section D-D shows construction of typical bay.

The vertical supports may be either regular pipe columns or 4-in. H-sections with plates welded or bolted on both top and bottom. Plates should be no wider than the girder flange.

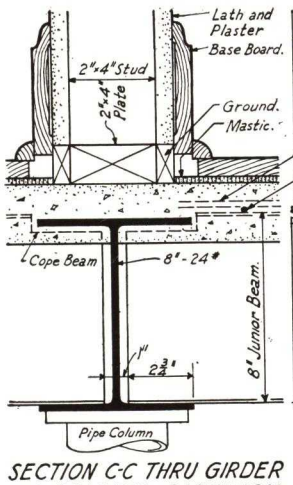


SECTION E-E THRU NON-BEARING PARTITION

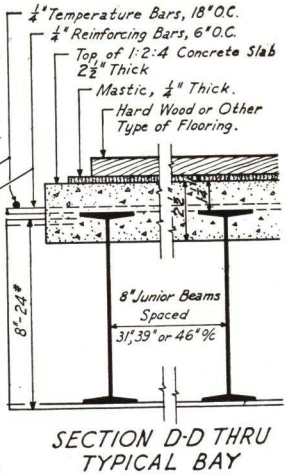


SECTION C-C USING 9" JUNIOR BEAMS

Scale : $\frac{3}{4}$" = 1'-0"



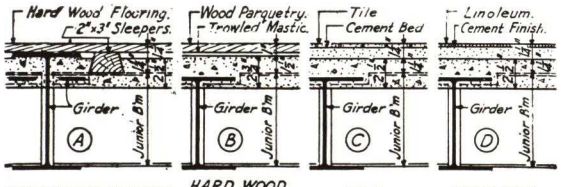
SECTION C-C THRU GIRDER AT BEARING PARTITION



SECTION D-D THRU TYPICAL BAY

Scale : 1½" = 1'-0"

Various Floor and Ceiling Treatments



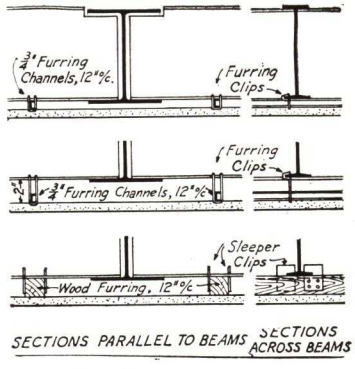
HARD WOOD FLOORING ON WOOD SLEEPERS — HARD WOOD PARQUETRY LAID IN MASTIC — TILE FLOORING — LINOLEUM FLOORING

At "A" above is shown hardwood flooring applied to sleepers. With a 10 in. girder, it is necessary to use 8 in. or larger Junior Beams. This is so that 2 in. by 3 in. sleepers will carry the finish flooring over the top flange of the girder. With an 8 in. girder any size Junior Beams may be used that satisfy the requirements of the load to be carried.

At "B" is shown hardwood parquetry block flooring set in mastic, and made to line with the construction at "A" by making the slab ¼ in. thicker. Parquetry block floors not required to line with wood flooring on sleepers would have the usual 2½ in. slab.

Details "C" and "D" show how tile or linoleum floors are made to line with the wood floor, in cases where they are used for baths, kitchens, etc.

For ordinary basement ceilings, J & L Junior Beam construction presents a neat and acceptable appearance. Where special rooms require a plastered ceiling, the construction is rendered very simple by the use of standard J & L furring clips, (see illustration). These are made in four sizes to permit a clearance of ¾ in., 1 in., 1½ in., or 2 in. between the bottoms of the beams and the plaster. The installation of electric conduit may be handled in several different ways. It may be imbedded in the concrete slab. Flexible conduit may be run through holes punched at the neutral axis in the webs of the Junior Beams. Flexible conduit may be run between the plaster and the bottoms of the Junior Beams by the use of the standard furring clips. Rigid conduit may be fastened to the bottom flanges of the Junior Beams, in which case, if a plaster ceiling is to be applied, the 2 in. furring clips are used to give ample room. For ceiling finishes that must be held in place by nails, furring strips are fastened to the bottom flanges by inverting the standard sleeper clips.



SECTIONS PARALLEL TO BEAMS — SECTIONS ACROSS BEAMS

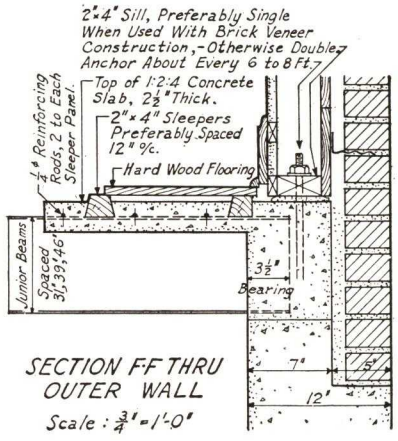
INSTALLATION DETAILS • J & L JUNIOR BEAM

Details of End Bearing on Foundation

(For points at which sections are taken refer to First Floor Steel Plan, Page 10)

Since the top of the foundation wall on which the Junior Beams have their bearing may be irregular or uneven, it becomes necessary to level them by shimming. Cement grout or wooden wedges may be used as leveling material, since the beams are held by their upper flanges as soon as the concrete has attained its set, and the material used for shimming carries no load.

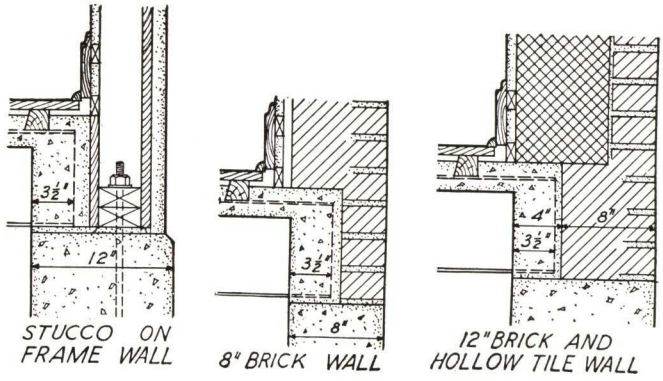
The sill details shown indicate the complete firestopping obtained with this construction. It is at the sill that a great deal of the harmful shrinkage occurs in the ordinary wood-framed house. The J & L Junior Beam floor does not shrink. It is rigid, vibration-free, and shrinkproof.



SECTION F-F THRU OUTER WALL
Scale: ¾"=1'-0"

In the section showing brick veneer construction, the floor must be in place before the wall framing is erected.

The drawings show hardwood flooring on sleepers, but the sill construction is similar for any type of finished flooring.

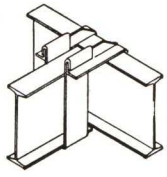


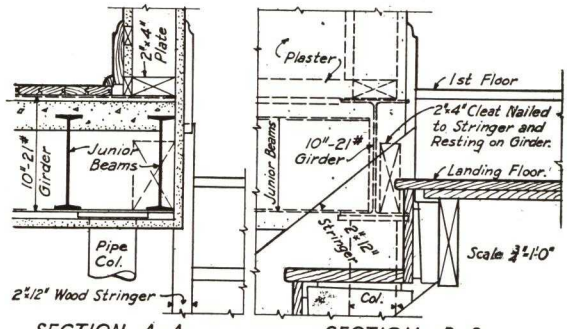
STUCCO ON FRAME WALL
8" BRICK WALL
12" BRICK AND HOLLOW TILE WALL

Stair Details and Plumbing Pipes

(For points at which sections are taken refer to First Floor Steel Plan, Page 10)

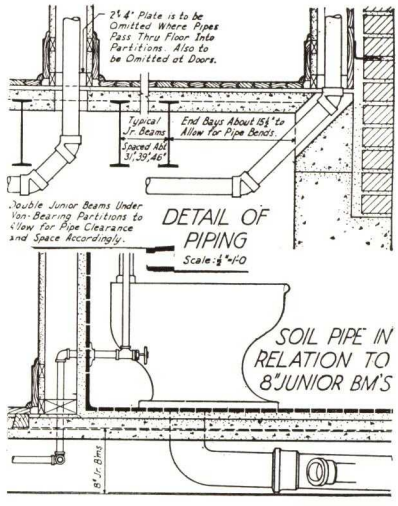
For supporting a Junior Beam at right angles to another Junior Beam or standard I-beam, a standard stirrup hanger is employed. This is not a fixed connection. The stirrup hanger keeps the top flanges of the beams flush. It is used for framing headers and trimming around stair openings, chimney openings, etc.





SECTION A-A
SECTION B-B

At the right is shown how pipes are carried through the concrete floor slab and into non-bearing partitions. Pipe sleeves or boxes are set in the concrete form to maintain a seal between basement and the floors above. In houses having a hot air system, the ducts enter non-bearing partitions in a similar manner. Where pipe is carried into the outside wall, the opening thru the firestop is provided by setting a pipe sleeve inside the concrete form. The first Junior Beam must be placed at least 10 in. from the wall to give the plumber room in which to work.



SPECIFICATIONS FOR J & L JUNIOR BEAM FLOOR FOR RESIDENCES

1. Jones & Laughlin Junior Beams of the size and at the spacings as shown on the plans shall be used to support the (first) (first and second) (first, second and third) floors.

2. Two Junior Beams, spaced to provide for piping, shall be used under non-bearing partitions running parallel with Junior Beams.

3. The main carrying beam (or beams) and columns under bearing partitions shall be as shown.

If bearing partition plate is to be bolted to main carrying member:

4. Main carrying beam (or beams) shall be punched in top flange with 13/16 in. holes about 4 ft. 0 in. centers staggered.

If flexible conduit is to be used:

5. Junior Beams and main carrying beam (or beams) shall be punched in webs with 13/16 in. holes about 4 ft. 0 in. centers.

6. Beams framing stairwell shall be punched in webs with 13/16 in. holes to provide for blocking.

7. Bearing of steel on walls shall be 6 in. for main carrying beam (or beams) and a minimum of 3½ in. for Junior Beams.

8. All steel shall have one shop coat of paint.

9. Concrete forms shall be built so that the bottom of the concrete slab will be approximately 1¼ in. below the tops of Junior Beams. (See "J & L Junior Beams for Residences" published 1935 by Jones & Laughlin Steel Corporation, for recommended form construction.)

SPECIFICATIONS FOR J & L JUNIOR BEAM FLOOR FOR RESIDENCES (Continued)

If wood flooring is to be nailed or pegged to sleepers:

10. Beveled 2 in. by 3 in. sleepers (2 in. by 4 in. sleepers laid flat) spaced at (12 in.) (16 in.) centers, shall be placed directly on top of flanges of Junior Beams and fastened securely to each beam by two standard plate clips, one on each side of sleeper. Concrete reinforcing shall be ¼ in. round steel reinforcing bars spaced at 6 in. centers and fastened to top flanges of Junior Beams by reinforcing bar clips. Floor shall be leveled after forms, sleepers and reinforcing bars are in place.

If finished flooring is to be set in mastic:

11. Concrete slab shall be floated smooth at time of pouring. Concrete reinforcing shall be ¼ in. round steel bars spaced at 6 in. centers and fastened to top flanges of Junior Beams by reinforcing bar clips. Temperature reinforcing shall be ¼ in. steel reinforcing bars spaced at 18 in. centers and placed at right angles to main reinforcing. Steel mesh of equivalent strength may be used in place of ¼ in. steel reinforcing bars. Floor shall be leveled after forms and reinforcing are in place.

If construction is to be frame or veneered walls:

12. Firestop around outside walls shall be constructed as shown on the plans and shall be continuous around entire building. (See "J & L Junior Beam Floors for Residences" for firestop details.)

13. Sleeves or boxes shall be placed in concrete formwork to accommodate piping which will pass through concrete floors and concrete firestop.

14. The concrete slab shall be a 1-2-4 mix with pea gravel or crushed aggregate not exceeding ½ in. in size. Concrete shall be of a consistency that, when poured, it may be worked well under top flanges of Junior Beams (and under sleepers. Concrete shall be leveled approximately ¼ in. below tops of sleepers.) When forms are stripped, under side of slab shall present an even surface free from honeycombing or spalling under beam flanges.

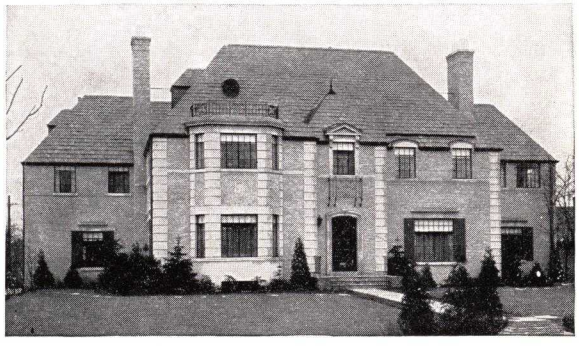
If new lumber is used for forms:

15. Form lumber, after being stripped, may be used for roof sheathing.

TYPICAL RESIDENCES HAVING J & L JUNIOR BEAM FLOORS

RESIDENCES, CYNWYD, PA.

Architect: Max A. Bernhardt Builder: L. H. Greenhouse & Co.



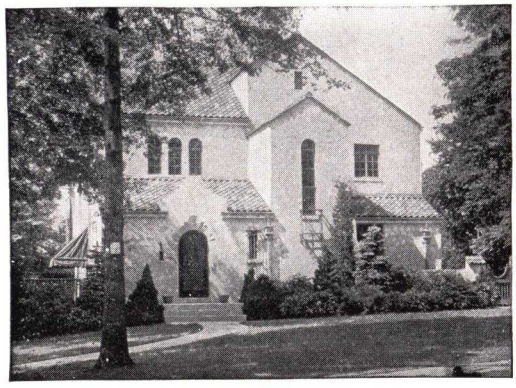
RESIDENCE, EVANSTON, ILL.

Architect: Raymond F. Houlihan Builder: C. A. Hemphill

RESIDENCE, SOUTH ORANGE, N. J.

Owner: A. Burton Cohen

Architect: Thomas Paterson, Jr.



RESIDENCE, LEXINGTON, MASS.

Architect: Howland S. Chandler Builder: Custance Brothers

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS

GENERAL OFFICES

Jones & Laughlin Building, Pittsburgh, Pa.

SALES OFFICES

Atlanta	Healey Building	Kansas City, Mo.	Dierks Building
Baltimore	Baltimore Trust Building	Los Angeles	Roosevelt Building
Boston	Consolidated Gas Building	Memphis	1 Auction Avenue
Buffalo	Liberty Bank Building	Milwaukee	Bankers Building
Chicago	Conway Building	Minneapolis	Phoenix Building
Cincinnati	Carew Tower	New Orleans	N. Miro & Japonica Streets
Cleveland	Union Commerce Building	New York	500 Fifth Avenue
Dallas	Magnolia Building	Philadelphia	Broad St. Station Building
Denver	Continental Oil Building	Pittsburgh	Jones & Laughlin Building
Detroit	Fisher Building	St. Louis	Boatmen's Bank Building
Harrisburg	600 No. Second Street	San Francisco	Standard Oil Building
Houston	Shell Building	Seattle	Smith Tower

Tulsa ..... Thompson Building

CANADIAN REPRESENTATIVES

JONES & LAUGHLIN STEEL PRODUCTS COMPANY
Pittsburgh, Pa., U. S. A.

Toronto Daily Star Building, Toronto, Ont., Canada

J & L WAREHOUSES

Chicago	Cincinnati	Detroit	Memphis
New Orleans	New York (Long Island City)*		Pittsburgh

FABRICATING WORKS

Chicago	Cincinnati	New Orleans
New York (Long Island City)*		Pittsburgh

*Operated by Jones & Laughlin Steel Service, Inc.

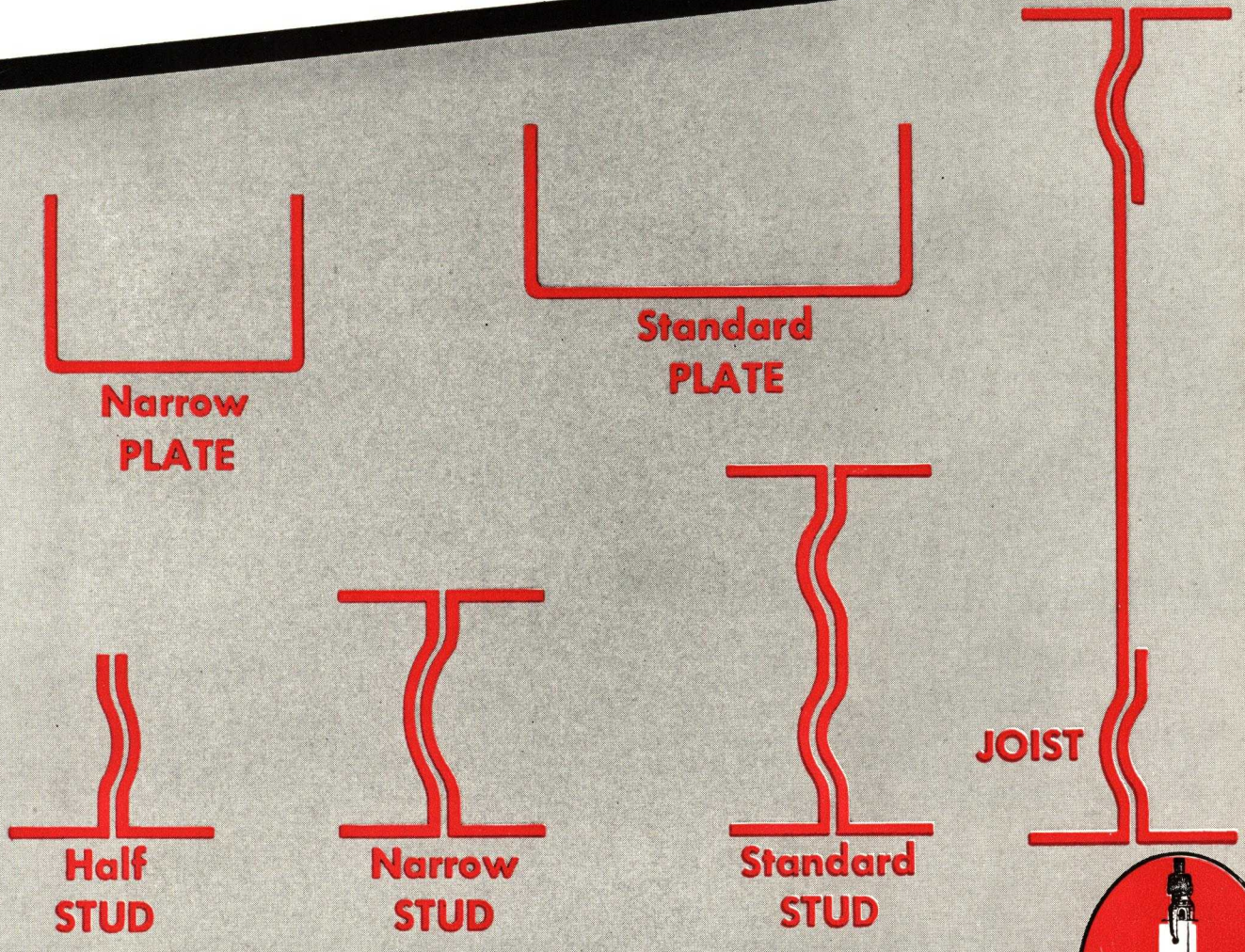
SECTION 3

CONTINUED ⟶

MEMORANDA

STRAN-STEEL

Architectural and Engineering Data

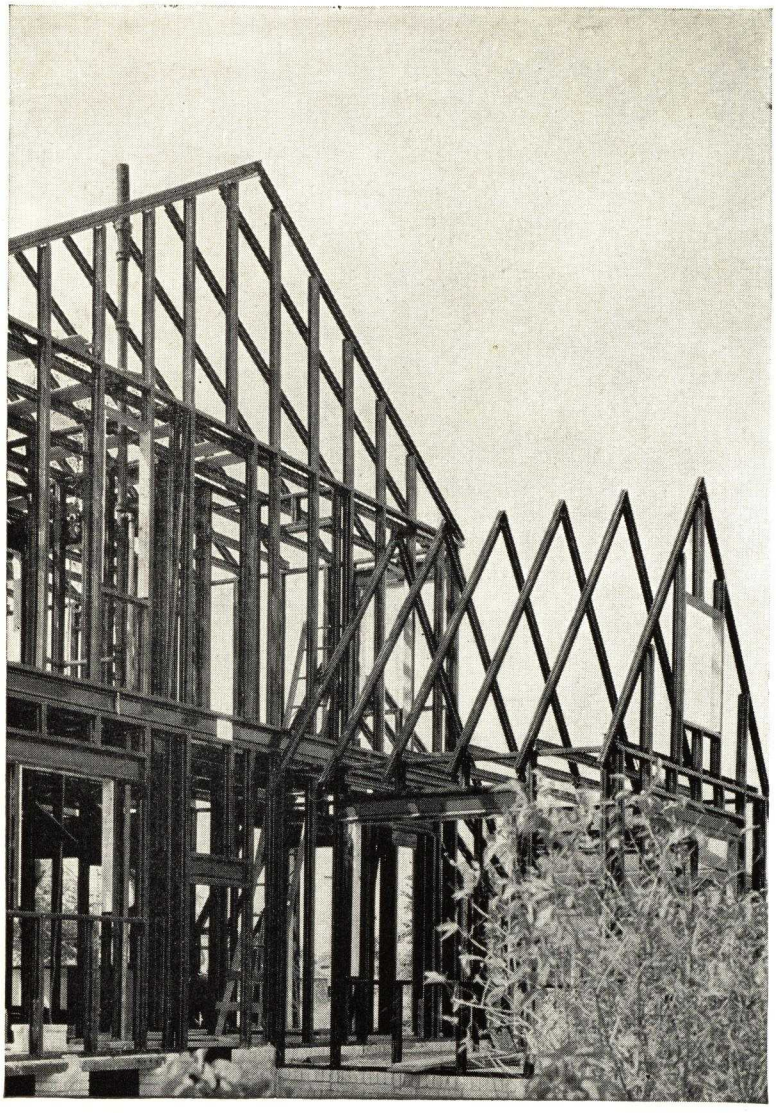


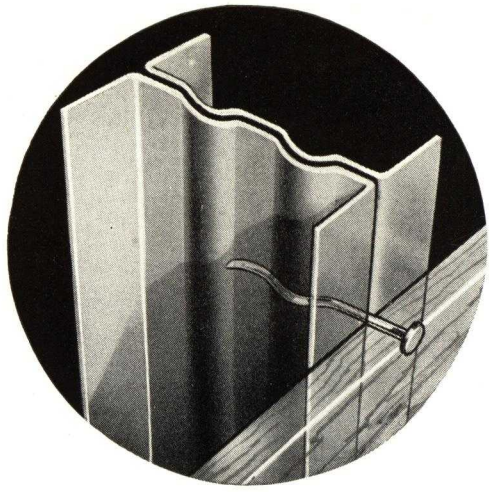
UNIT OF NATIONAL STEEL

STRAN-STEEL DIVISION

GREAT LAKES STEEL CORPORATION

DETROIT, MICHIGAN





● STRAN-STEEL'S patented nailing groove is a curved space between two strips of channel-shaped steel welded back-to-back to form the member. Nails driven through collateral materials into this space are clinched in a grip of steel.

STRAN-STEEL RESIDENTIAL CONSTRUCTION

STRAN-STEEL is a strong and sturdy steel framing material for houses, partitions and all other light-load-bearing structures. It is rigid, warp-proof, shrink-proof, and provides a maximum of fire-safety.

EASY TO HANDLE

STRAN-STEEL sections are easy to handle. The erection of STRAN-STEEL framing closely parallels normal wood construction practice. STRAN-STEEL standard lengths are made so that a minimum of cutting is needed.

STRAIGHT AND TRUE

STRAN-STEEL sections are straight and true. It is not necessary to place the "crown" up, for there is no crown on STRAN-STEEL members. Being steel, they are free from knots, checks, tendency to split and warp, and will not change their dimensions due to atmospheric changes. These sections are made to machine limits and are entirely uniform. This is the case whether you use a short piece, or a much longer member.

ONLY SIMPLE TOOLS USED

In most cases, only the ordinary hand tools used in general carpentry are required in erecting STRAN-STEEL. What cutting is required is done with a hack saw or, where a large quantity is used on a job, a portable power saw.

STANDARD MEMBERS

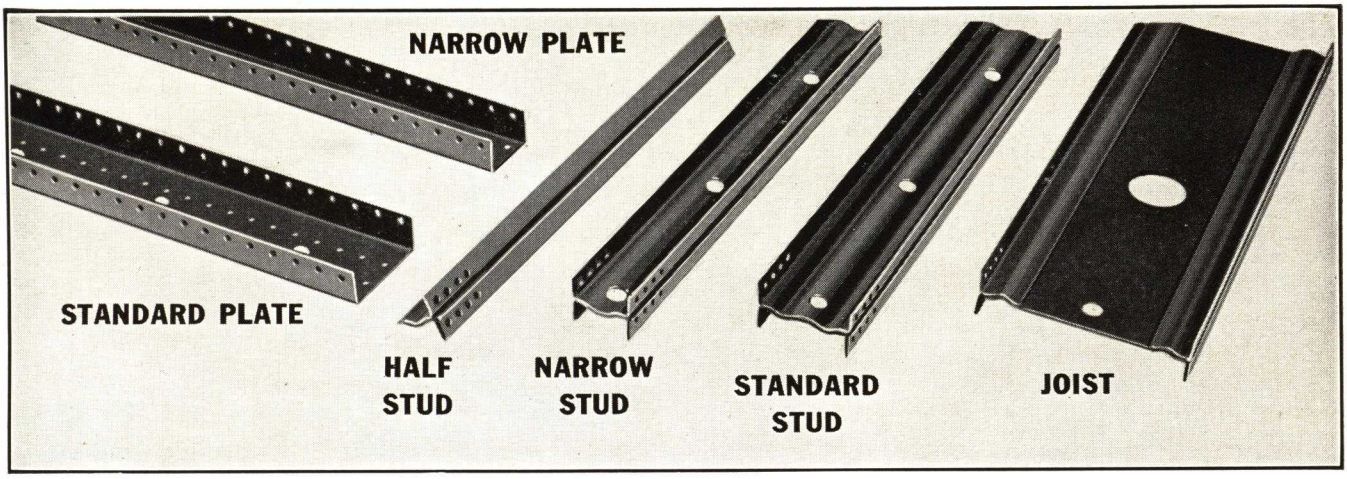
STRAN-STEEL is obtainable in the form of studs, joists, rafters and sill plates. It is carried in stock, cut to standard lengths to eliminate most of the cutting on the job.

NO CHANGE IN PLANS REQUIRED

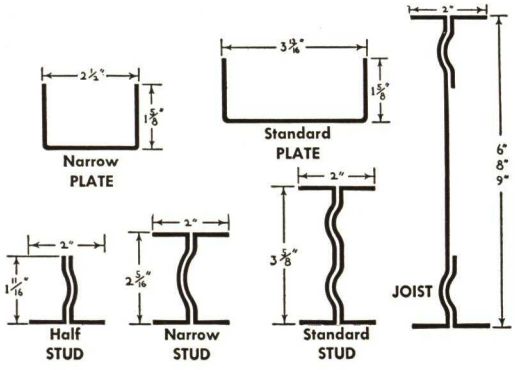
The construction of a building in which STRAN-STEEL is used proceeds in the same way as if ordinary framing were used. Dimensions of STRAN-STEEL members conform exactly to the requirements of other materials used with it. Therefore, using STRAN-STEEL entails no change of architectural plan. Special detailing is not required. All standard exterior and interior materials may be used with STRAN-STEEL. It is erected easily and quickly by anyone skilled in carpentry and the usual practices of house construction. No welding is required. Connections are made with self-thread-cutting sheet metal screws.

SUPPLIED BY LUMBER DEALERS

In many cities STRAN-STEEL is available through lumber dealers who stock, sell and service this material. These dealers have the constant co-operation of the Great Lakes Steel Corporation, STRAN-STEEL Division.



DIMENSIONS of Typical Main Members



● Width over flanges and depth of typical STRAN-STEEL members are shown here.

A durable, rust-resisting, COPPER BEARING STEEL is specified for all STRAN-STEEL joists. Several times more rust-resistant than ordinary steel, this alloy is rolled in our own mill—tailor-made to meet rigid inspection and exacting specifications.

STRAN-STEEL MEMBERS

Simplicity and adaptability characterize STRAN-STEEL. There are only three main members. One of these, the joist member, is supplied in various gauges to accommodate varying floor spans and loads. Studs and plate are furnished in several widths. Rafters are formed from either stud or joist sections.

TYPICAL JOIST—Joists are manufactured in five gauges—16-14-13-12-11. This member is used for floor joists and roof rafters. Recommended spacing 24″ o.c. See Table of Properties—Page 12.

STANDARD STUD—3⅝″ in depth with 2″ flange. This member is used for framing exterior walls up to two and one-half stories and interior bearing walls of two stories. Recommended spacing of STRAN-STEEL studding is 24″ o.c. This member is also used for ceiling joists and roof rafters.

NARROW STUD—2 5/16″ in depth with 2″ flange. This member is used for framing exterior walls up to two stories in height and interior bearing and non-bearing walls. This member is also used for ceiling joists having light loads. This member is adaptable as furring around ducts, pipe chases, etc., where nailing of collateral materials is required.

HALF STUD—1 11/16″ deep with 2″ flange. This member is used as an auxiliary nailing piece to provide for nailing of collaterals where structural strength is not required.

STANDARD PLATE—3 13/16″ wide with 1⅝″ flanges. This member is used with 3⅝″ stud section as a top and bottom plate and as a sill and head member for window and door openings where nailing section is not desired. Holes in flanges punched at 1″ intervals for stud connections. Punching in web of channel for anchor bolts at 6″ intervals.

NARROW PLATE—2½″ wide with 1⅝″ flanges. This member, used with narrow stud, is similar to standard channel plate with similar punching.

STANDARD PUNCHING FOR PIPE, WIRING, CONDUITS, ETC.—All STRAN-STEEL main members are factory punched in the webs except the half stud section. Holes are provided in the studding for the passage of conduits, etc. In the web, 1¼″ from each end, a hole 13/16″ in diameter is punched for the placing of a government anchor. In the web, 36″ apart, holes 2⅜″ in diameter are punched for piping, etc. Joists and studs are punched on top and bottom flanges with eight holes 13/64″ in diameter, for the placing of screws.

FINISH—All STRAN-STEEL members and attachments are painted with a heavy dip-coat of special rust-resisting red enamel. The finish is tough and very adhesive—will not chip, and resists scratching in handling and erection.

STANDARD LENGTHS—See table on page 12.

3/7

STRAN-STEEL

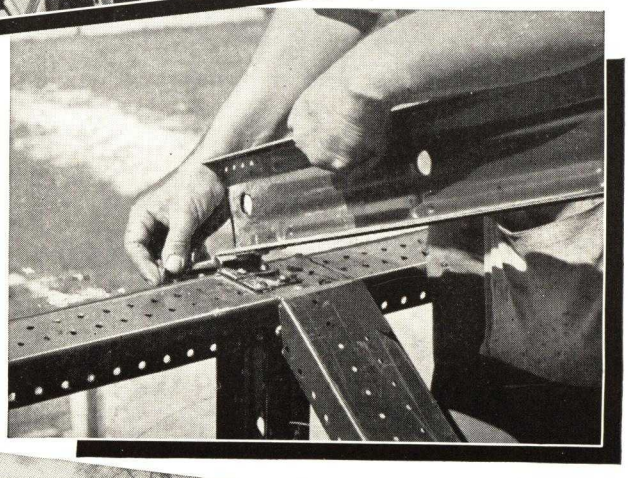
ROOF FRAMING

In residential roof construction, STRAN-STEEL provides permanence, rigidity and fire-safety, the most important factors in the construction of any roof. STRAN-STEEL eliminates rotting, warping, sagging and the consequent damage responsible for much of the expense of maintaining a home.

The design of a home determines which STRAN-STEEL members should be used. Their use conforms to standard practice, making it possible for anyone familiar with roof design and construction to select the proper members. STRAN-STEEL 3⅝″ studs are used where 2 x 4's are ordinarily used. And on roofs with long spans, STRAN-STEEL joists, or 3⅝″ stud sections with supports, are used.

Although lightning is not considered a major hazard, it accounts for many fires and fatalities each year. Its destructiveness is greater in structures of poor electrical conductivity, such as wood, stone, brick and concrete. Should lightning strike a building framed with STRAN-STEEL, the bolt is immediately grounded through the framework itself, thus safeguarding both structure and occupants. STRAN-STEEL framing has no effect on radio reception.

● Tightening bolts at rafter peak after rafters have been raised and temporarily braced in position.



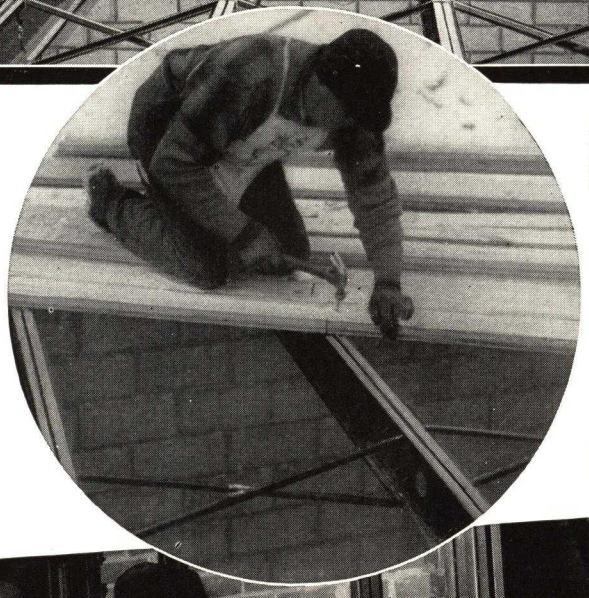
● Inserting hinge pin in rafter hinge; the hinge takes care of any pitch roof and the pin is held in place with cotter key.

STRAN-STEEL
FLOOR CONSTRUCTION

Fire-safe, sound-proof floors in modern house construction are laid on STRAN-STEEL joists as readily and simply as on wood joists. When concrete sub-floors are to be laid, metal lath is stapled directly to the STRAN-STEEL joists and concrete is poured over the lath to the standard thickness of 2″. Concrete floors may also be poured over corrugated metal decking attached directly to the STRAN-STEEL joists. Then the finish flooring, whether wood, wood block, tile, linoleum or cement, completes the floor, making it rigid, fire-safe and sound-proof.

When wood sub-floors are used, the rough flooring is nailed to the STRAN-STEEL joists and the finish flooring handled as in ordinary practice.

STRAN-STEEL joists are furnished to the job either cut to fit or in standard lengths. In either case, cutting is seldom required. The joists are ready to install as they come from the lumber dealer.



● Before pouring concrete sub-floors, metal lath is stapled directly to the STRAN-STEEL joists.

● When wood, plywood or insulation board is used for sub-flooring, it is nailed to the STRAN-STEEL joists as in ordinary construction.

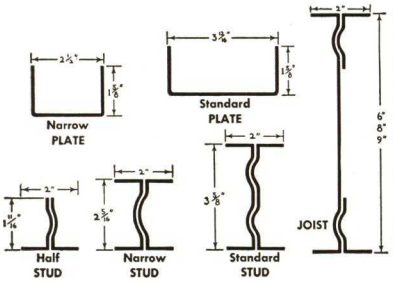
STRAN-STEEL
WALL CONSTRUCTION

The erection of walls in STRAN-STEEL construction is quite simple and follows usual practices with but one important deviation. Fewer STRAN-STEEL studs are needed because they are erected farther apart—24″ between centers as compared to 16″ in wood construction.

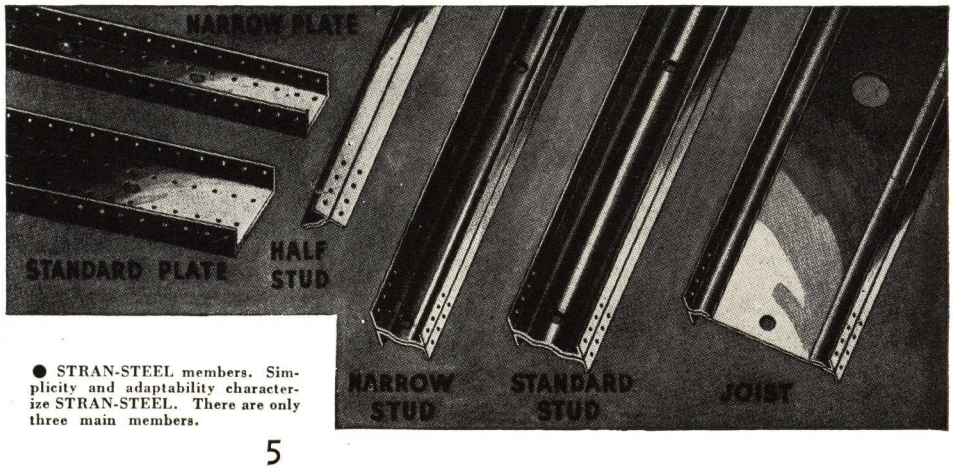
In finishing exteriors, sheathing is nailed to the STRAN-STEEL studs and siding; shingles, brick, stucco, etc., are handled according to usual methods. The same thing is true of interior walls. Lath or wallboard, and plaster are handled as in established construction practices.

● Wall construction with STRAN-STEEL follows usual practices, lath or wallboard being nailed to the studding.

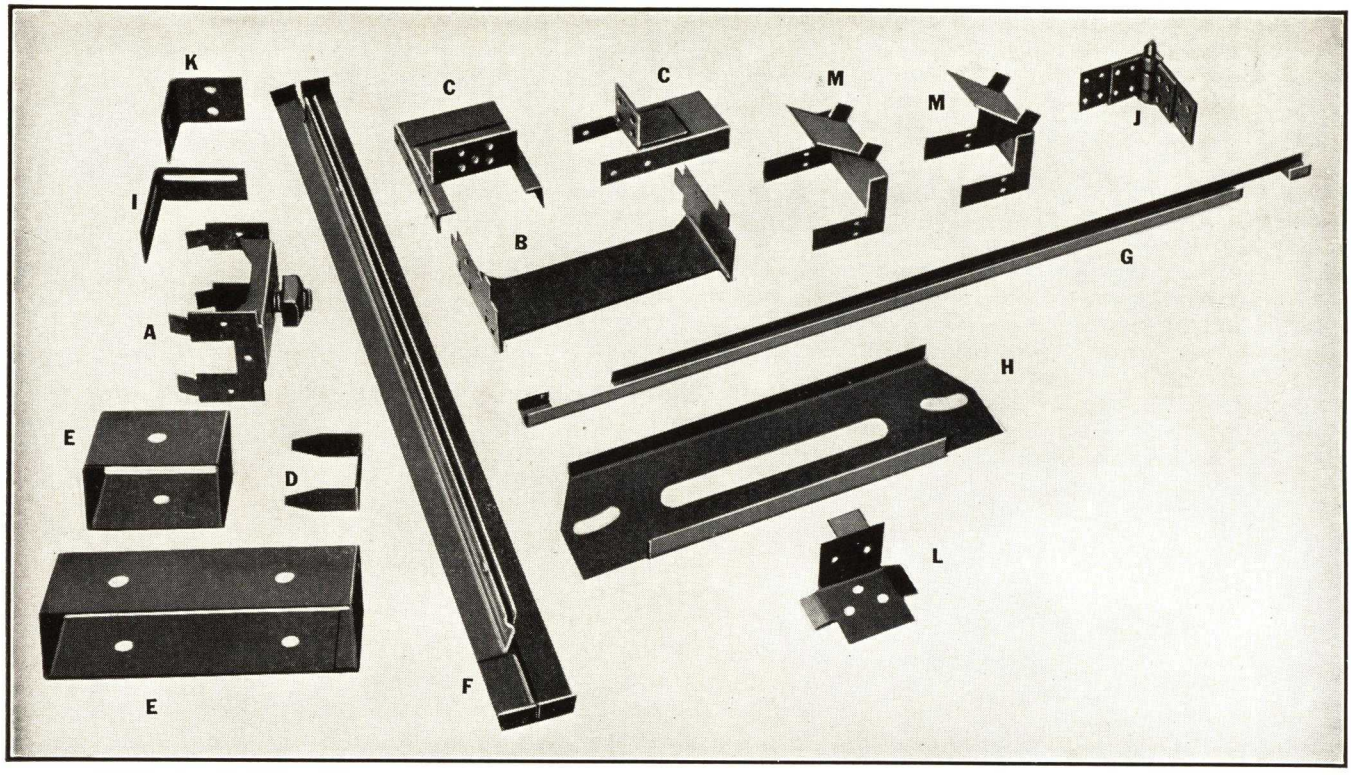
DIMENSIONS of MAIN MEMBERS



● All STRAN-STEEL studs and plates are made from 16-gauge steel. Joists come in five gauges as shown on page 12.



● STRAN-STEEL members. Simplicity and adaptability characterize STRAN-STEEL. There are only three main members.



STRAN-STEEL ATTACHMENTS

One of the features which has much to do with the rapid acceptance of STRAN-STEEL is the simplicity of the attachments. The illustrations and the descriptions show the striking degree to which all attachments have been simplified. They are designed to interconnect all STRAN-STEEL members with metal-attaching screws, or bolts; several are also punched for nailing to main members for additional security.

A—COLLAR TIE BRACKET—For attaching members (used as collar ties) to rafters.

B—JOIST HANGER—For joists, various gauges. Attaches rapidly and securely with screws.

C—HEADER BRACKETS—For connecting joist headers and stud headers over openings.

D—C-CLIP—Driven into nailing grooves of adjacent parallel members as a tie. Usually spaced 18″ to 3′ apart.

E—HIP AND VALLEY COLLARS—For connecting rafters and jack rafters to the hip and valley members.

F—PARTITION SUPPORT—Used under each stud of non-bearing partitions which run parallel to and between joists.

G—BRIDGING, CHANNEL TYPE—Used in pairs between joists. Ends are coped out to engage joist flanges.

H—RAFTER PLATE—For connecting rafters and jack rafters to the hip and valley members.

I—CORNER BRACKET—Used at top and bottom of stud and plate corner; also bent to reinforce all corners other than 90°, such as bays, etc.

J—RAFTER HINGE—Loose butt hinge with cotter key through hinge pin; connects lower ends of rafters to plate.

K—ANGLE BRACKET—Used to connect valley rafters to top wall plate.

L—COMBINATION CLIP—Connects stair carriage to adjacent stud; also used for tying half stud lath backing to adjacent studs.

M—RAFTER CLIPS—Connects gable studs to rafters.

MUSHROOM-HEAD NAILS—2½″ and 1⅝″ zinc-coated or plain nails with 1″ inverted cup heads, used for attaching gypsum board plaster base, insulating sheathing, etc.; large head secures adjacent edges of board joints. Supplied in 10-lb. cartons as an extra item, if specified; 10 lb. required for 1000 sq. ft. of side wall; 15 lb. required for 1000 sq. ft. of ceiling.

SCREWS—Cadmium-plated No. 14 sheet metal self-thread-cutting screws.

YOUR ORDER

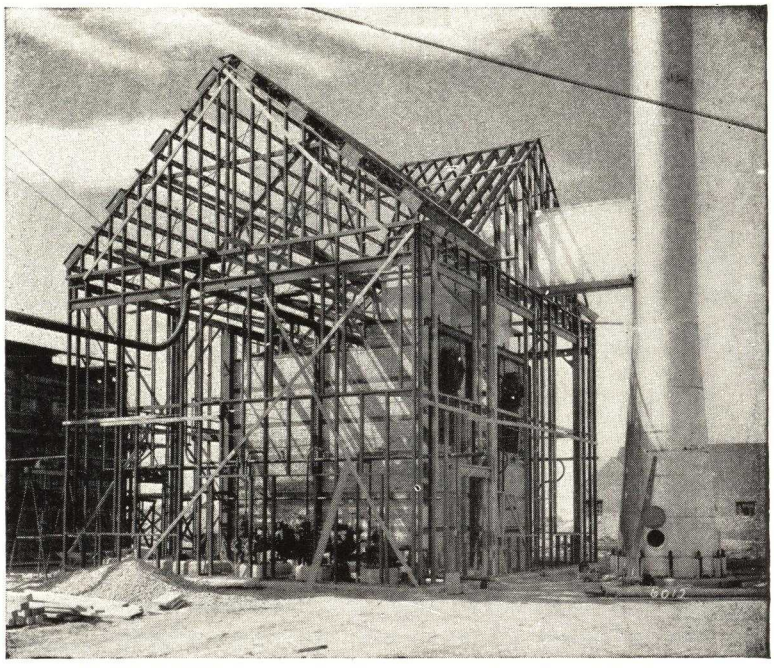
For further information and prices, see your local lumber dealer, or write direct to the STRAN-STEEL Division of Great Lakes Steel Corporation, 607 Shelby St., Detroit, Mich. Be sure to send your specifications and drawings.

STRAN-STEEL
for INDUSTRIAL USES

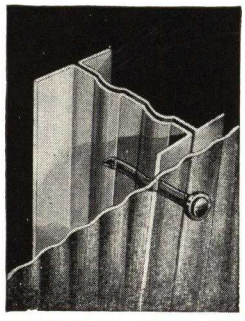
STRAN-STEEL framing is widely used for industrial buildings, houses, partitions and all light-load-bearing structures. It combines permanency with protection against shrinkage and termites. Used with fire-safe collateral materials, STRAN-STEEL makes a fire-safe structure. When the structure is grounded by water pipes or other means, it is lightning-proof. The use of STRAN-STEEL proves particularly advantageous in industries such as the oil industry, where the construction program includes a variety of buildings of different types and sizes.

STRAN-STEEL is supplied in the form of joists, studs, rafters and plates. A feature of its design (see phantom illustration) permits nailing collateral materials directly to the steel framework. Because it is produced to conform to established dimensions of the materials which it replaces, its use requires no change in architectural plans or dimensions. Foundations remain unchanged.

STRAN-STEEL permits the use of all standard interior and exterior materials and finishes, including corrugated iron and asbestos sheeting. Any type of roofing material may be used. The STRAN-STEEL frame is quickly erected by the regular carpenter force in much the same manner as a wooden frame building. Connections are made by simple attachments, screw-driver and metal screws. Framing a building with STRAN-STEEL follows the traditional practice closely, except that all members are ordinarily spaced on two-foot centers.



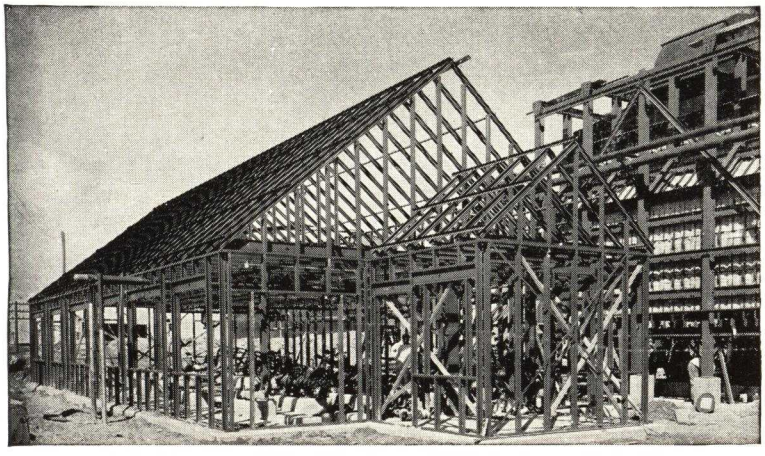
● STRAN-STEEL being used in the construction of a refinery boiler house.



● Illustration shows how STRAN-STEEL is formed to receive and hold ordinary nails. Nails driven into the nailing groove hold with 25 per cent more grip than in wood.

This reduces the number of members used and simplifies certain subsequent operations, such as duct work. Openings are easy to frame in STRAN-STEEL construction and remain true and square. The locations of openings may be altered by removing and replacing a few attaching screws. The use of steel sash and doors in STRAN-STEEL buildings is recommended, but wooden sash and doors may be used where the fire hazard is not a problem and costs must be kept at a minimum.

STRAN-STEEL is sold by the linear foot. It is stocked in standard lengths. The plates and studs are stocked and shipped in conventional lengths. Where companies have standardized their plans or maintain a staff of architects and engineers, no difficulty will be experienced in adapting STRAN-STEEL to the construction specifications. The services of our thoroughly experienced engineering department are available to firms not equipped with architectural and engineering facilities. Send us a rough sketch of the type of building desired, giving size, number of windows, doors, etc., and our engineers will submit suggestions and plans from which the building can be erected.



● STRAN-STEEL pump house under construction for oil country use.

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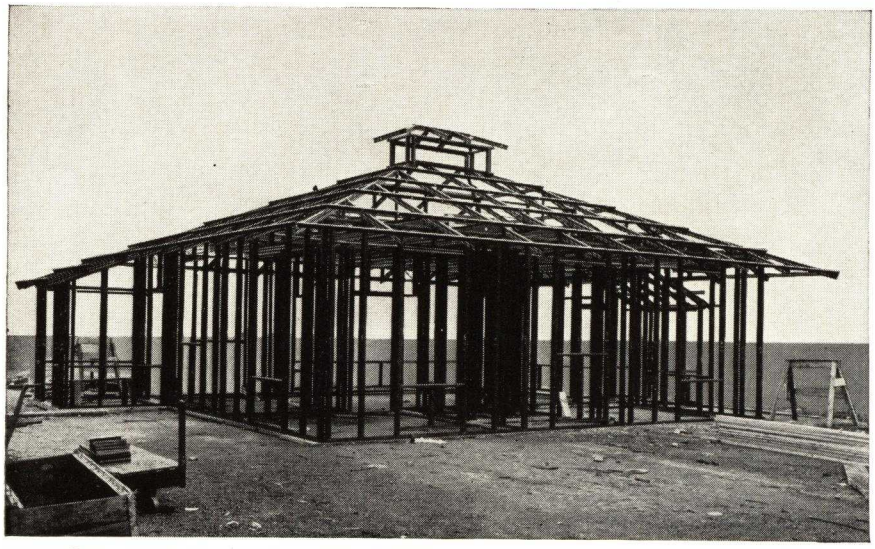
STRAN-STEEL FOR INDUSTRIAL HOUSING AND



● Framework for one of 30 STRAN-STEEL homes built for staff employees by a large corporation in South America.

THE use of STRAN-STEEL is particularly desirable for industrial housing and multiple-dwelling housing projects. Among its many advantages for this type of construction are ease of erection, permanency, fire-safety, and protection against termites.

STRAN-STEEL for Industrial Housing

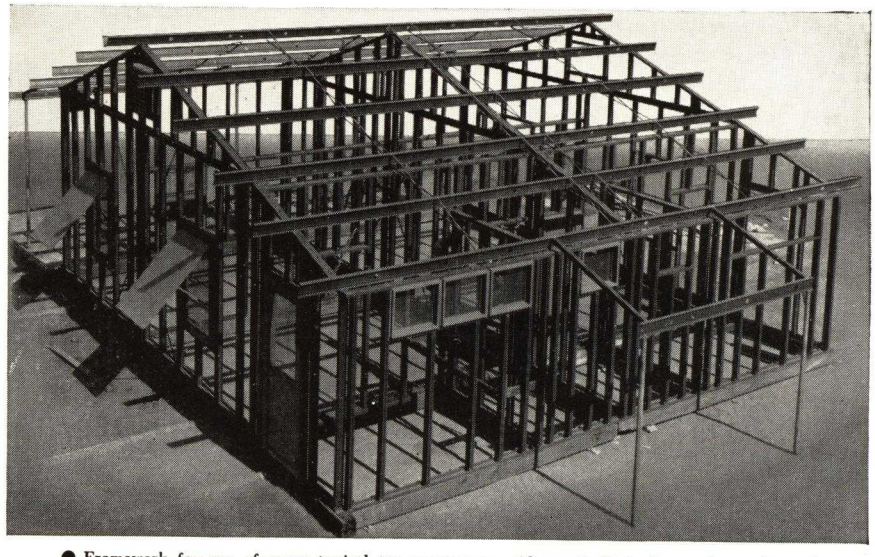
STRAN-STEEL has been used very extensively for industrial housing both in this country and in tropical climates. Large oil and other industrial concerns have used it widely in the construction of homes for employees, as well as for many other types of industrial buildings. Its use assures long life and low maintenance costs. One of its chief advantages lies in its permanency. However, its ease in salvaging permits dismantling and re-erecting houses or other buildings at slight expense when removal is desirable or necessary. Used with other fire-safe collateral materials, STRAN-STEEL makes an entirely fire-safe building. The soundness of STRAN-STEEL construction makes it highly resistant to hurricanes and earthquakes. When the structure is grounded by water pipes or other means, it is lightning-proof.

STRAN-STEEL for Multiple-Dwelling Housing Projects

The adaptability of STRAN-STEEL construction to various sizes and types of buildings is advantageous in mass housing projects. Approved by the F.H.A., it has been used successfully in the construction of large Federal Housing apartment projects. One of these, recently completed, is a two-story, 10-unit, 128-family apartment project in which STRAN-STEEL framing and floor joists were used throughout. The interior finish is plaster on metal lath, which is attached to the STRAN-STEEL framing. A brick veneer finish over a ¾″ rigid board insulation completes the exterior.

Among its many other features, STRAN-STEEL gives soundness of construction and permanency to multiple-dwelling housing projects. These two factors are extremely important in buildings of this nature where the apartments may be subjected to hard usage by tenants.

The permanency provided by STRAN-STEEL results in lower maintenance costs as compared with less permanent types of construction. As an example, STRAN-STEEL does not shrink or warp. Consequently its use minimizes the need for frequent repairs



● Framework for one of many typical two-apartment residences built to house the workers of a large American oil corporation operating in South America.

MULTIPLE-DWELLING HOUSING PROJECTS

to plaster, and other repairs which may be caused by the shrinkage or warpage of materials.

All factors taken into consideration, the cost of STRAN-STEEL is surprisingly low. The first cost may be slightly higher than that of less permanent construction, but its lower maintenance costs make it more economical over a period of time. And, in addition, it provides fire-safety. In most localities the cost of STRAN-STEEL fire-safe construction is less than solid masonry construction. Its use permits wide flexibility in design, wall and roof construction and insulation.

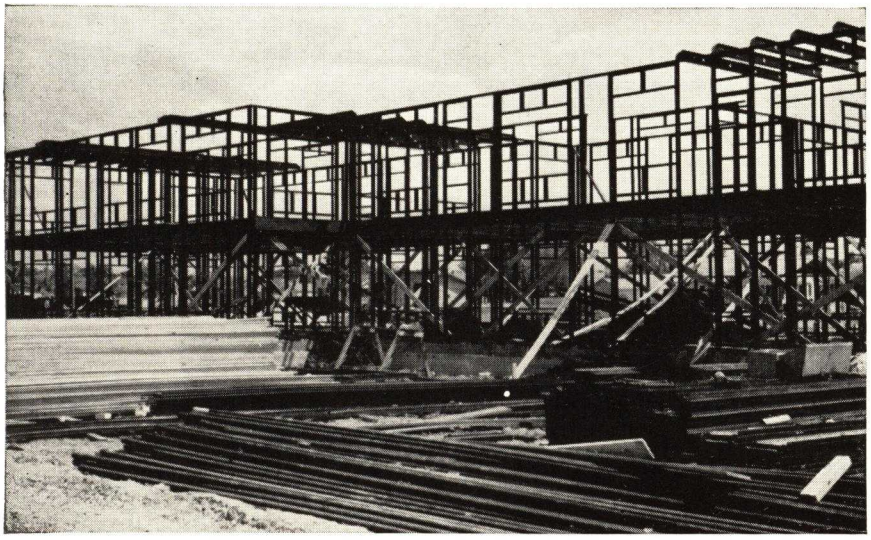
● Completing the second floor outside wall framing on a two-story, 10-unit, 128-apartment Federal Housing project. STRAN-STEEL framing and floor joists are used throughout

General Construction Advantages

STRAN-STEEL joists, studs, rafters and plates for large housing projects can be cut to blueprint at the mill and shipped to the job ready to erect. This saves time on the job and consequently reduces erection costs. A STRAN-STEEL frame can be erected very easily and quickly by the regular carpenter force with the hand tools ordinarily used in building construction. Openings are exceptionally easy to frame, as the steel sections are straight and true. There are no knots or checks to contend with, and, naturally, the steel sections do not split or warp. Insulating materials fit securely into the STRAN-STEEL framing. Either steel or wood doors may be used. STRAN-STEEL lends itself readily to any type of interior or exterior finish and to any roofing material. Workmen quickly become accustomed to STRAN-STEEL erection methods and, as a result, erection progresses smoothly and without loss of time.

Planning the Use of STRAN-STEEL

Where the architectural plans already provide for the use of other materials, STRAN-STEEL can be used without changing the plans or dimensions, as STRAN-STEEL units are produced to conform with the established dimensions of the units which they replace. In the planning of new projects, STRAN-STEEL can be included very easily by following the specifications furnished by us.

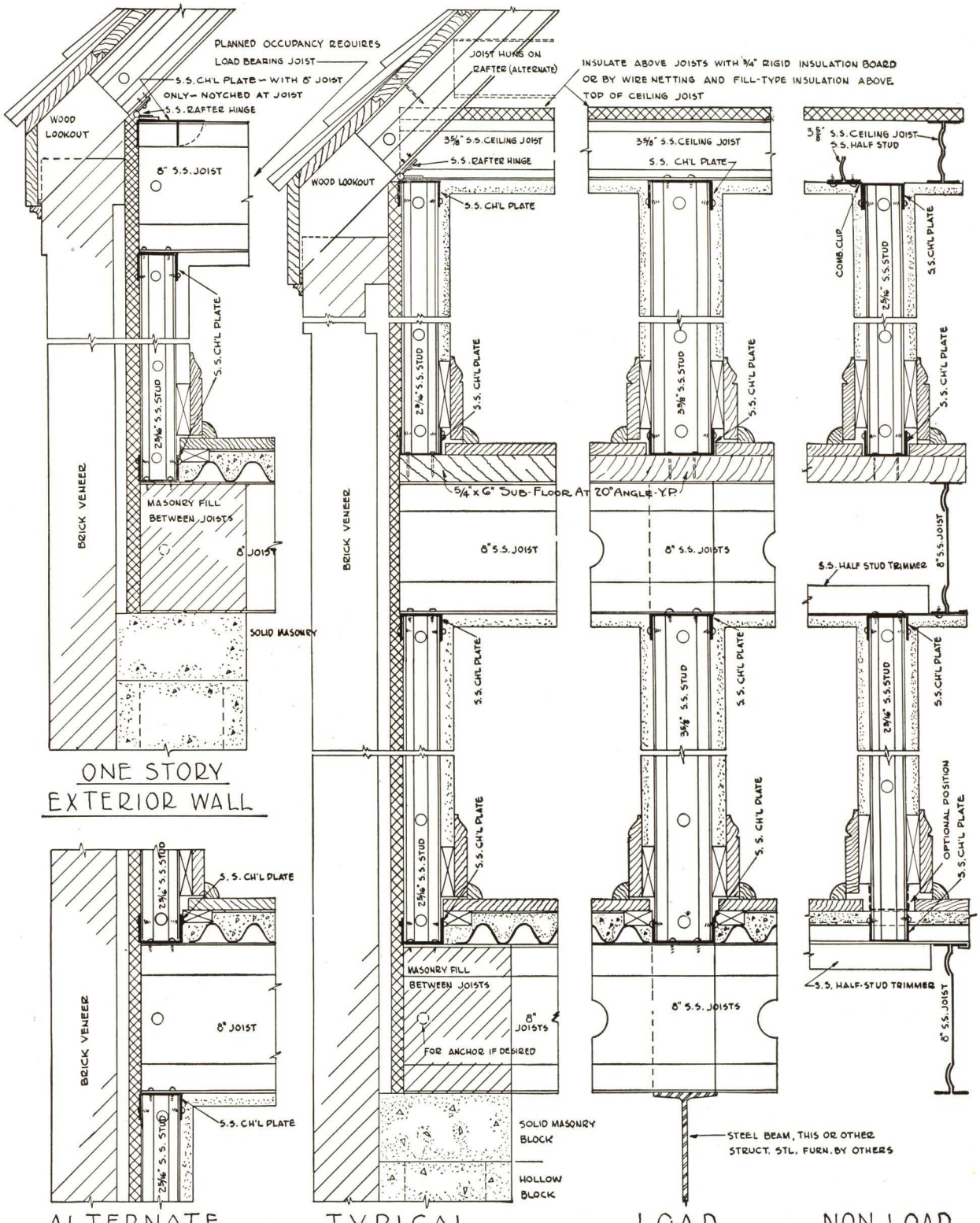


● A STRAN-STEEL structure complete with framing, ceiling and floor joists, all ready for the STRAN-STEEL roof rafters. This is one unit of a large Federal Housing apartment project.

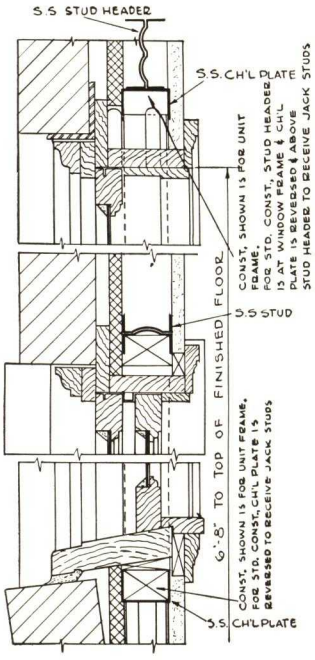
Engineering Recommendations

Our engineers are thoroughly experienced in the practical use of STRAN-STEEL for all purposes. They will be glad to check the plans of architects and builders who are interested in industrial housing and multiple-dwelling housing projects, and make recommendations for the proper, economical and efficient use of STRAN-STEEL. Send your plans direct to us, or write for complete information.

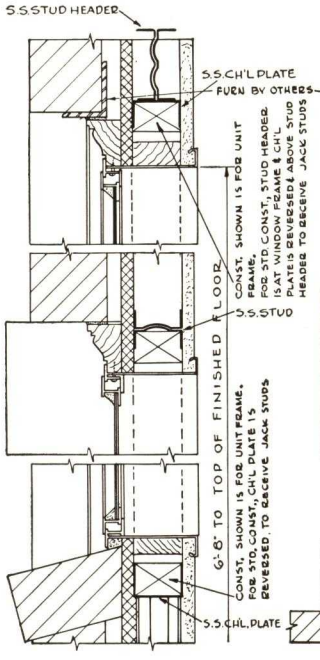
TYPICAL STRAN-STEEL DETAILS



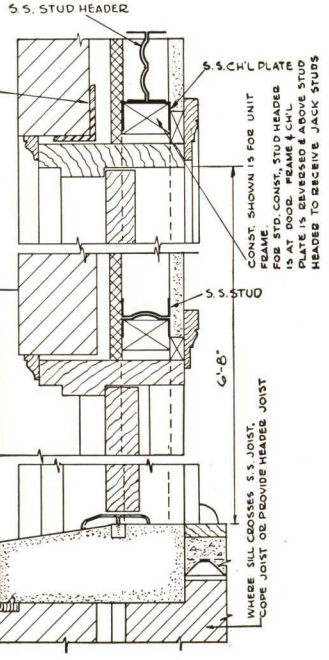
TYPICAL STRAN-STEEL DETAILS



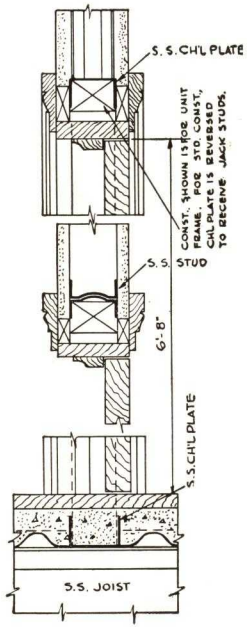
TYPICAL WOOD WINDOW



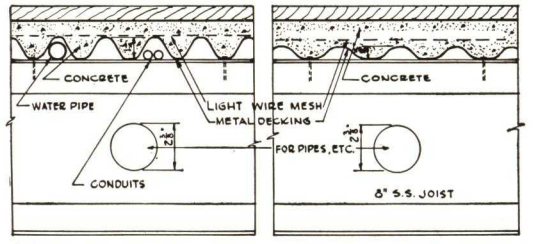
TYPICAL STEEL CASEMENT



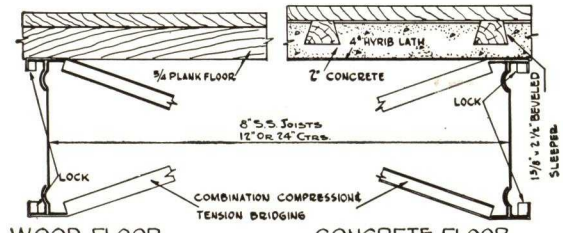
TYPICAL EXTERIOR DOOR



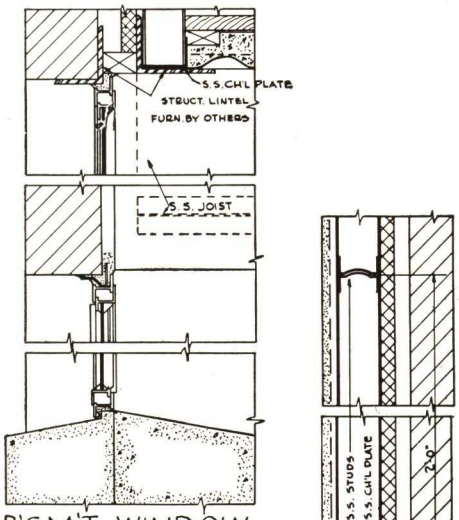
TYPICAL INTERIOR DOOR



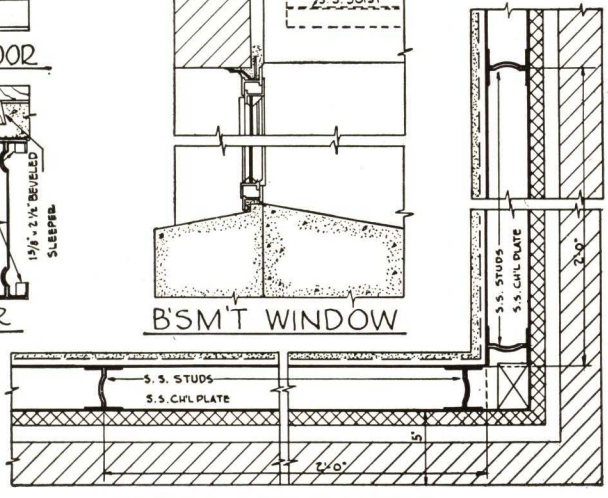
1¼" STEEL SUBFLOOR ¾" STEEL SUBFLOOR



WOOD FLOOR CONCRETE FLOOR

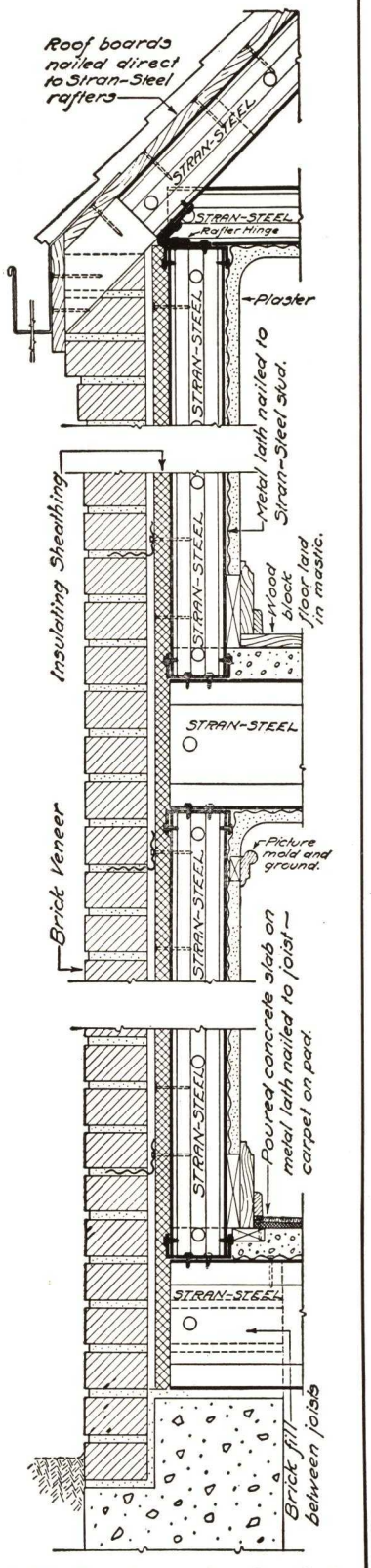


B'SM'T WINDOW



TYPICAL CORNER LAYOUT

TYPICAL STRAN-STEEL WALL SECTION



● The above drawing shows how closely STRAN-STEEL framing parallels ordinary construction. Standard practice is followed in the application of all collateral materials.

TABLE OF GENERAL PROPERTIES *of* STRAN-STEEL MEMBERS

Member \ Properties	Over-all Dimens.	U.S.S. Gauge No.	Gauge Thickness	Area of Section	Weight per Ft.	Axis 1–1				Axis 2–2			
						I	s	r	x	I	s	r	x
6" Joist	2 x 6	13	0.0938	1.182	4.016	5.768	1.923	2.221		0.1292	0.1258	0.340	
	2 x 6	14	0.0781	0.982	3.339	4.855	1.618	2.225		0.1147	0.1122	0.338	
	2 x 6	16	0.0625	0.7930	2.696	3.928	1.309	2.228		0.0916	0.0895	0.336	
8" Joist	2 x 8	11	0.1250	1.801	6.122	15.850	3.963	2.963		0.188	0.185	0.323	
	2 x 8	12	0.1094	1.573	5.327	14.0	3.50	2.970		0.163	0.160	0.320	
	2 x 8	13	0.0938	1.369	4.654	12.112	3.028	2.977		0.138	0.135	0.317	
	2 x 8	14	0.0781	1.140	3.870	10.178	2.545	2.984		0.113	0.112	0.315	
	2 x 8	16	0.0625	0.918	3.121	8.219	2.055	2.992		0.090	0.089	0.313	
9" Joist	2 x 9	11	0.1250	1.961	6.547	21.253	4.723	3.318		0.196	0.193	0.316	
	2 x 9	12	0.1094	1.682	5.719	18.759	4.169	3.326		0.169	0.167	0.313	
	2 x 9	13	0.0938	1.463	4.983	16.221	3.605	3.333		0.143	0.141	0.311	
	2 x 9	14	0.0781	1.218	4.135	13.620	3.027	3.341		0.118	0.117	0.308	
	2 x 9	16	0.0625	0.981	3.333	10.992	2.443	3.348		0.093	0.093	0.306	
3⅝" Stud	2 x 3⅝	16	0.0625	0.660	2.244	1.163	0.641	1.327		0.090	0.086	0.368	
2 5/16" Stud	2 x 2 5/16	16	0.0625	0.500	1.700	0.393	0.340	0.886		0.090	0.085	0.423	
Half Stud	2 x 1 11/16	16	0.0625	0.313	1.062	0.098	0.089	0.561	0.589	0.045	0.043	0.378	
Std. Channel Plate	3 13/16 x 1⅝	16	0.0625	0.368	1.461	0.842	0.442	1.504		0.080	0.063	0.465	0.343
Narrow Channel Plate	2½ x 1⅝	16	0.0625	0.286	1.182	0.309	0.247	1.030		0.070	0.059	0.491	0.431

STRAN-STEEL READILY AVAILABLE FROM STOCK

STRAN-STEEL members are available in all standard lengths as shown in the table below. Stud lengths are determined by conventional ceiling heights. More complete data on STRAN-STEEL is available on request. Your inquiries are invited.

STANDARD LENGTH OF TYPICAL STRAN-STEEL MEMBERS

6", 8", and 9" joists.....8′ to 20′ in 3" increments
3⅝" stud (rafter) 7′0", 7′2", 7′3", 7′6", 8′0", 8′4", to 9′0" in 2" increments
9′4", 9′6", 9′8", 10′0" to 16′ in 6" increments
16′ to 20′ in 1′ increments

2 5/16" Stud—lengths the same as 3⅝" stud
Channel Plate (3¾" and 2½")—20′ lengths
Half Stud —20′ lengths

PROPERTIES AND CALCULATIONS

STRAN-STEEL JOISTS

Joist Type	Nominal Depth, Inches	Resisting Mom., Inch Pounds	Resisting Mom., Foot Pounds	Max. End Reaction, Lb.	Section Modulus	Average Weight per Foot of Joist
6"—16 Ga.	6	23560	1965	1300	1.309	2.696
6"—14 Ga.	6	29125	2425	1625	1.618	3.339
6"—13 Ga.	6	34615	2885	1950	1.923	4.016
8"—16 Ga.	8	36990	3085	1600	2.055	3.121
8"—14 Ga.	8	45810	3820	2000	2.545	3.870
8"—13 Ga.	8	54505	4540	2400	3.028	4.654
8"—12 Ga.	8	63000	5250	2800	3.500	5.327
8"—11 Ga.	8	71335	5945	3200	3.963	6.122
9"—16 Ga.	9	43975	3660	1750	2.443	3.333
9"—14 Ga.	9	54485	4545	2190	3.027	4.135
9"—13 Ga.	9	64890	5410	2630	3.605	4.983
9"—12 Ga.	9	75040	6255	3060	4.169	5.719
9"—11 Ga.	9	85015	7095	3500	4.723	6.547

TYPICAL EXAMPLE

Showing method of determining uniform and concentrated load moments:

First: Calculate loads and reactions on slab strip 1'0" wide.

Second: Determine point of maximum moment (point of zero shear).

Third: Calculate moments.

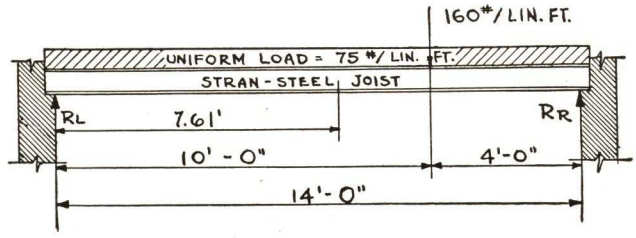
Fourth: Calculate spacing of joists to satisfy maximum moment conditions.

Fifth: Check end reaction for joist spacing selected.

Live load	= 40#/sq. ft.
2" conc. slab	= 24#/sq. ft.
Joist	= 3#/sq. ft.
Lath and plaster	= 8#/sq. ft.
Total load	= 75#/sq. ft.

Partition load = 160 lb. per foot of slab width.

(1) Reaction R_L = 160 × 4 ÷ 14 = 46
75 × 14 ÷ 2 = 525
Total R_L 571#



Reaction R_R = 160 × 10 ÷ 14 = 114
75 × 14 ÷ 2 = 525
Total R_R 639#

(2) Point of zero shear (point of maximum moment) = 571# ÷ 75#/′ = 7.61′

(3) Max. mom. = $571\# \times 7.61' - 75 \times \frac{7.61^2}{2}$
= 4345 − 2172
= 2173 ′ #
= 26076 " #

(4) Resisting moment of 8"—13 ga. joist = 54505 "#
Space 8"—13 ga. joist @ $\frac{54505}{26076}$ = 2.09′ o.c. or 24" o.c.

(5) Maximum reaction of joist = 639# × 2′ = 1278# (2 ft. on center)
Allowable reaction = 2400#

ALLOWABLE TOTAL LOADS IN POUNDS PER LINEAR FOOT OF STRAN-STEEL JOIST

Depth	6	6	6	8	8	8	8	8	9	9	9	9	9
Gauge	16	14	13	16	14	13	12	11	16	14	13	12	11
Wt. per Ft.	2.696	3.339	4.016	3.121	3.870	4.654	5.327	6.122	3.333	4.135	4.983	5.719	6.547
Res. Mom.	23560	29125	34615	36990	45810	54505	63000	71335	43975	54485	64890	75040	85015
Max. End Reaction	1300	1625	1950	1600	2000	2400	2800	3200	1750	2190	2630	3060	3500
4′ 0″	650			800									
5′ 0″	520			640									
6′ 0″	433			533									
7′ 0″	321	396		457									
8′ 0″	246	303	361	386	475	568	656	743					
9′ 0″	194	240	285	304	377	449	518	587	362	448	534	618	698
10′ 0″	157	194	231	247	305	364	420	476	293	363	433	501	567
11′ 0″	130	160	191	204	252	300	347	393	242	300	358	414	469
12′ 0″	109	135	160	171	212	253	292	330	204	252	292	348	394
13′ 0″				146	181	215	248	282	173	215	254	296	335
14′ 0″				126	156	185	214	243	150	185	221	256	289
15′ 0″				110	136	162	187	211	130	161	192	222	252
16′ 0″				96	119	142	164	186	114	142	169	195	222
17′ 0″									101	126	150	173	196
18′ 0″									90	112	133	154	175

STRAN-STEEL JOIST LOADING TABLE

The following table gives the total safe uniformly distributed load carrying capacities of STRAN-STEEL joists at various spacings. The weight of dead loads must in all cases be deducted to determine the live-load-carrying capacities of the joists.

CLEAR SPAN	JOIST TYPE	TOTAL SAFE LOAD	CENTER TO CENTER OF JOISTS				
			12″	16″	18″	20″	24″
4′-0″	6″-16 Ga.	2600	650	488	433	390	325
	8″-16 Ga.	3200	800	600	533	480	400
4′-6″	6″-16 Ga.	2600	578	434	385	347	289
	8″-16 Ga.	3200	711	533	474	427	356
5′-0″	6″-16 Ga.	2600	520	390	347	312	260
	8″-16 Ga.	3200	640	480	427	384	320
5′-6″	6″-16 Ga.	2600	473	355	315	284	237
	8″-16 Ga.	3200	582	437	388	349	291
6′-0″	6″-16 Ga.	2600	433	325	289	260	217
	8″-16 Ga.	3200	533	400	355	320	267
6′-6″	6″-16 Ga.	2415	372	279	248	223	186
	8″-16 Ga.	3200	492	369	328	295	246
7′-0″	6″-16 Ga.	2245	321	241	214	193	161
	6″-14 Ga.	2775	396	297	264	238	198
	8″-16 Ga.	3200	457	343	305	274	229
7′-6″	6″-16 Ga.	2095	279	209	186	167	140
	6″-14 Ga.	2590	345	259	230	207	173
	8″-16 Ga.	3200	427	320	285	256	214
8′-0″	6″-16 Ga.	1965	246	185	164	148	123
	6″-14 Ga.	2425	303	227	202	182	152
	6″-13 Ga.	2885	361	271	241	217	181
	8″-16 Ga.	3085	386	290	257	232	193
	8″-14 Ga.	3815	475	356	317	285	238
	8″-13 Ga.	4545	568	426	379	341	284
	8″-12 Ga.	5250	656	492	437	394	328
	8″-11 Ga.	5945	743	557	495	446	372
8′-6″	6″-16 Ga.	1850	217	163	145	130	109
	6″-14 Ga.	2285	269	202	179	161	135
	6″-13 Ga.	2715	319	239	213	191	160
	8″-16 Ga.	2910	342	257	228	205	171
	8″-14 Ga.	3605	424	318	283	254	212
	8″-13 Ga.	4290	505	379	337	303	253
	8″-12 Ga.	4960	584	438	389	350	292
	8″-11 Ga.	5615	661	496	441	397	331
9′-0″	6″-16 Ga.	1745	194	146	129	116	97
	6″-14 Ga.	2155	240	180	160	144	120
	6″-13 Ga.	2565	285	214	190	171	143
	8″-16 Ga.	2740	304	228	203	182	152
	8″-14 Ga.	3390	377	283	251	226	189
	8″-13 Ga.	4040	449	337	299	269	225
	8″-12 Ga.	4665	518	389	345	311	259
	8″-11 Ga.	5285	587	440	391	352	294
	9″-16 Ga.	3255	362	272	241	217	181
	9″-14 Ga.	4035	448	336	299	269	224
	9″-13 Ga.	4805	534	401	356	320	267
	9″-12 Ga.	5560	618	463	412	370	309
	9″-11 Ga.	6295	698	524	465	419	349
9′-6″	6″-16 Ga.	1655	174	131	116	104	87
	6″-14 Ga.	2045	215	161	143	129	108
	6″-13 Ga.	2430	256	192	171	154	128
	8″-16 Ga.	2600	274	206	183	164	137
	8″-14 Ga.	3225	339	254	226	203	170
	8″-13 Ga.	3840	404	303	269	242	202
	8″-12 Ga.	4435	467	350	311	280	234
	8″-11 Ga.	5020	528	396	352	317	264
	9″-16 Ga.	3095	326	245	217	196	163
	9″-14 Ga.	3835	404	303	269	242	202
	9″-13 Ga.	4565	481	361	321	289	241
	9″-12 Ga.	5280	556	417	371	334	278
	9″-11 Ga.	5980	630	473	420	378	315
10′-0″	6″-16 Ga.	1570	157	118	105	94	79
	6″-14 Ga	1940	194	146	129	116	97
	6″-13 Ga.	2310	231	173	154	139	116
	8″-16 Ga.	2465	247	185	165	148	124
	8″-14 Ga.	3055	306	230	204	184	153
	8″-13 Ga.	3635	364	273	243	218	182

CLEAR SPAN	JOIST TYPE	TOTAL SAFE LOAD	CENTER TO CENTER OF JOISTS				
			12″	16″	18″	20″	24″
10′-0″—Cont.	8″-12 Ga.	4200	420	315	280	252	210
	8″-11 Ga.	4755	476	357	317	286	238
	9″-16 Ga.	2930	293	220	195	176	147
	9″-14 Ga.	3630	363	272	242	218	182
	9″-13 Ga.	4325	433	325	289	260	217
	9″-12 Ga.	5005	501	376	334	301	251
	9″-11 Ga.	5665	567	425	378	340	283
10′-6″	6″-16 Ga.	1495	142	107	95	85	71
	6″-14 Ga.	1850	176	132	117	106	88
	6″-13 Ga.	2200	209	157	139	125	105
	8″-16 Ga.	2355	224	168	149	134	112
	8″-14 Ga.	2915	278	209	185	167	139
	8″-13 Ga.	3470	330	248	220	198	165
	8″-12 Ga.	4010	382	287	255	229	191
	8″-11 Ga.	4540	432	324	288	259	216
	9″-16 Ga.	2800	267	200	178	160	134
	9″-14 Ga.	3465	330	248	220	198	165
	9″-13 Ga.	4125	393	295	262	236	196
	9″-12 Ga.	4780	455	341	304	273	228
	9″-11 Ga.	5410	515	386	343	309	257
11′-0″	6″-16 Ga.	1430	130	98	87	78	65
	6″-14 Ga.	1765	160	120	107	96	80
	6″-13 Ga.	2100	191	143	127	115	96
	8″-16 Ga.	2240	204	153	136	122	102
	8″-14 Ga.	2775	252	189	168	151	126
	8″-13 Ga.	3305	300	225	200	180	150
	8″-12 Ga.	3820	347	260	231	208	174
	8″-11 Ga.	4325	393	295	262	236	197
	9″-16 Ga.	2665	242	182	161	145	121
	9″-14 Ga.	3300	300	225	200	180	150
	9″-13 Ga.	3935	358	269	239	215	179
	9″-12 Ga.	4550	414	310	276	248	207
	9″-11 Ga.	5150	469	352	313	282	234
11 -6″	6″-16 Ga.	1365	119	89	79	71	60
	6″-14 Ga.	1690	147	110	98	88	74
	6″-13 Ga.	2005	175	131	117	105	88
	8″-16 Ga.	2150	187	140	125	112	94
	8″-14 Ga.	2660	231	173	154	139	116
	8″-13 Ga.	3170	276	207	184	166	138
	8″-12 Ga.	3660	318	239	212	191	159
	8″-11 Ga.	4145	360	270	240	216	180
	9″-16 Ga.	2555	222	167	148	133	111
	9″-14 Ga.	3165	275	206	183	165	138
	9″-13 Ga.	3770	328	246	219	197	164
	9″-12 Ga.	4360	379	284	253	227	189
	9″-11 Ga.	4935	429	322	386	257	214
12′-0″	6″-16 Ga.	1310	109	82	73	65	55
	6″-14 Ga.	1620	135	101	90	81	68
	6″-13 Ga.	1925	160	120	107	96	80
	8″-16 Ga.	2055	171	128	114	103	86
	8″-14 Ga.	2545	212	159	141	127	106
	8″-13 Ga.	3030	253	190	169	152	127
	8″-12 Ga.	3500	292	219	195	175	146
	8″-11 Ga.	3965	330	248	220	198	165
	9″-16 Ga.	2445	204	153	136	122	102
	9″-14 Ga.	3025	252	189	168	151	126
	9″-13 Ga.	3605	292	219	195	175	146
	9″-12 Ga.	4170	348	261	232	208	174
	9″-11 Ga.	4720	394	298	263	236	197
12′-6″	8″-16 Ga.	1975	158	119	105	95	79
	8″-14 Ga.	2450	196	147	131	118	98
	8″-13 Ga.	2915	233	175	155	140	117
	8″-12 Ga.	3365	269	202	179	161	135
	8″-11 Ga.	3815	305	229	203	183	153
	9″-16 Ga.	2350	188	141	125	113	94
	9″-14 Ga.	2910	233	175	155	140	117
	9″-13 Ga.	3455	276	207	184	166	138
	9″-12 Ga.	4010	321	241	214	193	160
	9″-11 Ga.	4540	363	272	242	218	181
13′-0″	8″-16 Ga.	1895	146	110	97	88	73
	8″-14 Ga.	2350	181	136	121	109	91
	8″-13 Ga.	2795	215	161	143	129	108
	8″-12 Ga.	3230	248	186	165	149	124
	8″-11 Ga.	3660	282	212	188	169	141
	9″-16 Ga.	2255	173	130	115	104	87
	9″-14 Ga.	2795	215	161	143	129	108
	9″-13 Ga.	3300	254	191	169	153	127
	9″-12 Ga.	3850	296	222	197	178	148
	9″-11 Ga.	4360	335	251	223	201	167

CLEAR SPAN	JOIST TYPE	TOTAL SAFE LOAD	CENTER TO CENTER OF JOISTS				
			12″	16″	18″	20″	24″
13′-6″	8″-16 Ga.	1830	136	102	91	82	68
	8″-14 Ga.	2265	168	126	112	101	84
	8″-13 Ga.	2695	200	150	133	120	100
	8″-12 Ga.	3115	231	173	154	139	116
	8″-11 Ga.	3530	261	196	174	157	131
	9″-16 Ga.	2175	161	121	107	97	81
	9″-14 Ga.	2695	200	150	133	120	100
	9″-13 Ga.	3195	237	178	158	142	119
	9″-12 Ga.	3715	275	206	183	165	138
	9″-11 Ga.	4205	312	234	208	187	156
14′-0″	8″-16 Ga.	1760	126	95	84	76	63
	8″-14 Ga.	2180	156	117	104	94	78
	8″-13 Ga.	2595	185	139	123	111	93
	8″-12 Ga.	3000	214	161	143	128	107
	8″-11 Ga.	3395	243	182	162	146	122
	9″-16 Ga.	2095	150	113	100	90	75
	9″-14 Ga.	2595	185	139	123	111	93
	9″-13 Ga.	3090	221	166	147	133	110
	9″-12 Ga.	3575	256	192	171	153	128
	9″-11 Ga.	4045	289	217	193	173	144
14′-6″	8″-16 Ga.	1705	118	89	79	71	59
	8″-14 Ga.	2110	146	110	97	88	73
	8″-13 Ga.	2510	173	130	115	104	87
	8″-12 Ga.	2900	200	150	133	120	100
	8″-11 Ga.	3285	227	170	151	136	114
	9″-16 Ga.	2025	140	105	93	84	70
	9″-14 Ga.	2510	173	130	115	104	87
	9″-13 Ga.	2990	206	154	137	124	103
	9″-12 Ga.	3455	238	179	159	143	119
	9″-11 Ga.	3910	270	202	180	162	135
15′-0″	8″-16 Ga.	1645	110	83	73	66	55
	8″-14 Ga.	2035	136	102	91	82	68
	8″-13 Ga.	2425	162	122	108	97	81
	8″-12 Ga.	2800	187	140	125	112	94
	8″-11 Ga.	3170	211	158	141	127	106
	9″-16 Ga.	1955	130	98	87	78	65
	9″-14 Ga.	2420	161	121	107	97	81
	9″-13 Ga.	2885	192	144	128	115	96
	9″-12 Ga.	3335	222	167	148	133	111
	9″-11 Ga.	3775	252	189	168	151	126
15′-6″	8″-16 Ga.	1595	103	77	69	62	52
	8″-14 Ga.	1970	127	95	85	76	64
	8″-13 Ga.	2350	152	114	101	91	76
	8″-12 Ga.	2715	175	131	117	105	87
	8″-11 Ga.	3075	198	149	132	119	99
	9″-16 Ga.	1895	122	92	81	73	61
	9″-14 Ga.	2345	151	113	101	91	76
	9″-13 Ga.	2795	180	135	120	108	90
	9″-12 Ga.	3230	208	156	139	125	104
	9″-11 Ga.	3660	236	177	157	142	118
16′-0″	8″-16 Ga.	1540	96	72	64	58	48
	8″-14 Ga.	1905	119	89	79	71	60
	8″-13 Ga.	2270	142	107	95	85	71
	8″-12 Ga.	2625	164	123	109	98	82
	8″-11 Ga.	2975	186	140	124	112	93
	9″-16 Ga.	1830	114	86	76	68	57
	9″-14 Ga.	2270	142	107	95	85	71
	9″-13 Ga.	2705	169	127	113	101	84
	9″-12 Ga.	3125	195	146	130	117	97
	9″-11 Ga.	3540	222	166	148	133	111
16′-6″	9″-16 Ga.	1780	108	81	72	65	54
	9″-14 Ga.	2205	134	101	89	80	67
	9″-13 Ga.	2625	159	119	106	95	79
	9″-12 Ga.	3035	184	138	123	110	92
	9″-11 Ga.	3435	208	156	139	125	104
17′-0″	9″-16 Ga.	1725	101	76	67	61	51
	9″-14 Ga.	2135	126	95	84	76	63
	9″-13 Ga.	2545	150	113	100	90	75
	9″-12 Ga.	2945	173	130	115	104	86
	9″-11 Ga.	3330	196	147	131	118	98
17′-6″	9″-16 Ga.	1680	96	72	64	58	48
	9″-14 Ga.	2075	118	89	79	71	59
	9″-13 Ga.	2475	141	106	94	85	70
	9″-12 Ga.	2865	164	123	109	98	82
	9″-11 Ga.	3240	185	139	123	111	92
18′-0″	9″-16 Ga.	1630	90	68	60	54	46
	9″-14 Ga.	2015	112	84	75	67	56
	9″-13 Ga.	2405	133	100	89	80	66
	9″-12 Ga.	2780	154	115	103	92	77
	9″-11 Ga.	3145	175	131	117	105	87

STRAN-STEEL *Specifications*

AND RECOMMENDATIONS SUGGESTED AS A GUIDE TO SPECIFICATION WRITERS

WORK INCLUDED—Shall be the furnishing and erection of the entire building frame composed of steel members manufactured by the Great Lakes Steel Corporation, STRAN-STEEL Division, 607 Shelby Street, Detroit, Mich., as described in their handbook.

ERECTION OF FRAME—Shall be done by skilled mechanics in a substantial, workmanlike manner, true to line, level and plumb, in accordance with the manufacturer's specifications and recommendations.

SHOP PAINTING—All framing members shall be given a coat of special rust-resisting paint at the shop.

JOISTS—Joists throughout shall be of sizes recommended by the manufacturer. Spacing in general shall be 24″ on centers. Double all joists or provide heavier gauge single joists of proper carrying capacity under partitions and around all floor openings for stairs, chimneys, etc. Double joists shall be fastened together with C-clips.

JOIST HANGERS—Provide joist hangers for the support of headers and trimmers and for the support of all tail joists over 5′ 0″.

CROSS BRIDGING—Provide standard self-locking channel-section bridging, one row for spans up to 7′0″, two rows for spans up to 14′0″, three rows for spans over 14′0″.

PARTITION SUPPORTS—Where partitions running parallel to the joists are not directly supported by a joist, provide half stud partition supports spanning between two joists centered under and supporting each stud of the partition (24″ on centers).

CHANNEL PLATES—Channel plates to fit studs shall be provided as sills and plates for all exterior wall studding, all interior partitions, and elsewhere where required. Channels shall be lapped and fastened with two (2) screws at all corners.

STUDDING—Studs generally spaced 24″ on centers shall be provided for all exterior walls and interior partitions and shall be secured to sills and plates with four (4) screws each, two at top and two at bottom through diagonally opposite stud flanges. Provide jack studs between main wall sills and plates and window sills; between window and door lintels or headers and main wall plates above; for all gable walls; and wherever else required to provide nailing for enclosing exterior and interior wall material or finish. Provide studs to serve as jamb studs at all openings where main wall or partition stud spacing does not fulfill requirements.

OPENING SILLS AND HEADERS—Sill and headers shall be provided as required for all exterior and interior wall and partition openings, and headers shall be secured by header brackets.

PARTITION FURRING—To increase the thickness of partitions to accommodate pipes, ducts, etc., furr the main partition with half studs or standard $2\frac{5}{16}$″ studs, secured to narrow plates.

RAFTERS—Rafters shall be spaced 24″ apart on centers. Rafters shall consist of stud or joist members, depending on the span and loads supported. The heel of each rafter shall be secured at the wall to the wall plate, with an adjustable rafter hinge screwed to both rafter and plate. Rafters shall be secured to the ridge by cutting away adjacent lower flanges and bolting together through webs of rafters. Jack rafters shall be secured at heels as specified for main rafters and at hip and valley rafters with hip and valley collars and rafter plates.

COLLAR TIES—Shall be provided to brace and tie rafters together where required. They shall consist of stud or plate members secured to the rafter by means of collar tie brackets or hip and valley collars.

STRUCTURAL STEEL AND LINTELS—Where required, shall be supplied, fully fabricated, by general contractor as a separate item, not included in the STRAN-STEEL bill of material.

ANCHOR BOLTS—Sills for exterior wall studding on masonry walls shall be secured to masonry with ½″ diameter hook bolts spaced 4′ apart on centers; anchor bolts to be furnished and built in by the masonry contractor.

MEMORANDA

ESTABLISHED 1897

LALLY COLUMN COMPANY

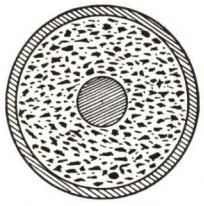
CAMBRIDGE, MASS.

FACTORIES

CHICAGO, ILL., 733 West 64th Street — CAMBRIDGE, MASS., Erie and Albany Streets — BROOKLYN, N. Y., 211-249 Lombardy Street

CONCRETE FILLED COLUMNS

Lally Column Company Are Originators and Patentees of "Genuine Lally Columns"



Rod Reinforcement

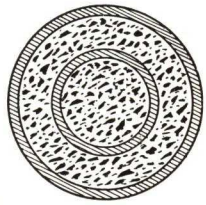
Specification

Lally Columns—All Concrete Filled Steel Columns indicated on the plans shall be genuine Lally Columns as made by the LALLY COLUMN COMPANIES.

*

SERVICE

Architectural service is maintained at the various offices of the company. Advice on all types of column construction. Handbook will be mailed upon request.



Fireproofed Column

The Product

Lally Columns are special shop made units, cut to lengths required, fitted with specially designed connections for wood, steel or concrete beams and delivered on the job ready for erection.

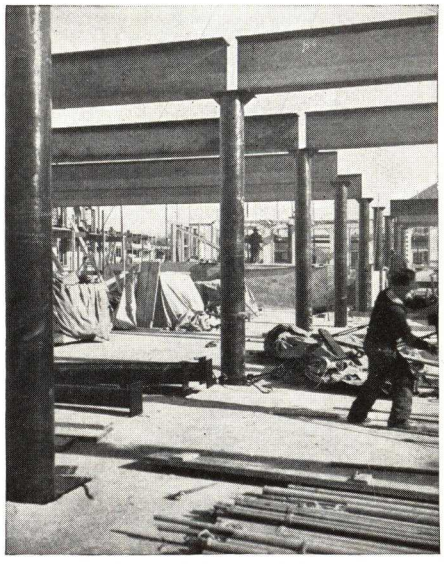
The shell is mild black steel pipe. The filling is 1:1½:3 concrete, with a proper water content, and is deposited and electrically agitated in the most approved modern manner.

We are pioneers in the manufacture of concrete filled columns and our manufacturing processes are the result of over 40 years' experimenting.

Resistance to Fire

After the most serious conflagrations in Eastern United States of recent years, Lally Columns have been observed standing straight and unharmed.

We are justly proud of the performance of Lally Columns in these cases and of the fact that Lally Columns are specified for use by architects and engineers in both public and private practice throughout Eastern and Central United States.



Fireproofed Store Columns

Fireproofed Columns

The standard section Lally Column is often fireproofed as illustrated by enclosing it in an outer shell generally two or more sizes larger, according to local building laws. Area between shells one inch or more, is then filled with concrete in the regular manner. This type column is extensively used where free standing columns are required to be fireproofed, as in stores, warehouses, schools, or fireproof garages. The Lally Column is the only complete fireproofed column furnished ready for erection.

Multi-story Construction Using Lally Continuous Columns

Genuine Lally Columns are becoming increasingly popular for use in buildings of over one-story height, and of the type usually referred to as "wall-bearing" of either fireproof or non-fireproof construction. In these cases they are chosen for their ready adaptability to conditions. Our patented *web-plate* connections are customarily used on this type of work. The *web-plates* pass completely through the shell and concrete and, in addition, are thoroughly welded to the shell. Bolts of special steel with hot pressed heads and short thread to allow for a full bearing on the shank are furnished for this type connection.

Safe Loads

This safe load table was developed from official tests made at Columbia University and Watertown Arsenal. The tests show that the strength of the composite section far exceeds the sum of the strengths of the two elements and that the column behaves as a true laterally restrained composite concrete-steel section.

When a project is designed for Lally Columns according to the strength table shown below no other concrete filled columns should be substituted unless the sizes are increased to a diameter that will be equal in capacity to the genuine Lally Column.

SAFE LOADS FOR LALLY CONCRETE FILLED COLUMNS IN THOUSANDS OF POUNDS

Limit of Length = 40 Diameters ($l/r = 120$) $P = (Ac + 12\ As)\ (1600 - 24\ l/d)$

Diam. of col., in.		Weight per ft., lb.	Area of steel, sq. in.	Area of concrete, sq. in.	Unbraced length of column in feet															*Max. length,ft.
					6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Light weight	3½	13	1.27	8.35	26.1	24.2	22.2	20.3	18.3	16.4	14.5									11.91
	4	17	1.63	10.94	35.6	33.4	31.2	29.0	26.8	24.6	22.4	20.2								13.71
Heavy weight	3½	15	2.23	7.39	37.9	35.1	32.3	29.4	26.7	24.0										11.64
	4	20	2.68	9.89	49.2	46.1	43.1	40.1	37.0	33.9	30.9	27.9								13.37
	4½	24	3.17	12.73	61.8	58.5	55.3	52.0	48.8	45.5	42.3	39.0	35.8	32.5						15.10
	5	29	3.69	15.95	75.6	72.0	68.6	65.2	61.7	58.2	54.7	51.3	47.8	44.3	40.9	37.4				16.83
	5½	36	4.30	20.01	92.1	88.3	84.6	80.8	77.1	73.3	69.6	65.8	62.1	58.3	54.6	50.8	47.1	43.3		18.78
	6⅝	49	5.58	28.89	128.3	124.2	120.0	115.8	111.7	107.5	103.4	99.2	95.0	90.9	86.7	82.6	78.4	74.2	70.1	22.45
	7⅝	64	6.92	38.74	166.0	161.4	156.9	152.3	147.8	143.2	138.6	134.1	129.7	125.0	120.5	115.9	111.4	106.8	102.3	25.92
	8⅝	81	8.40	50.03	211.1	206.1	201.1	196.1	191.0	186.0	181.0	175.9	170.9	165.9	160.8	155.8	150.8	145.8	140.7	29.38
	9⅝	100	9.97	62.79	259.2	253.8	248.3	242.8	237.4	231.9	226.5	221.0	215.6	210.1	204.6	199.2	193.7	188.3	182.8	32.84
	10¾	123	11.91	78.86	319.1	313.1	307.2	301.3	295.4	289.4	283.5	277.6	271.6	265.7	259.7	253.8	247.9	241.9	236.0	36.74
	12¾	169	14.58	113.10	421.9	415.4	408.8	402.3	395.8	389.2	382.8	376.2	369.7	363.2	356.7	350.1	343.6	337.1	330.6	43.77

*Radius of gyration equals $\frac{1}{10}$ quantity in this column.

*This seal is affixed to every Genuine Lally Column

THE LITH-I-BAR COMPANY

LICENSERS

THE DEXTONE CO.
NEW HAVEN, CONN.

PRECAST UNIT COMPANY
KALAMAZOO, MICH.

FORMIGLI CORPORATION
PHILADELPHIA, PA.

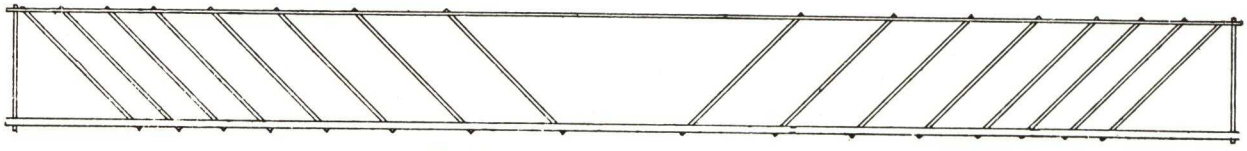
LITH-I-BAR PREFABRICATED, REINFORCED, FIREPROOF, CONCRETE JOISTS

Lith-I-Bar joists are designed to replace field cast joists and result in reduced cost and improved construction. A rigidly controlled production process insures a more uniform and reliable joist than can be formed under average field conditions.

The Lith-I-Bar joist is an assembly of a scientifically designed reinforcing member encased in concrete made with Haydite, the ideal light weight aggregate. This assembly is machine rolled under a pressure of 2000 lbs. per sq. in., producing a uniform dense mass perfectly bonded to the reinforcing unit.

Lith-I-Bar machine rolled concrete shows a compressive strength of over 4000 lbs. per sq. in. Haydite aggregate is used in most installations though the smaller sized joists are available in other materials.

The Lith-I-Bar Balanced Reinforcing Unit, illustrated below, is the result of intensive engineering research. Electrically welded throughout, the tension members conform to "standard specifications for billet-steel concrete reinforcing bars" (A.S.T.M. A-15-30), and the diagonal shear members to "standard specifications for cold drawn steel wire for concrete reinforcement" (A.S.T.M. A-82-34).



The Lith-I-Bar Balanced Reinforced Unit

LITH-I-BAR FEATURES

Economy

Lith-I-Bar construction shows a marked saving over other methods of fireproof construction because of the lower dead loads, the elimination of expensive centering and lower story height. Costly forms are not required and the cost of supervision may be reduced. With the wide range of standard Lith-I-Bar sizes and complete freedom possible in joist spacing, maximum economy and efficiency are attained. For many installations the finished appearance of Lith-I-Bar construction calls for no additional plaster finish.

Simplicity in Design

The work of the designer is simplified and safeguarded by the use of standardized units of predetermined strength. Because he is working with units of tested capacity and uniform dependability, the designer faces no hazard of field conditions which may limit the strength of his design, owing to improper steel placement or poor concrete.

Rigidity

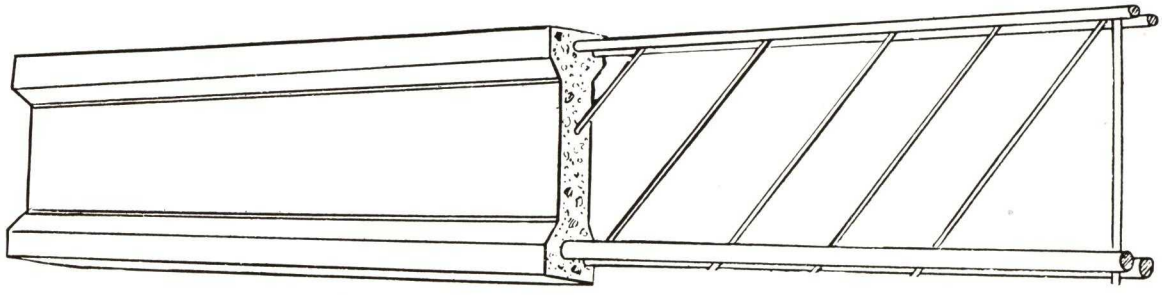
Lith-I-Bar slabs, in laboratory tests and in completed buildings, show the smallest deflection and freedom from vibration inherent in reinforced concrete construction, giving more rigid floors with a saving in story height.

Appearance

The perfection of finish and alignment achieved by machine fabrication of the joists eliminates the necessity for plastering in many classes of buildings.

Dependability

Lith-I-Bar joists afford a new measure of reliability in fireproof construction, replacing the uncertainties of field pouring and steel placement with the dependability of factory controlled production. Furthermore greater strength is developed by the rolling process during fabrication than is possible in field construction.



The Safe Economical Joist for Fireproof Construction

LITH-I-BAR IS ADAPTABLE TO A WIDE RANGE OF CONSTRUCTION

Lith-I-Bar joists are recommended for use as intermediate carrying members in all types of fireproof construction. Its adaptability has been demonstrated over a wide range of installations, including city halls, hospitals, schools, churches, public auditoriums, garages, factories, stores, warehouses, office buildings, apartments and residences. Installations have been made ranging from light residential construction to warehouses designed to carry loads of 600 lbs. per sq. ft. The pleasing appearance of Lith-I-Bar constructions recommends it for use in many installations where additional finishing cannot be afforded.

Fireproof Construction

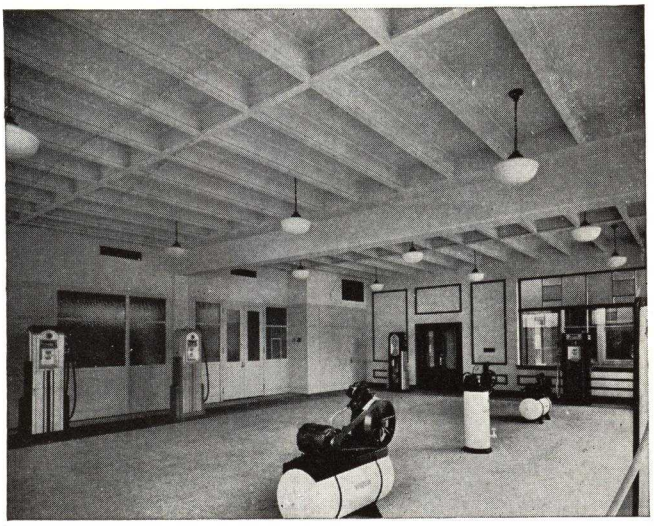
Lith-I-Bar light weight concrete provides fireproofing of the highest possible rating. The type of light weight aggregates used have been thoroughly tested and passed upon by the Bureau of Standards.

Engineering Service

The manufacturer offers the experience of his engineering staff for assistance to the designer in the solution of new or unusual problems in slab design, and in the supervision of installations. Complete setting drawings are furnished for the architect's approval and for the guidance of the foreman on the job. Every joist is marked to indicate its type, length and location.

Availability

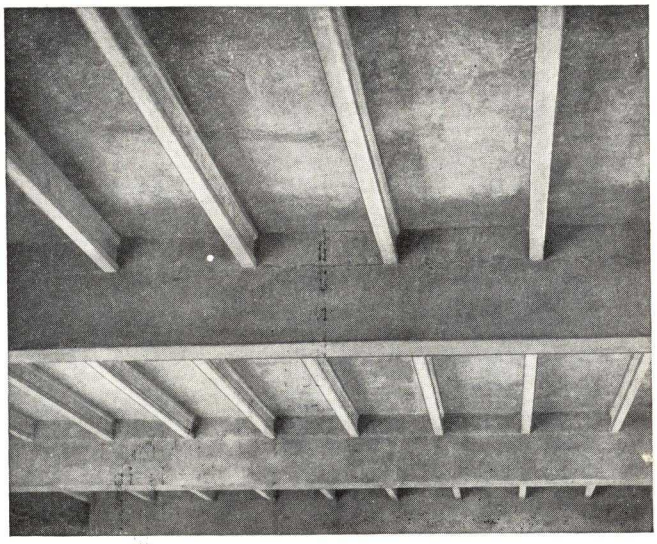
Stocks of materials are maintained by the companies shown on page 1, and fabrication and shipments are ordinarily made 10 days after receipt of order. Correspondence and orders should be addressed to the company nearest you.



Wayne Company, Fort Wayne, Ind.

Roosevelt High School, East Chicago, Ind.

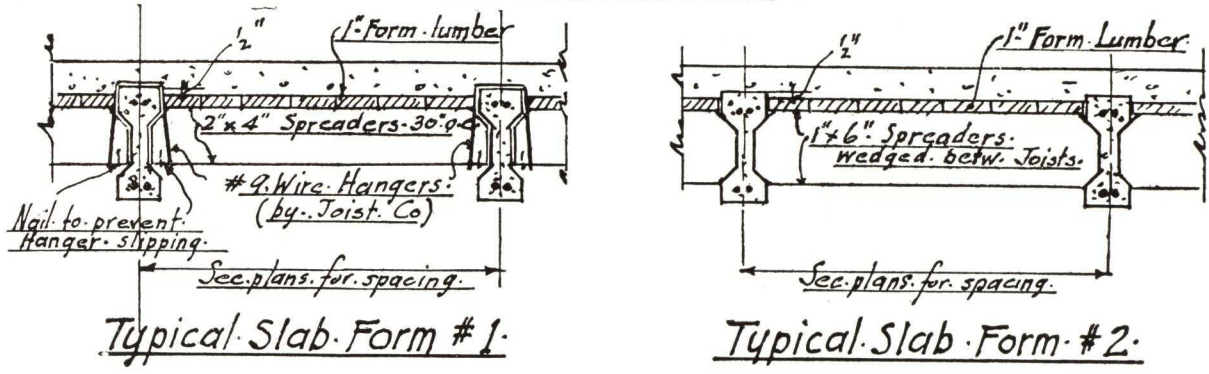
Blockson Mfg. Co., Michigan City, Ind.



Fifth Regiment Armory, Baltimore, Md.

For Construction Details and Selection Data, see Next Page

LITH-I-BAR FORM DETAIL



NOTES ON PLACING

(1) Set Lith-I-Bar joists according to setting plan on accompanying sheet.

(2) Place blocks or wall forms between joists at supports.

(3) Place suitable spreaders, as shown above between joists at approximately 30 in. o.c. and wedged in at ends and bottom to line up for floor form.

(4) Lay floor form lumber on top of spreaders—top to be ½ in. below top of joists—*See typical sections* above.

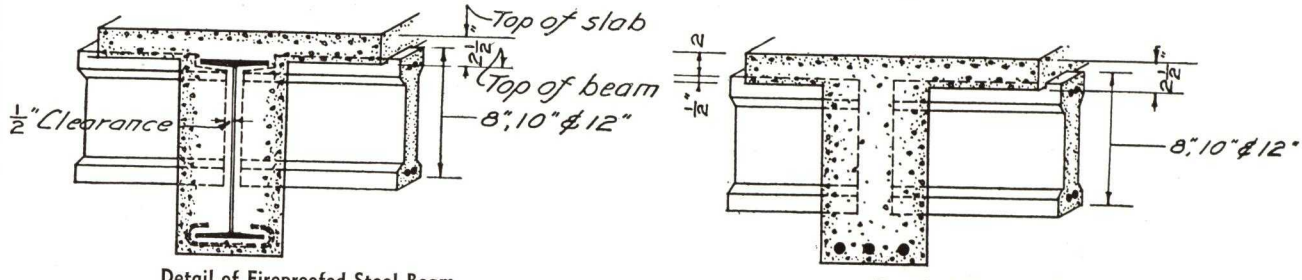
(5) Where joists and slabs are left exposed lay Masonite on 1 x 2-in. furring strips instead of form lumber or spreaders for smooth finish.

(6) Box out heat ducts and service connections. Place slab reinforcing of either welded wire mesh or deformed bars as specified. Place line of shores under center of spans 16 ft. or over when using 8-in. Lith-I-Bar joists—or 20 ft. and over when using 10- and 12-in. joists.

(7) Place concrete for slab.

(8) Strip slab forms after concrete has moist cured for 5 to 7 days. Shores to remain in place 7 to 10 days as decided by the architects.

DETAILS OF JOIST FRAMING INTO BEAMS



SPECIFICATION FOR FLOOR CONSTRUCTION

Lith-I-Bar Joists—Shall consist of machine rolled lightweight 4,000-lb. concrete, containing a reinforcing unit consisting of necessary bars of steel, top and bottom; of sizes as called for on drawings with stirrups spaced as required, the whole to be electrically welded into one unit.

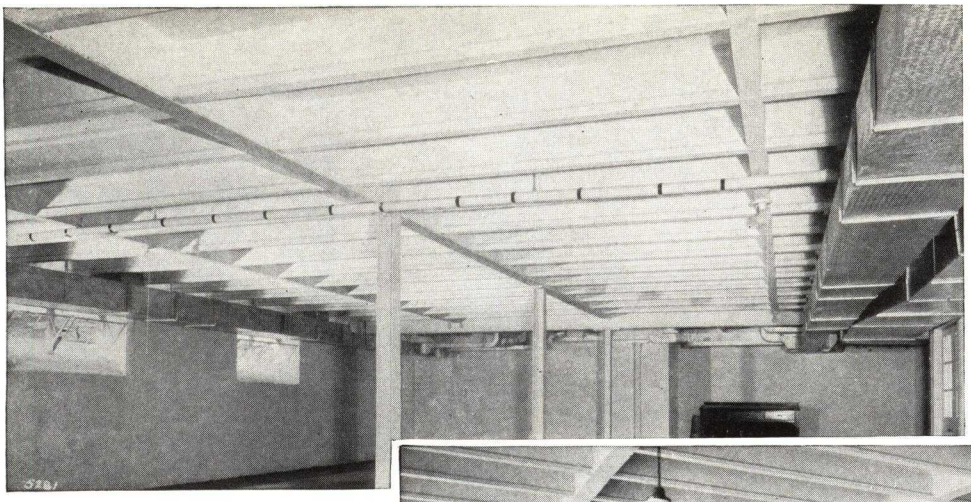
Placing Joists—Lith-I-Bar joists of lengths as required by floor panels, shall be laid plumb, having full bearing under each joist and spaced on centers as indicated on drawings.

Hangers for Ceilings—Where ceiling is indicated, place wire hangers over joists, cast tie-to inserts in bottom of joists or perforate joists with ¼-in. holes above bottom flange.

Forms—Forms shall be constructed as shown on plans using a 1-in. board for spacers and decking. Where no ceiling is indicated, use Masonite or other similar material for decking so as to obtain a smooth finish between joists.

Concrete—Slab shall be of thickness as called for on drawing with proper reinforcements of size and centers as indicated. Concrete slab to be finished straight and true, to be floated smooth to properly receive the type of floor finish specified. The floor slab to be poured integrally with beam concrete or steel beam fireproofing and wall supports and shall be a 1:2:4 concrete mixture.

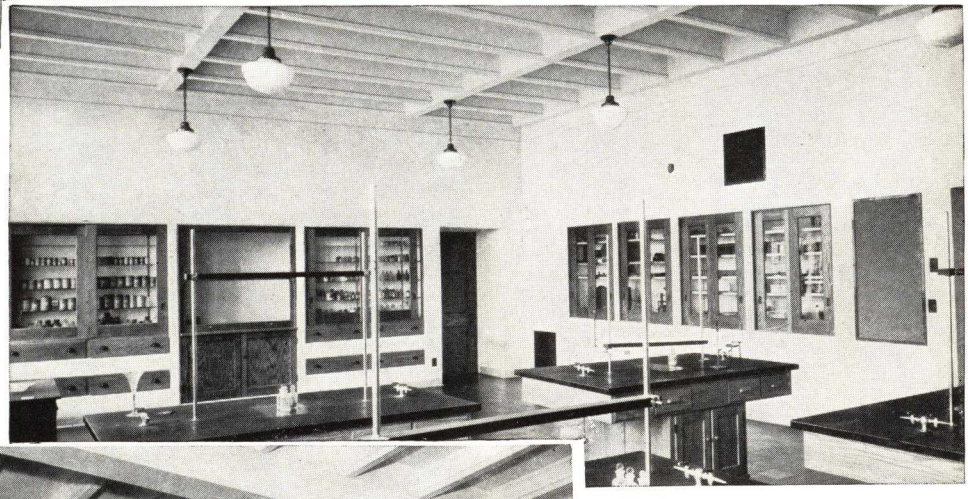
Slab Reinforcing Steel—Place ¼-in. bars or equivalent electric welded mesh reinforcement as specified on drawings.



Left:

First Church of Christ, Scientist, Jenkintown, Pa.

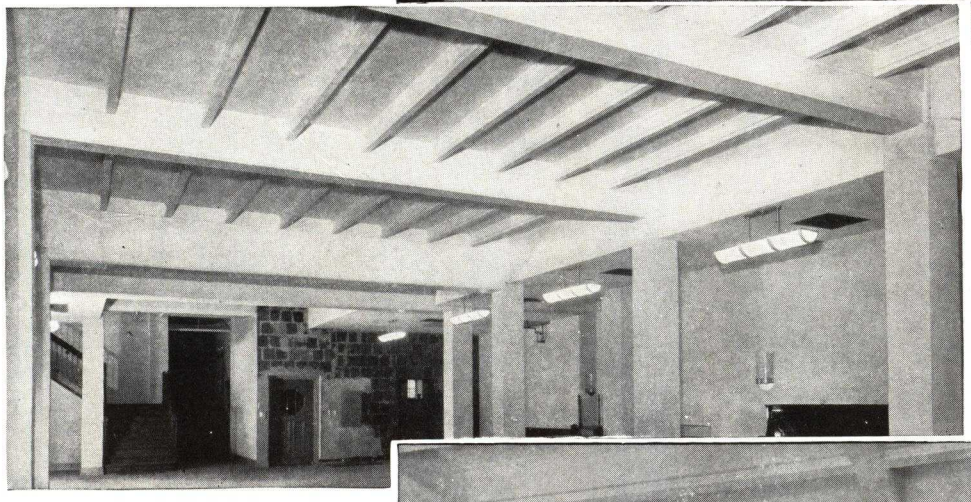
W. Pope Barney, Architect.



Right:

School, Matawan, Mich.

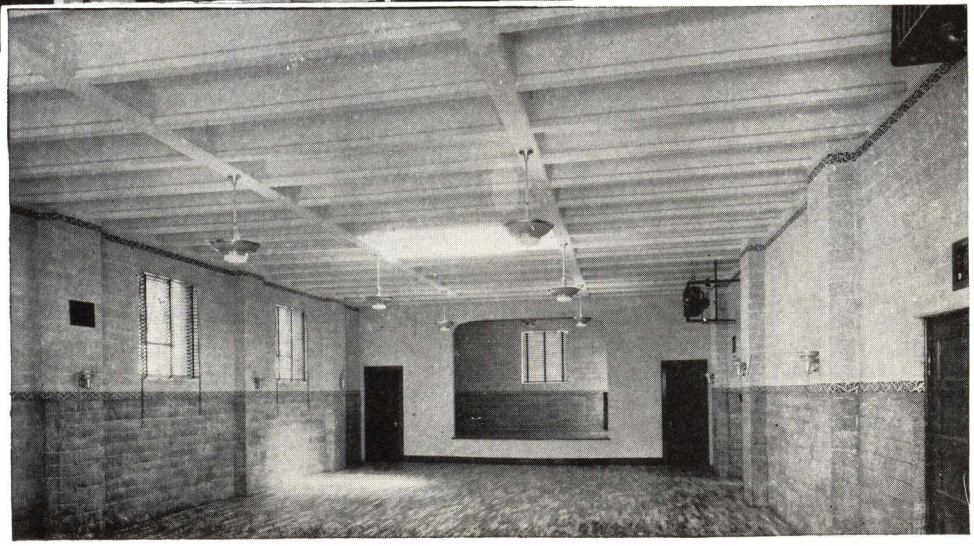
Stewart & Kingscott, Architects



Left:

St. Joseph's Home Meadowbrook, Pa.

Eugene Stopper, Architect



Right:

Citizens' Club, New Haven, Conn.

Harry S. Cannici, Architect

REPUBLIC FIREPROOFING COMPANY, INC.

Slagblok Fireproof Floor Construction

GENERAL OFFICES
31 Union Square, NEW YORK, N. Y.

Product

REPUBLIC SLAGBLOK FLOOR SYSTEM, consisting of Slagblok units and steel bar reinforcement for concrete fireproof floor construction.

Experience

Service and materials have been furnished in connection with Republic Slagblok Floors for more than 1500 buildings.

REPUBLIC SLAGBLOK FLOOR SYSTEM

Construction

Republic Slagblok Floors consist of pre-cast slag-concrete units in combination with poured reinforced concrete ribs for use both as floor and roof slabs.

Units composed of two blocks (see detail below) placed with open sides together, measure 16x16 in. and are placed on forms, usually on 20-in. centers allowing for ribs 4-in. wide to run parallel to the supports in both directions.

The detail shows the simplest form of slab construction in which concrete ribs are poured flush with the top of the blocks. Factors entering into the design, however, frequently necessitate a topping of concrete, poured with the ribs, over the entire slab surface. A monolithic topping of this description may be left rough for fill and finish or trowelled smooth to receive carpets, linoleum or other finished floor surfaces.

Design

The Slagblok units, made of slag-concrete, are produced under a special patented process giving them a high compressive strength and a perfect bonding quality with the concrete poured around them. In the design, therefore, the net area of the blocks is considered as a structural part of the slab for both "one-way" and "two-way" construction. The latter, under ordinary conditions, is the more economical.

Complete design information will be furnished on request.

Approval

Slagblok construction has been approved by the principal cities in the East, including New York, Boston, Washington, New Haven, Hartford, Albany, Syracuse, Rochester.

Advantages

Flat Ceilings—The wide variety of panel sizes which may be designed economically with Slagblok construction include all the usual room sizes ranging upward to spans encountered in the large classrooms of school buildings. Clear spans within the rooms are assured by locating beams at the partitions.

Reduced Story Heights—As all materials entering into the construction of Slagblok floors perform actual work, the System will allow for as shallow a slab as can be employed for a given span. Compared to other types of construction, Slagblok floors provide either increased ceiling heights or decreased story heights with proportional economies in masonry, stairs and mechanical work. In a tall building, the gain is frequently sufficient to allow for an additional story within the same building height.

Saving in Plaster—Slagblok floors offer a definite saving of plaster, in comparison with short span construction, by eliminating the intermediary beams and the corresponding arrises and beam sides and, in comparison with ribbed slab construction, by the omission of metal lath and the use of thinner plaster applied directly to the underside of the slab without any special provision for bonding. A two coat plaster gives satisfactory results on Slagblok ceilings.

As the Slagblok is of the same nature and color as the concrete ribs, the finished ceiling will always present a uniform appearance when the standard requirements of good plastering are followed.

Flexibility in Providing for Mechanical Work—Because the System is well adapted to the use of a monolithic finish, pipes, conduits, underfloor ducts, etc., may be easily installed in the slab by incorporating them in the concrete ribs which run in both directions or by substituting shallower blocks or omitting blocks entirely to provide additional depth as required.

Rigidity—The two-way reinforcement of Slagblok floors both provides for the lateral distribution of loads and forces and increases the capacity for concentrated loads.

Equal Resistance to Negative and Positive Moments—As a distinctive feature of the Slagblok System, equal resistance to negative and positive moments is obtained through the use of equal wall thicknesses for the tops and bottoms of the blocks.

No Uncertainty of Concrete Quantities—All Slagblok units being completely closed, the quantities of poured concrete are independent of the consistency of the concrete.

Cost

Installed costs per square foot will vary with spans, loads, etc., but compare very favorably with other types of fireproof floor construction.

Service

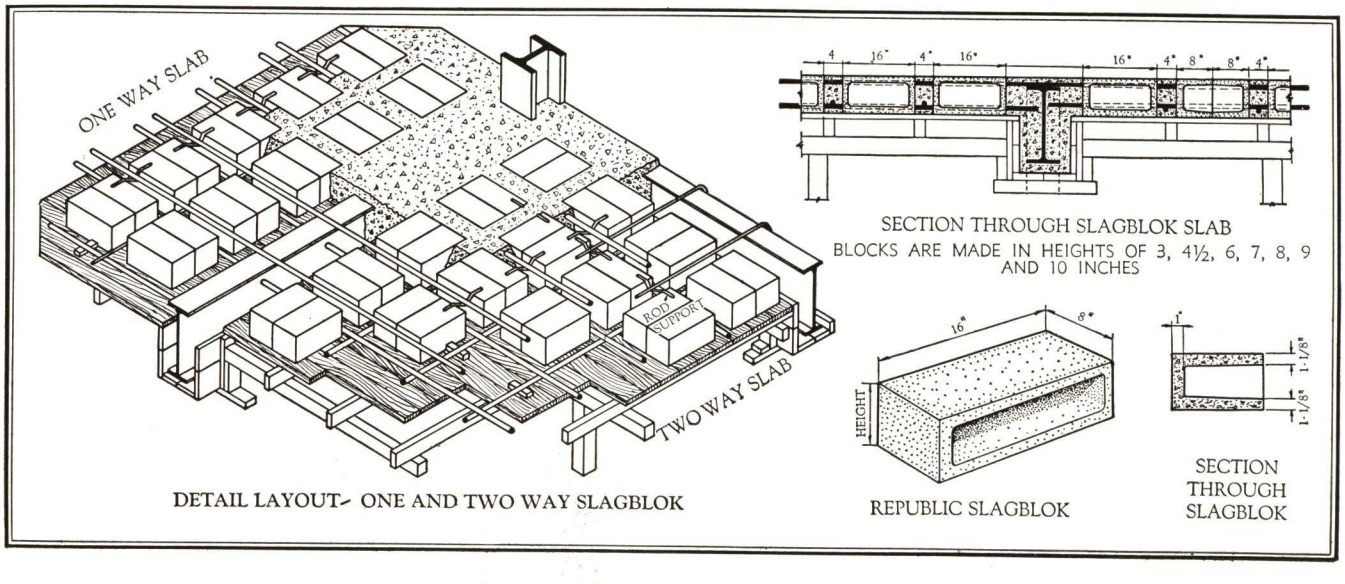
The REPUBLIC FIREPROOFING COMPANY, INC., does not contract for installation. The company sells the Slagblok units and the reinforcing bars for slabs, beams, and columns; provides, without extra charge, all working drawings in connection therewith, and also furnishes such inspection service in the field as may be deemed necessary for the satisfaction and protection of all concerned.

The engineering staff is available at any time for consultation regarding the use of the Slagblok System and will furnish estimates on prospective operations.

Notable Installations

BUILDING AND ARCHITECT

National Gallery of Art, Washington, D. C., Office of John Russell Pope
Waldorf-Astoria Hotel, New York, N. Y., Schultze & Weaver
F. W. Woolworth Co. Store, New York, N. Y., Starrett & Van Vleck
Columbus School, South Norwalk, Conn., Visscher & Burley
City Bank-Farmers Trust Co., New York, N. Y., Cross & Cross
The Corning Building, New York, N. Y., William & Geoffrey Platt
Trinity College, Hartford, Conn., McKim, Mead & White
Federal Office Building, New York, N. Y., Cross & Cross
Dudley District School, Boston, Mass., M. A. Dyer Company
Christian Brothers Academy, Albany, N. Y., O'Connor & Delany
Bergen Pines Sanatorium, Paramus, N. J., C. V. R. Bogert



DETAIL LAYOUT- ONE AND TWO WAY SLAGBLOK

SECTION THROUGH SLAGBLOK SLAB

BLOCKS ARE MADE IN HEIGHTS OF 3, 4½, 6, 7, 8, 9 AND 10 INCHES

REPUBLIC SLAGBLOK

SECTION THROUGH SLAGBLOK

ROBERTS AND SCHAEFER COMPANY

Engineers and Contractors

Wrigley Building, CHICAGO, ILLINOIS

REPRESENTATIVES IN PRINCIPAL CITIES OF UNITED STATES AND CANADA

"BARREL SHELL ROOFS" AND "SHELL DOMES"

"Z-D" SYSTEM OF PERMANENT MONOLITHIC REINFORCED CONCRETE CONSTRUCTION

Z-D Shell Roofs have been in use for many years, and several million square feet of them, striking examples of their large possibilities, may be found.

"Shell Roofs" are so-called because of their similarity to the shells found in nature. A Shell Dome is comparable to a half of a gigantic walnut shell or egg shell, the strengths of which are well known. An idea of a Barrel Shell Roof can be obtained by imagining a long metal cylinder with closed ends, such as a steam boiler, cut longitudinally through the middle, and the half sections resting horizontally on columns at the four corners.

Z-D shell structures are rigid and strong and have excellent structural properties, which are explained by the fact that loads are transmitted largely by direct stresses, viz., tension and compression only.

A Few Uses for "Z-D" Structures

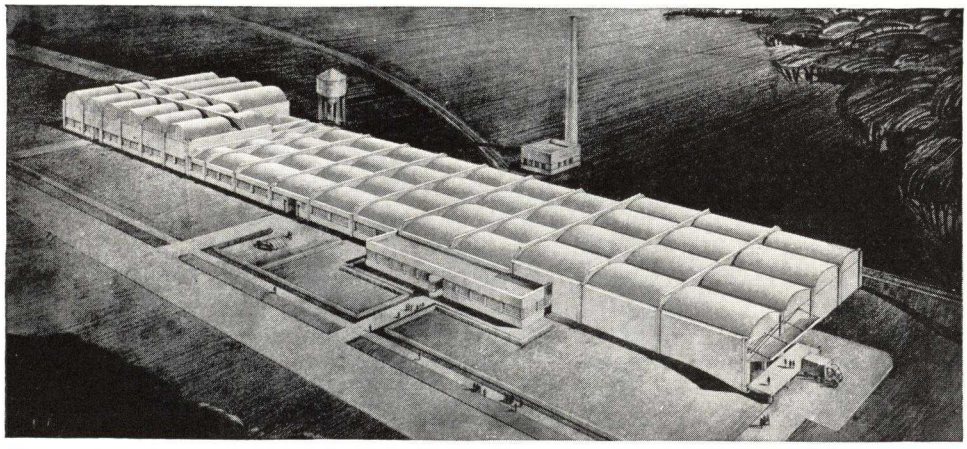
Sports arenas
Auditoriums
Factories and garages
Storage halls
Airplane hangars
Market halls
Gymnasiums and grandstands
Train sheds
Reservoir roofs
Dock structures
Monumental buildings

Z-D roofs have been subjected to many successful tests in this country.

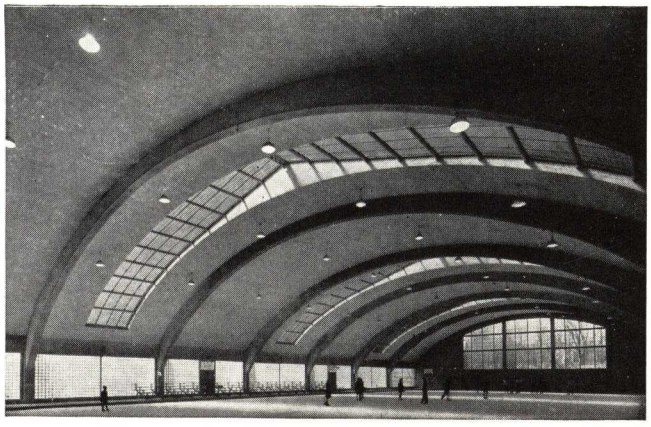
ROBERTS AND SCHAEFER COMPANY will furnish, without obligation, sketches showing the application of Z-D Roofs to different structures, and will co-operate with architects, engineers and contractors to develop plans for buildings suitable for Z-D construction, designed for specific requirements.

A Few Reasons for "Z-D" Structures

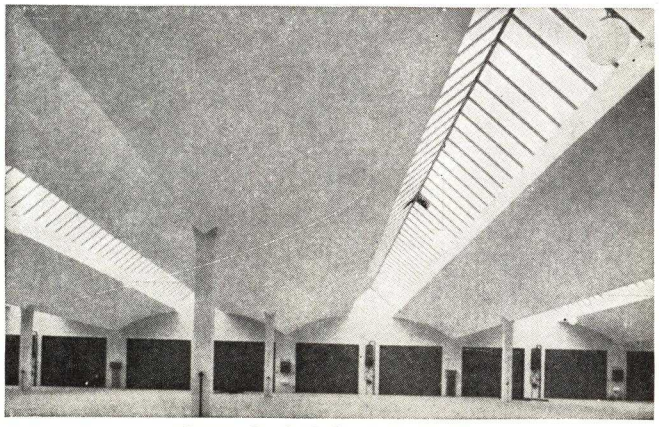
Permanence—no maintenance
Fireproof—low insurance rates
Strength with light weight
Attractive appearance
Absence of trusses and bracing
Earthquake-proof
Built by local labor
Low cost



This Natchez, Mississippi, Modern Fireproof Factory Was Built in 1938 for Approximately 6¢ per Cu. Ft. or Approximately $1 per Sq. Ft. Usable Floor Area



Skating Rink in Pennsylvania



Garage Roof of the Butterfly Type

H. H. ROBERTSON COMPANY

Robertson World-Wide Building Service

PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CANADA; ELLESMERE PORT, CHESHIRE, ENG.

DISTRICT OFFICES, AGENCIES AND BRANCH OFFICES

ALLENTOWN, PA., H. N. Crowder, 446 Union Street
BALTIMORE, MD., H. H. Robertson Company, 1635 Baltimore Trust Building
BIRMINGHAM, ALA., H. H. Robertson Company, 805-8 Protective Life Building
BOSTON, MASS., H. H. Robertson Company (344 Rock Island Rd., Quincy, Mass.)
BUFFALO, N. Y., H. H. Robertson Company, 602 Jackson Building
BUTTE, MONT., Archie W. Adams, 618 Metals Bank Building
CHARLESTON, W. VA., Fireproof Products Co., 422 Professional Building
CHARLOTTE, N. C., Edwin C. Boyette, Jr., 1025 Arosa Avenue (Box 27)
CHICAGO, ILL., H. H. Robertson Company, 360 No. Michigan Avenue
CINCINNATI, OHIO, H. H. Robertson Company, 1315 American Building
CLEVELAND, OHIO, H. H. Robertson Company, 1526 Hanna Building
DENVER, COLO., J. Q. Lalor, 1125 So. Vine Street
DETROIT, MICH., H. H. Robertson Company, 635 New Center Building
EAST ORANGE, N. J., H. H. Robertson Company, 25 No. Harrison Street
EASTON, PA., H. N. Crowder, 103 No. Fourth Street
EL PASO, TEX., Warren D. Small, 311 Mills Building
JACKSONVILLE, FLA., H. H. Robertson Company, P. O. Box 4523
KNOXVILLE, TENN., R. G. Jeffries, 409 W. Clinch Avenue (P. O. Box 2023)
LITTLE ROCK, ARK., Wherry & Co., 711 Rector Street (P.O. Box 282)
LOS ANGELES, CALIF., H. H. Robertson Company, 816 W. Fifth Street
MIAMI, FLA., Carl Adams, Hunting Lodge Dr. (Miami Springs)
MINNEAPOLIS, MINN., Hauenstein & Burmeister, 614 Third Avenue, So.
NASHVILLE, TENN., John McDougal, 2210 Elliston Pl.
NEW HAVEN, CONN., H. H. Robertson Company, 207 Orange Street
NEW ORLEANS, LA., H. H. Robertson Company, 736 Whitney Bank Building
NEW YORK, N. Y., H. H. Robertson Company, 475 Fifth Avenue
PHILADELPHIA, PA., H. H. Robertson Company, 1307 Real Estate Trust Building
PITTSBURGH, PA., H. H. Robertson Company, 2000 Grant Building
PORTLAND, ORE., Mercer Steel Company, 838 N. W. 13th Avenue
RICHMOND, VA., R. M. Nolting, 1103 E. Main Street (P. O. Box 1011)
ST. LOUIS, MO., H. H. Robertson Company, 1218 Olive Street
SALT LAKE CITY, UTAH, L. Brandenburger Co., 153 W. Second South Street
SAN FRANCISCO, CALIF., H. H. Robertson Company, 149 New Montgomery Street
SCRANTON, PA., F. H. Coffin, 210 Brooks Building
SEATTLE, WASH., Arthur A. Dally, 332 Pioneer Building
SYRACUSE, N. Y., F. J. Ludwick, 1126 Chimes Building
TULSA, OKLA., Murray R. Womble, 316 Atco Building
WASHINGTON, D. C., H. H. Robertson Company, 428 Woodward Building

FOR ENGLAND: H. H. ROBERTSON CO., MERSEY IRON WORKS, ELLESMERE PORT, CHESHIRE

FOR CANADA: H. H. ROBERTSON CO., LTD.
TORONTO (MAIN OFFICE), 611 Metropolitan Building — MONTREAL OFFICE, 526 Confederation Building

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Products

ROBERTSON CELLULAR STEEL FLOOR.

For Robertson Protected Metal (RPM), corrugated roofing, siding, building trim and steel decks; Robertson Ventilators, gravity and fan types; Robertson Louvers, Hoods and Ducts; Robertson Weatherproof Skylights and Sash (puttyless type); and Floor Wiring Method, see File Index.

RPM TRADE-MARK

Patents: Robertson Steel Floor is protected by United States Patents Nos. 1,855,082; 1,867,433; 1,986,121; 1,986,122; 1,994,113; 2,029,393; 2,041,965; 2,065,511; 2,065,546; and 100,082 Other United States and foreign patents pending

ROBERTSON CELLULAR STEEL FOR FLOORS, WALLS AND ROOFS

A complete unit building system of cellular structure, taking the form of hollow steel beams. Offers the architect the important advantages of *economy* and *speed* in construction together with an *electrical availability* hitherto unknown.

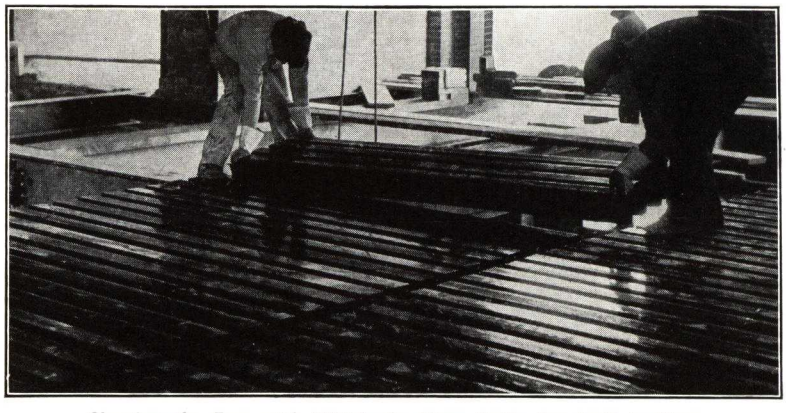
This product is the result of years of development work at the Mellon Institute of Industrial Research and the plant laboratories of the H. H. ROBERTSON COMPANY. Each unit is built by preforming two steel sheets and subsequently welding these two sheets together. The standard unit, as delivered to the construction job, is 24 ins. wide and consists of four cellular beams with a 24-ft. maximum span. The maximum weight per unit, except in special cases, is about 400 lbs. Generally, the average unit weighs less than 250 lbs. The design is such as to develop maximum efficiency of the metal.

Used for All Floors

All floor requirements of modern buildings are met by Robertson Cellular Steel.

Strength — Robertson Cellular Steel has exceptional strength, and provides for all combinations of floor loads up to 500 lbs. or more per square foot, and for all required span lengths up to 24 ft. Deflections under given load conditions can be predetermined. Load tables are available, based on tests made by the U. S. Bureau of Standards. *(Write for a reprint of the report which appeared in the August 1932 National Bureau of Standards Journal of Research.)*

Economy—This floor is more economical because it eliminates expensive electrical duct systems; speeds up construction 20 to 30 per cent (thus eliminating unproductive interest time on construction funds, saving labor cost and making possible earlier occupancy and more revenue); has a high salvage value; provides flexibility for alterations in case of occupancy changes; and reduces first cost, because light weight and strength of floor cuts down amount of forms and structural steel necessary for construction.



Showing the Ease with Which the Floor Units Are Laid in Place

They are then welded, bolted or clipped to the supporting framework. Any type of floor finish or ceiling may be applied. Each cell provides a potential raceway for installation of electrical wiring required by tenants for present or future use

Electrical Availability—Overcomes the inadequacies of present-day floor duct systems at a minimum cost by combining the features of both a floor and an electrical duct system. Each parallel cell (with a 6-in. spacing) is a potential conduit or raceway for electrical wiring; straight and free from interior obstructions and

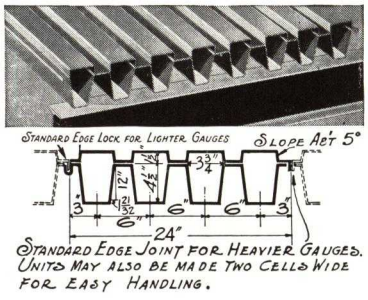
readily accessible, so that wires need not be drawn through until needed, but can be fished in at any time and place desired without necessitating the tearing up of floors or the disturbing of any arrangement not convenient for that purpose. Thus, this floor makes possible the installation of an electrical outlet wherever and whenever desired—and prevents the possibility of electrical obsolescence. Robertson Steel Floor and accompanying electrical distribution fittings are listed under the Re-inspection Service of the Underwriters' Laboratories, Inc.

Adaptability—Any type wearing surface desired may be applied to Robertson Cellular Steel Floors. The surface is level and does not vary more than ⅛ in. It is uniform in appearance on the underside and often requires no ceiling (attractive decorative schemes may be used on the underside of the floor). It is incombustible and, where permissible, requires no fireproofing. However, ceilings of any kind can be applied to it at no more cost than for other types of floors.

This floor is particularly adapted to service installations. If holes are cut through the floor the surrounding steel can be reinforced to restore original strength, if necessary.

Robertson Cellular Steel Floor and Electrical Fittings are approved by the Underwriters' Laboratories, Inc., Under Its Re-examination Service.

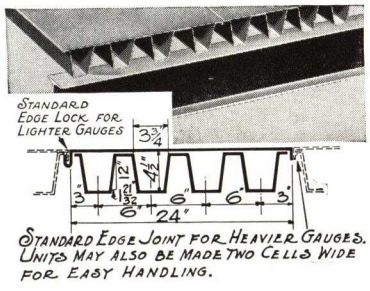
INDEX TO TYPES OF UNITS



K-Type Unit

Fundamental keystone-shaped unit for average loading on spans from 12 to 16 ft. Adaptable to all general floor construction and to installations requiring fireproofing or fill with lightweight concrete, etc. Any type of floor finish may be laid on the concrete surface.

Gauges 16-16, 14-14, 12-12, 10-10, 7-7, or combinations thereof.



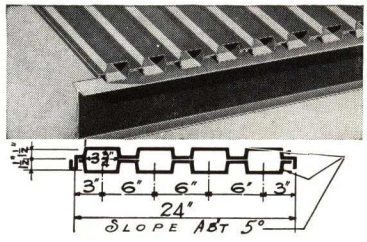
FK-Type Unit

Combination of flat plate with bottom element of the K-Type Unit. Used where loads are not in excess of 125 lbs. per sq. ft. and spans are 10 to 15 ft. Adaptable for installations not requiring fireproofing, and for floor finishes such as rubber tile, linoleum, mastics, wood parquetry, etc.

Gauges: 18-18, 16-16, 14-14, 12-12, 10-10, or combinations thereof.

In the inverted position it is used for floors of industrial, commercial and residential buildings, as it thus provides a flat steel ceiling that can be painted. This unit is called FKX-Type.

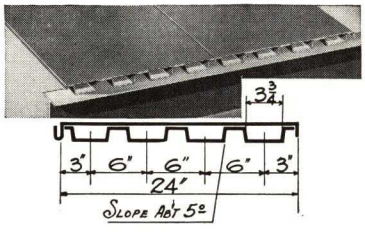
RK-Type Unit



The combination of two of the U-shaped upper plates of the fundamental keystone structure, making a rectangular cell which is well adapted to the fishing through of electrical wiring, etc. Also desirable for apartment houses, schools, stores, etc., where loads are not excessive, and it is desired to limit floor thickness as much as possible. For loads from 75 to 400 lbs. per square foot on spans from 6 to 12 ft. Adaptable to installations requiring concrete or similar materials for fill or fireproofing. Any type of floor finish may be applied on the concrete surface.

Gauges 16-16, 14-14, 12-12, or combinations thereof.

UK-Type Unit



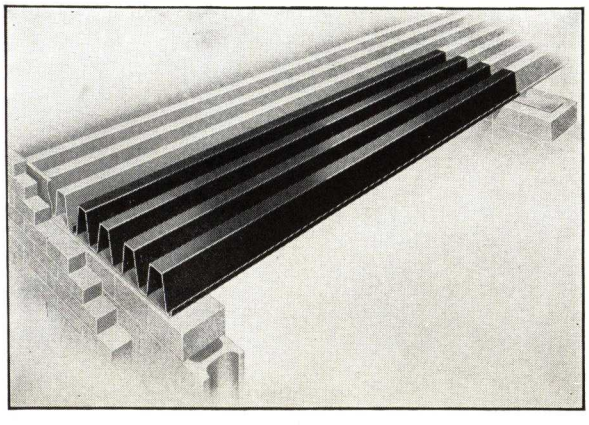
Combination of a flat plate with the U-shaped top plate of the fundamental keystone structure. Desirable where a flat floor finish is desired and the thickness of the floor surface must be limited. Is applicable for roof decks, floor for library bookstacks, balconies, etc. For loads of less than 200 lbs. per sq. ft. on spans of 4½ to 8 ft. Also used in inverted position, providing flat steel ceiling that can be painted. Adaptable to linoleum, rubber tile, mastics, etc., for floor finishes.

Gauges 18-18, 16-16, 14-14, 12-12, or combinations thereof.

When used in the inverted position it is called UKX-Type.

Note: Catalogue giving complete design data and load tables is available.

ROBERTSON STEEL FLOOR FOR RESIDENCES



For residences, an 18-18 gauge FK unit is inverted to provide a flat steel ceiling that can be painted or plastered. It provides a basement fire-stop, eliminates termite hazards, will not shrink or crack, is laid more quickly than other floors and provides 6-in. savings in excavation (when used as a first floor) and 6-in. savings in wall height for each additional floor. Troughs between cells are filled with lightweight concrete (to provide a level slab) and any wearing surface desired then may be applied. This floor furnishes a working platform for other trades as soon as laid, thus facilitating general construction. End closers (to close and level cell ends resting on exterior bearing wall), bearing plates (to level cell ends resting on interior bearing wall) and stairwell framing, all especially designed for Robertson Steel Floor, are available.

Write for booklet describing the use of this floor in residences.

MEMORANDA

SMOOTH CEILINGS SYSTEM

(U. S. Patents Nos. 1,950,422 and 2,000,543)
802 Metropolitan Life Building
MINNEAPOLIS, MINN.
REPRESENTATIVES IN PRINCIPAL CITIES

SOME ADVANTAGES OF "SMOOTH CEILINGS," ALL FLAT, BEAMLESS FLOOR-CONSTRUCTION FOR REINFORCED CONCRETE BUILDINGS and STRUCTURAL STEEL BUILDINGS

(1) The ceilings are flat in the construction itself.

(2) Floor slabs may be solid concrete or cellular, with light weight fillers or ceilings may be coffered. Plaster may be applied directly to the concrete ceiling, with or without bond coat, depending on conditions. Cost is thus reduced.

Office Building, Polish National Alliance
Chicago, Illinois
"Smooth Ceilings" System with Tile Fillers in Floor Slabs
J. K. Slupkowski, Architect
Carl A. Metz, Structural Engineer

(3) The ceilings may be finished and decorated on the solid concrete without plaster. Cost may thus be further reduced.

(4) This system will usually save several inches in the height of each story because less height is required by the floor construction. Several feet are saved in the height of the average building. Both construction and operating costs are thus reduced.

(5) Cost of forms for concrete is very low, and salvage on form lumber is exceptionally high, because a minimum amount of cutting and fitting is required.

(6) Cost of plastering, finishing, decorating and lighting the building is reduced because beams, girders, drop panels and flared column caps are omitted.

(7) Pipes and small ducts can pass through the slab around the columns without interfering with the construction. Pipes can run between flanges of steel columns. Furred columns can be smaller. See Fig. A.

(8) Cost of installing air conditioning is reduced by our all flat ceilings.

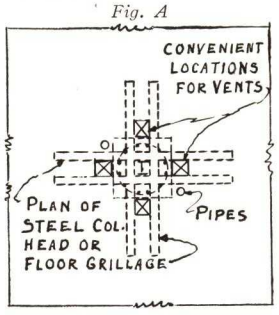
(9) Load tests on this construction show very small deflections, good recovery, low stresses in the concrete and steel.

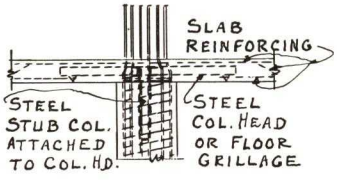
This system has been used and approved by the U. S. Government. It was used in constructing the U. S. Appraisers' Stores Building, Baltimore, Md.

This System Has Been Used in

Office buildings
Hospital buildings
School buildings
Garage buildings
Government buildings
Apartment buildings
Manufacturing buildings
Store buildings, warehouse buildings, etc.

Fig. A





Service

Prices will be quoted on the necessary steel column heads for any certain job. Estimates of quantities of concrete, reinforcing steel and structural steel will be made and furnished, based on architect's preliminary sketches or working drawings.

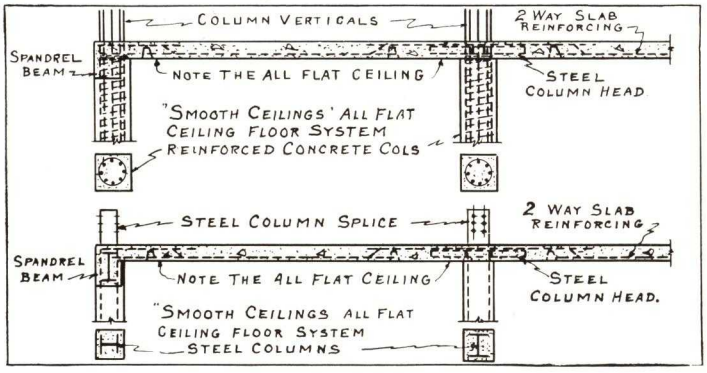


TABLE OF STANDARD SLAB THICKNESSES AND STEEL COLUMN HEAD DESIGNATIONS TO BE USED WITH STONE CONCRETE WEIGHING 150 LBS. PER CU. FT.

Span, ft.	Live load plus superimposed dead load 100 lbs. per sq. ft.		Live load plus superimposed dead load 125 lbs. per sq. ft.		Live load plus superimposed dead load 150 lbs. per sq. ft.		Live load plus superimposed dead load 200 lbs. per sq. ft.		Live load plus superimposed dead load 250 lbs. per sq. ft.		Live load plus superimposed dead load 300 lbs. per sq. ft.	
	Rough slab thickness, ins.	Column head desig.	Rough slab thickness, ins.	Column head desig.	Rough slab thickness, ins.	Column head desig.	Rough slab thickness, ins.	Column head desig.	Rough slab thickness, ins.	Column head desig.	Rough slab thickness, ins.	Column head desig.
For Concrete Having Strength 2000 Lbs. per Sq. In. at 28 Days												
14x14	5½	14-100	5¾	14-125	6	14-150	6½	14-200	7	14-250	7½	14-300
16x16	6	16-100	6¼	16-125	6½	16-150	7¼	16-200	8	16-250	8½	16-300
18x18	6¾	18-100	7	18-125	7½	18-150	8¼	18-200	9	18-250	9½	18-300
20x20	7½	20-100	7¾	20-125	8¼	20-150	9¼	20-200	10	20-250	10½	20-300
22x22	8¼	22-100	8¾	22-125	9¼	22-150	10¼	22-200	10¾	22-250	11½	22-300
24x24	9	24-100	9¾	24-125	10	24-150	11¼	24-200	12	24-250	12¾	24-300
26x26	10	26-100	10¾	26-125	11	26-150	12	26-200	13	26-250	13¾	26-300
28x28	10¾	28-100	11¾	28-125	12	28-150	13	28-200	14	28-250	14½	28-300
30x30	11¾	30-100	12¾	30-125	13	30-150	14	30-200	15	30-250	15¾	30-300
For Concrete Having Strength 2500 Lbs. per Sq. In. at 28 Days												
14x14	5¼	14a-100	5½	14a-125	5¾	14a-150	6	14a-200	6¼	14a-250	6½	14a-300
16x16	5¾	16a-100	5¾	16a-125	6¼	16a-150	6¾	16a-200	7	16a-250	7½	16a-300
18x18	6½	18a-100	6½	18a-125	7	18a-150	7½	18a-200	8	18a-250	8½	18a-300
20x20	7	20a-100	7¼	20a-125	7½	20a-150	8¼	20a-200	8¾	20a-250	9¼	20a-300
22x22	7¾	22a-100	8	22a-125	8¼	22a-150	9	22a-200	9½	22a-250	10¼	22a-300
24x24	8¼	24a-100	8¾	24a-125	9	24a-150	9¾	24a-200	10½	24a-250	11	24a-300
26x26	9	26a-100	9½	26a-125	9¾	26a-150	10¾	26a-200	11½	26a-250	12	26a-300
28x28	9½	28a-100	10	28a-125	10½	28a-150	11½	28a-200	12½	2 a-250	13	28a-300
30x30	10¼	30a-100	10¾	30a-125	11¼	30a-150	12½	30a-200	13½	30a-250	14¼	30a-300

WHEELING CORRUGATING COMPANY

Steel Floor and Roof System

WHEELING, W. VA.

ATLANTA, GA.
BUFFALO, N. Y.
CHICAGO, ILL.
COLUMBUS, OHIO
DETROIT, MICH.
KANSAS CITY, MO.
LOUISVILLE, KY.
MINNEAPOLIS, MINN.
NEW YORK, N. Y.
PHILADELPHIA, PA.
RICHMOND, VA.
ST. LOUIS, MO.

For Tri-Rib Steel Roof Decks, see File Index

WHEELING LONG-SPAN Steel Floor and Roof System is a lightweight, long-span system of steel floor and roof construction, which combines high strength with low cost.

THE UNIT

The basic unit of the WHEELING LONG-SPAN Steel Floor and Roof System is a channel-shaped joist whose top flange is considerably wider than the bottom flange. These joists are available in depths of 5, 6, and 8 ins. and 12 or 14-gauge steel.

A shelf, about 1½ in. in width and equal in depth to the thickness of the metal, is provided at the top of all joists directly over the web, for the purpose of providing a shelf for the reception of the edge of the top flange of adjacent joists.

As each joist is laid, the edge of the top flange is supported by the above mentioned shelf of the adjacent joist, and welded to it with welds ½ in. long, and spaced at 6-in. intervals for the entire length. The result is a series of correctly spaced joists, completely welded together to form an integral unit. A smooth, level floor or roof surface of solid steel is provided, ready to receive any desired type of floor or roof finish.

ECONOMY

The use of WHEELING LONG-SPAN Steel Floor and Roof System shortens the time required to complete a particular project due to the fact that a safe floor is provided for other trades immediately after the floor or roof has been installed. Ordinary delays, such as those caused by the use of temporary planking or waiting for concrete to set, are entirely eliminated. Manufactured in lengths capable of spanning the distance from girder to girder or from truss to truss, the use of intermediate beams and purlins is entirely eliminated, reducing the cost of the structural steel framework considerably.

The cost of WHEELING LONG-SPAN Steel Floor and Roof System will be found to be lower than other types of fireproof floor and roof construction.

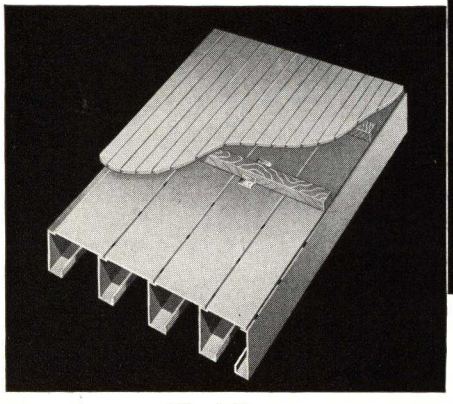
ADAPTABILITY

Any type of finished floor may be applied to the WHEELING LONG-SPAN Steel Floor and Roof System. Metal lath may be applied directly to the underside of the joists for ceiling construction by means of lath clips furnished for this purpose by the WHEELING CORRUGATING COMPANY.

SAFEGUARDED AGAINST CORROSION

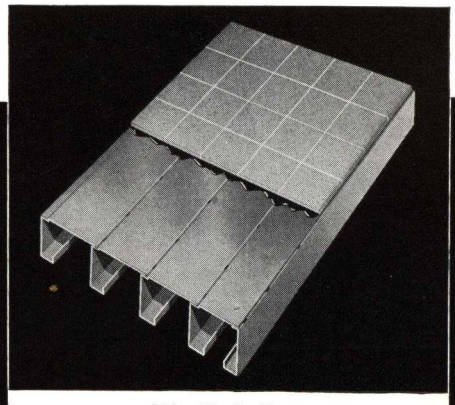
After fabrication, each unit receives a dip coat of high-quality protective asphalt paint as a protection against corrosion.

The following page illustrates a few typical installations of the WHEELING LONG-SPAN *Steel Floor and Roof System, and contains all the technical data necessary to properly design a floor or roof.*



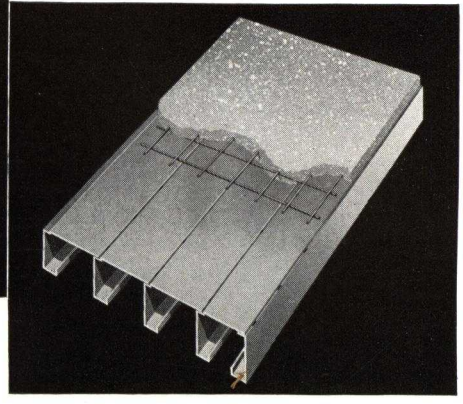
Wood Floor

Screed clips are welded or attached to steel floor plate with self-tapping screws. The wood screed is then nailed to projecting (O.S. flange) flange of the clip, and flooring is then nailed to the wood screed



Tile Block Floor

A composition filler is first applied to the steel floor plate in accordance with tile manufacturers' specifications. After filler is screeded to produce a smooth level surface the floor tile is laid



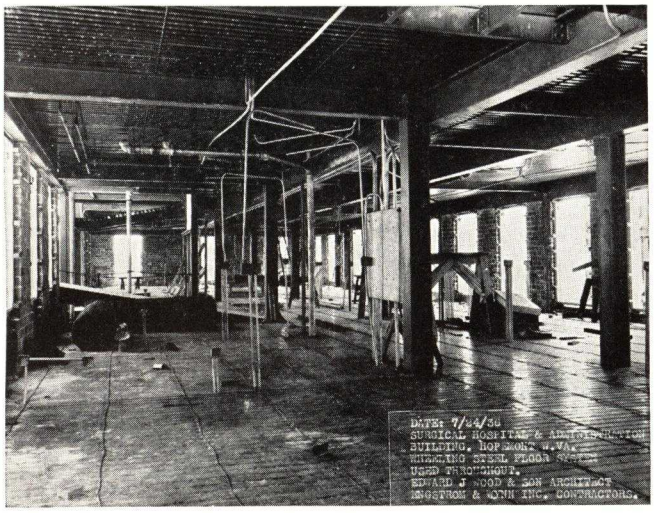
Concrete and Terrazzo Finish

The concrete is poured on the steel floor plate and screeded to a smooth level surface. Floor hardener or composition is then applied in accordance with the manufacturer's specification

WHEELING LONG-SPAN System is used as a working platform and material storage space for the masons' storage of brick, stone, windows, etc. Work of all trades proceeds uninterrupted.

This working platform can be made ready almost as fast as the steel frame of the building is erected.

Joists are hoisted to the proper floor and distributed to their various locations. Joists are first welded to the main supporting members, then welded together at the seams, thus permitting the operator to work from the top at all times. The speed with which this operation is done permits the other trades to move in and start work immediately, speeding up the whole job.

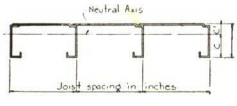


Plumbers, steamfitters, electricians, and others can set up their benches and proceed with roughing-in work immediately after the joists are welded in place.

Complicated detailed erection drawings are not necessary. All parts are factory-made, resulting in a finished job which does not depend entirely on the skill of the individual workman.

SAFE UNIFORM LOADS PER SQUARE FOOT INCLUDING DEAD LOAD OF DECK

D	Gauge	Joist spacing, In.	M	CS	SPAN IN FEET													Wt. Per Sq. Ft.		
					10	11	12	13	14	15	16	17	18	19	20	21	22	Lbs.	C	C′
5″	14	6	46000	30700		252	191	152	122	98								8.10	2.73″	2.27″
		8	34500	23000		189	143	104	91	73								6.84		
		10	27600	18400		151	115	91	73	58								6.10		
		12	23000	15300		126	96	76	61	49								5.61		
		14	19700	13100		95	82	65	52	42								5.35		
5″	12	6	63000	42000		346	266	208	168	136								11.28	2.74″	2.26″
		8	47200	31500		259	200	156	125	101								9.54		
		10	37800	25200		206	160	124	100	81								8.51		
		12	31500	21000		173	133	104	84	68								7.81		
		14	27000	18000		148	114	89	72	58								7.47		
6″	14	6	59400	39500				232	186	152	124	104	82					8.60	3.22″	2.78″
		8	44600	29700				174	139	113	93	78	61					7.21		
		10	35700	23700				139	111	91	74	62	49					6.43		
		12	29700	19700				116	93	76	62	52	41					5.86		
		14	25500	17000				95	79	65	53	44						5.59		
6″	12	6	82400	54900					258	208	172	144	114					12	3.22″	2.78″
		8	62000	41400					193	155	129	108	85					10.1		
		10	49500	33000					155	124	103	86	68					8.95		
		12	41200	27500					129	104	86	72	57					8.18		
		14	35400	23600					110	89	73	61	48					7.80		
8″	14	6	90000	60000							234	208	176	158	136	118	102	9.62	4.55″	3.45″
		8	67600	45100							176	156	132	118	102	88	76	8.03		
		10	54000	36000							140	124	105	94	81	70	61	7.04		
		12	45000	30000							117	103	88	79	68	59	51	6.39		
		14	38600	25700							95	89	75	67	58	50	43	6.05		
8″	12	6	124600	83000							324	287	244	220	188	162	140	13.44	4.55″	3.45″
		8	93500	62300							243	215	183	165	141	121	105	11.17		
		10	74600	49700							194	172	146	132	112	97	84	9.81		
		12	62300	41500							162	143	122	110	94	81	70	8.90		
		14	53400	35600							139	123	104	94	80	69	60	8.43		



M=Resisting moment per foot width of floor (fs=16000#□″)

CS=Coefficient of strength per foot width of floor.

Loads underscored in with heavy line thus 176 are determined by maximum bending stress.

Loads enclosed in heavy lines thus |95| are governed by strength of top plate in bending. All other loads are calculated to produce a maximum deflection of $\frac{1}{360}$ of the span length.

Where deflection is not a governing factor, safe load per square foot may be obtained by dividing CS by (span in ft.)²

ARCH ROOF CONSTRUCTION CO., INC.

TELEPHONE
CHickering 4-3516

Engineers and Contractors
55 West 42nd Street, NEW YORK, N. Y.

DISTRICT REPRESENTATIVES
CHICAGO, ILL., R. H. Finley, 332 So. LaSalle Street—Telephone, Harrison 5628
CLEVELAND, OHIO, The Carver-Behan Co., 1740 E. 12th Street
LOS ANGELES, CAL., Bert E. Anderson, 9129 W. Adams Street
SAN FRANCISCO, CAL., Rolph, Mills & Co., Rialto Building

LONG SPAN ROOF ARCHES

Scope of Application and Service

Design, construction and erection of Long Span Roof Arches for theaters; auditoriums; convention, exhibition and fair buildings; garages; warehouses; factories; airplane and dirigible hangars; gymnasiums; skating rinks; bowling alleys, and all buildings where unobstructed space, maximum light and ventilation are desired.

Arch Roof Construction Co., Inc., will design arches, supply all materials and do the erection, or ordinary materials can be supplied and erection done by local contractors. Co-operation is offered to architects, engineers and contractors in planning the most economical and efficient design for particular buildings.

A request will bring additional information.

Field Buildings

Our field or sports' buildings can be erected so they may also be used for auditoriums, theatres, gymnasiums, ice hockey, etc. Buildings are easily interchangeable (without structural changes) permitting daily varied activities in one efficient structure, eliminating the need for several infrequently used buildings.

Indoor Tennis and Badminton Buildings

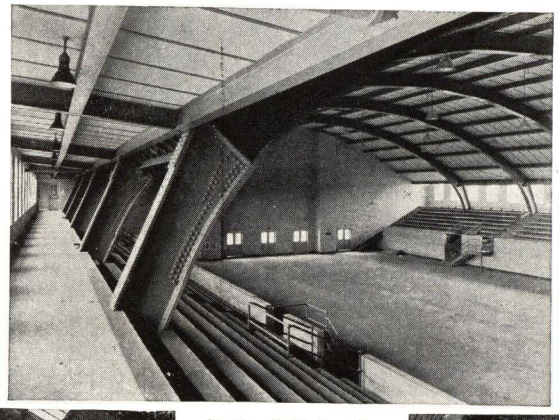
Indoor tennis, or badminton buildings, containing one or many courts, with perfect natural daylighting and artificial light, without glare; playing in direction of the arches to conserve building height and produce perfect buildings at a minimum of cost.

Spans to Over 400 Feet

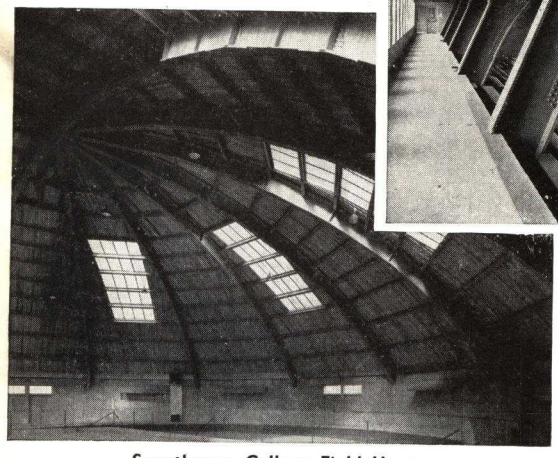
We use short lengths of the usual structural materials in the patented design and construction of buildings having spans up to *400 feet* or more, where unobstructed space (no columns, posts or trusses) is desired. Heights are adjusted to suit. Construction may be fireproof, fire-retardant or non-fireproof. Seats can be built parallel to arches from floor to high points of arches.

Design

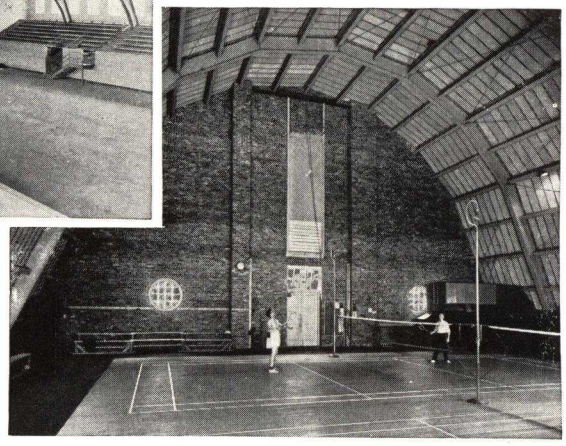
All our arches are scientifically designed as hingeless, one, two, or three-hinged arches, and any competent structural engineer can design and check our arches. In our design, ample provision is always made for all dead, live and unbalanced loads, rib shortening, temperature variation, etc.



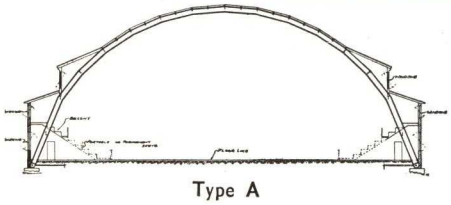
Bucknell University Gymnasium
Jens Frederick Larson, Architect



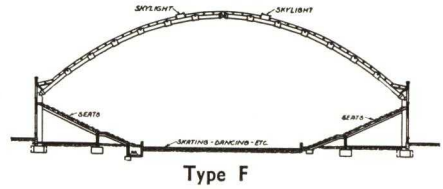
Swarthmore College Field House
Walter T. Karcher and Livingston Smith, Architects



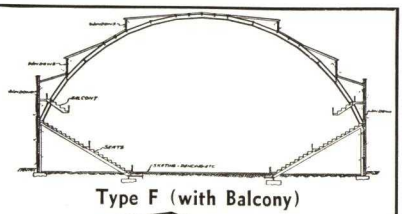
Badminton Courts Building, New Haven Lawn Club Association
Douglas Orr, Architect



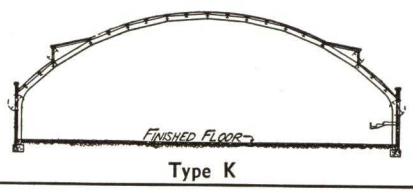
Type G



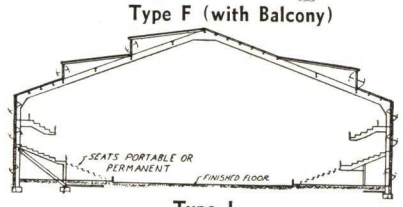
Type F



Type F (with Balcony)



Type K



Type J

United States Patents
1,480,882 January 15, 1924
1,639,930 August 23, 1927
1,783,958 December 9, 1930
1,795,331 March 10, 1931
1,891,346 December 20, 1932
2,021,480 November 19, 1935
2,031,937 February 25, 1936

TYPES OF ARCH ROOF CONSTRUCTION
for Every Requirement
Other patents pending

Canadian Patents
329,165 January 10, 1933
331,206 March 28, 1933

Great Britain Patents
382,138 January 18, 1932

McKEOWN BROS. COMPANY

ESTABLISHED 1894

Oldest Manufacturers of Laminated Arches and Roof Trusses in America

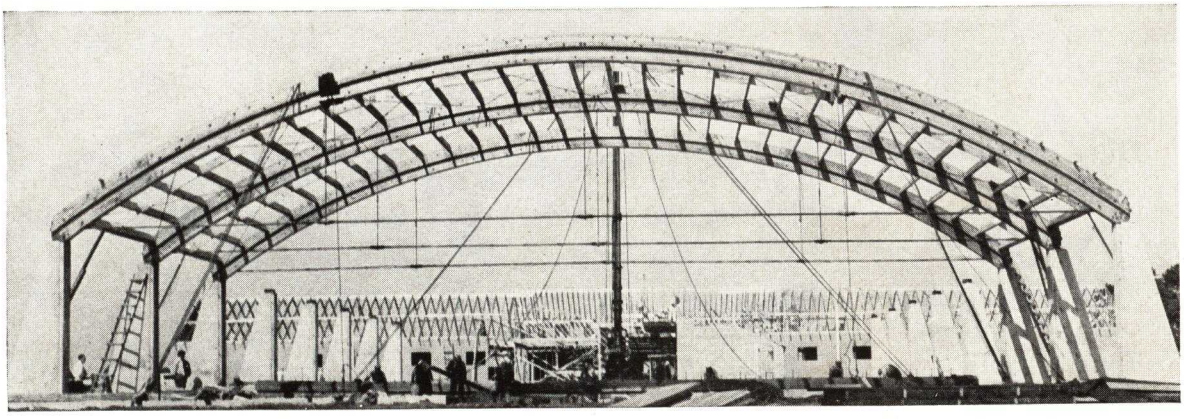
TELEPHONE
Lafayette 8161

5235 South Keeler Avenue, CHICAGO, ILL.

AFFILIATE: WOOD ROOF TRUSSES, INC., NEW YORK, N. Y.
Licensed by Timber Engineering for Timber Connectors

LAMINATED ARCHES AND WOOD ROOF TRUSSES

Twenty years' experience in glued Laminated Sections for structural purposes. Factory built or built on job.



RALPH MILMAN—A. S. MORPHETT, Chicago, Ill., Architects

Glued Laminated Wood Arches—82-Ft. Span

JOSEPH T. CARP, INC., Chicago, Ill., Contractor

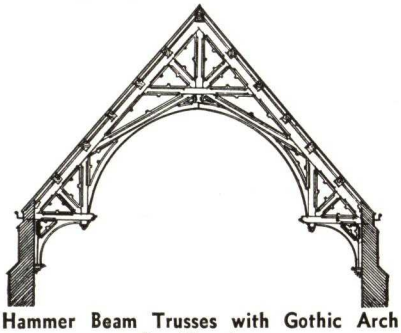
Roof Trusses and Laminated Arches to solve any inward or outward appearance of a building. Arches extending to foundations or below ground or bearing on masonry walls with or without tie rods.

Outstanding Features

Glued lamination makes permanent solid construction in any desired shape with or without web members.

Timber Truss Ornamentation

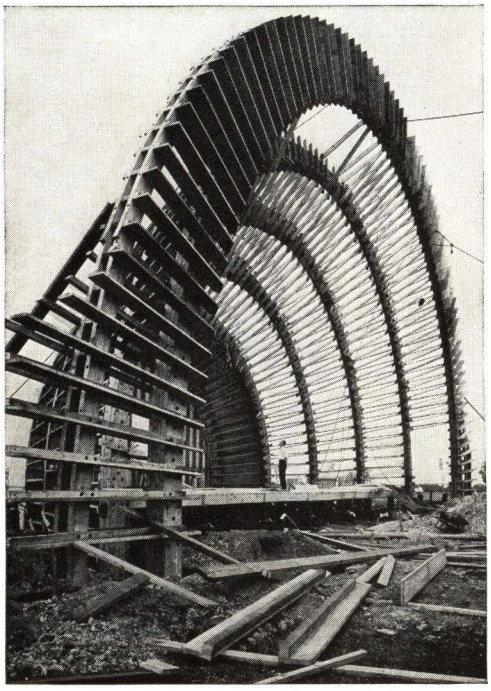
Finest timbers—hand adzed—rough sawn or charred with wrought iron work of any design.



Hammer Beam Trusses with Gothic Arch for Churches

Howe Trusses with Straight or Curved Lower Chords for Pitched Roofs

ANY SHAPE OR SIZE



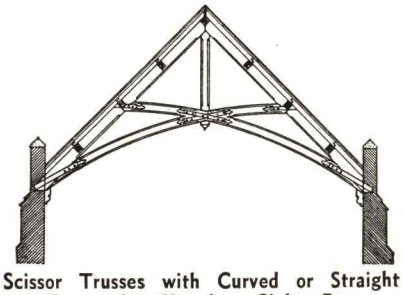
Band Shell—110-Ft. Laminated Arches
Built 1931 in Grant Park, Chicago, Ill.

Mouldings and Tracery

Can be worked to pattern on solid timbers or applied.

Information Needed for Estimates

Send tentative plan if special timber trusses or arches are required. For Bowstring or Crescent Trusses send type of building, number of trusses, overall length, spacing on centers, load to be carried and location of job.



Scissor Trusses with Curved or Straight Braces for Churches, Clubs, Etc.

Bowstring Trusses with Open or Lattice Type Webbing

LAMELLA ROOF SYNDICATE, INC.

45 West 45th Street, NEW YORK, N. Y.

(Holding Company for Lamella Patents in United States, Canada and Mexico)

AUTHORIZED LAMELLA LICENSEES

NEW YORK, N. Y., 45 W. 45th St.
Lamella Constructions, Inc.

ROCHESTER, MINN., 112 N. E. 7th St.
The Kruse Co.

ST. LOUIS-GLENDALE, MO., 785 Bismarck Ave.
Lamella Roof Co.

SAGINAW, MICH., 726 No. Niagara St.
L. W. Wells Construction Co.

OMAHA, NEB., 1324 Pierce St.
Lamella Roof Co.

TOPEKA, KAN., 1510 W. 17th St.
Ira D. S. Kelly

DALLAS, TEX., 630 Wilson Bldg.
J. L. O'Hearn

SAN ANGELO, TEX.
West Texas Lumber Co.

HOUSTON, TEX., 1615 Waugh Drive
Allen Construction Co.

McALLEN, TEX., 518 No. Main St.
E. A. Noser

TWIN FALLS, IDAHO, P. O. Box 1153
Lamella Roof Co.

PHOENIX, ARIZ., 806 W. Madison St.
Summerbell Roof Structures of Arizona

SALT LAKE CITY, UTAH, 333 W. First South St.
Utah Lumber Co.

LOS ANGELES, CALIF., 754 E. 29th St.
Summerbell Roof Structures

OAKLAND, CALIF., 354 Hobart St.
Summerbell Roof Structures of No. Calif.

PORTLAND, ORE., 417 Davis Bldg.
Summerbell Roof Structures of Oregon

SEATTLE, WASH., 2411 Eighth Ave., W.
Summerbell Roof Structures of Washington

MONTREAL, QUE., 1226 University St.
Lamella Trussless Roof Co., Ltd.

LAMELLA

Reg. U. S. Pat. Off.

LAMELLA TRUSSLESS ROOFS

Trussless Roofs

Lamella Trussless Roofs are arch structures of wood or steel consisting of a series of short sections arranged in a diamond pattern to form a continuous arch. They are designed according to accepted engineering practice in conformance with local climatic conditions and specific requirements of local building codes.

Hundreds of Lamella Trussless Roofs, comprising millions of square feet of roof area, have been designed and erected in the United States in spans up to 165 ft.

Fire Resisting Qualities

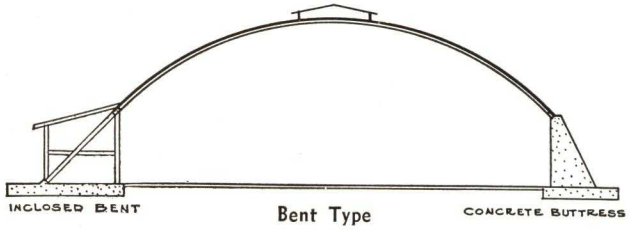
Fire resisting qualities are rated in all localities at least equal to unprotected steel with open rafters.

A Typical Lamella Roof (Bent Type)

The tie rods are used if the walls are not braced by Bents

Acoustical Qualities

Lamella Trussless Roofs have proven their acoustical qualities by their repeated installation in auditoriums, churches and community center buildings. The diamond network reflects sound without causing reverberations.



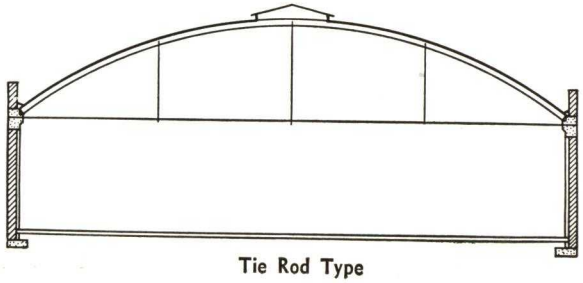
Bent Type

Lamella Trussless roofs may be curved down at the ends, thereby forming a cloistered roof of four or more sides. Lamella roofs have been built in many types and shapes and can be designed to suit almost any building.

Service

The licensees maintain trained engineering staffs to assist the architect in the detailed design of the roof and its connections to other parts of the building.

Detailed drawings, together with the necessary stress analysis, are promptly furnished.



Tie Rod Type

ROOF STRUCTURES, INC.

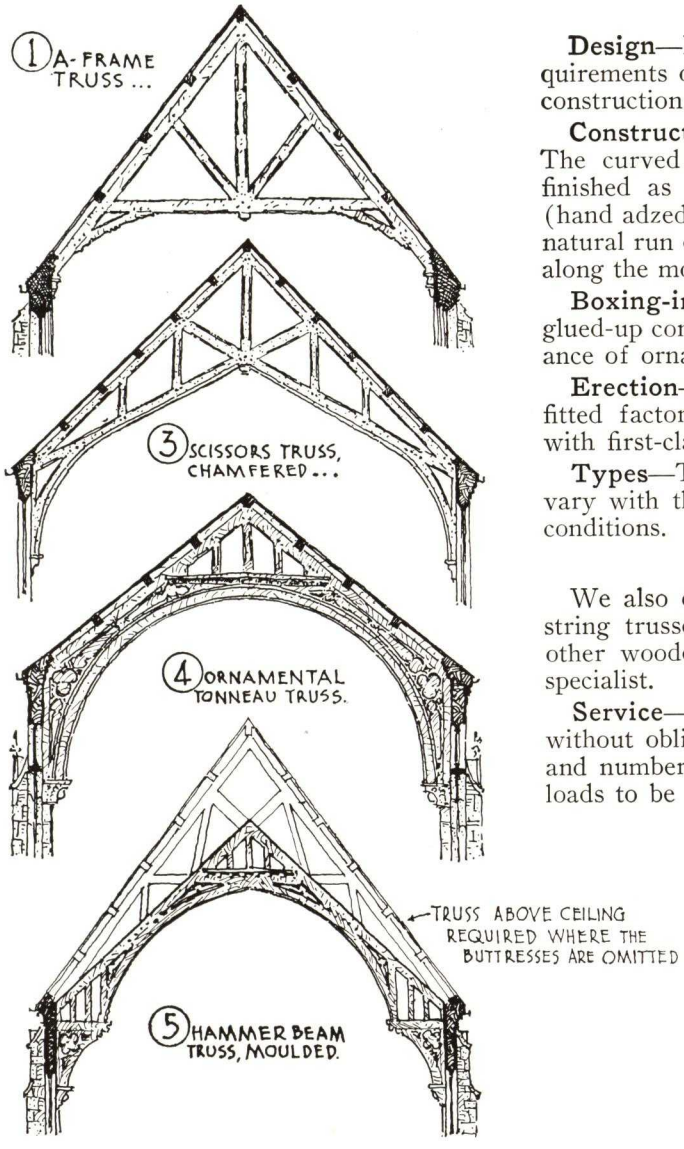
Specialists in Ornamental and Commercial Wooden Structures

TELEPHONE
BRyant 9-8532

45 West 45th Street, NEW YORK, N. Y.

Affiliate: Roof Structures, Inc., St. Louis-Glendale, Mo.

LICENSED BY TIMBER ENGINEERING CO. FOR MODERN TIMBER CONNECTORS



Custom Built Wood Trusses

Design—Designed by registered engineers familiar with the requirements of building departments and experienced with glued-up construction and modern timber connectors.

Construction—Constructed with structural grades of lumber. The curved chords are glued-up and bolted in laminations and finished as one piece. Surfaces are smooth (sanded) or rustic (hand adzed). Mouldings on the continuous laminations follow the natural run of the grain and the unsightly opening of joints or tears along the mouldings are prevented.

Boxing-in of Steel Trusses—This is accomplished by the same glued-up construction, with moulded laminations, giving the appearance of ornamental wood trusses.

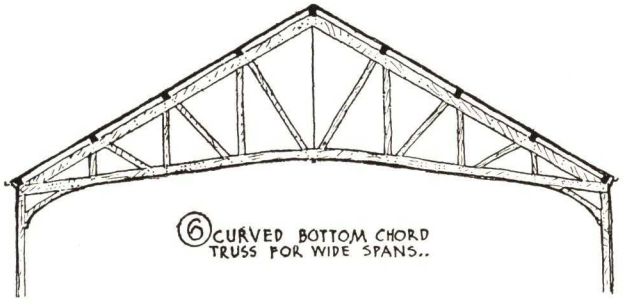
Erection—Is handled by experienced crews assembling the prefitted factory-built sections or members, and finishing each truss with first-class workmanship.

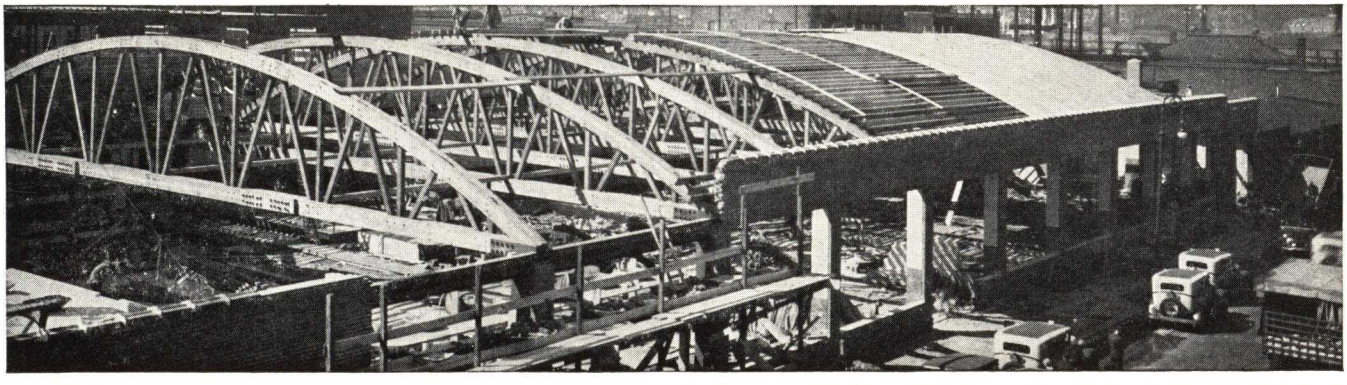
Types—Truss Types are not restricted to those shown but may vary with the individual designs of the architect and special load conditions.

Scope of Activities and Service

We also construct and design—in addition to commercial Bowstring trusses—arch centerings, radio towers, timber bridges and other wooden structures requiring the skill and knowledge of a specialist.

Service—Tentative designs and estimates of cost are furnished without obligation. To facilitate this, state (a) type, pitch, finish and number of trusses; (b) span and spacing; (c) live and dead loads to be carried; (d) location of building.





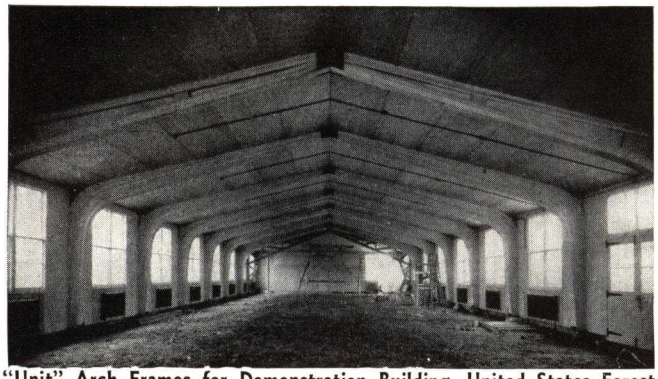
Type ⑦ Commercial Truss Installation, Garage, International Mack Truck Company, 625 West 42nd Street, New York, N. Y.—100 Foot Span

ELWYN E. SEELYE, Engineers; TURNER CONSTRUCTION CO., General Contractors

MEMORANDA

"UNIT" STRUCTURES, INC.

Manufacturers of Modern Wood Roof Structures
PESHTIGO, WISCONSIN



"Unit" Arch Frames for Demonstration Building, United States Forest Products Laboratories, Madison, Wis.

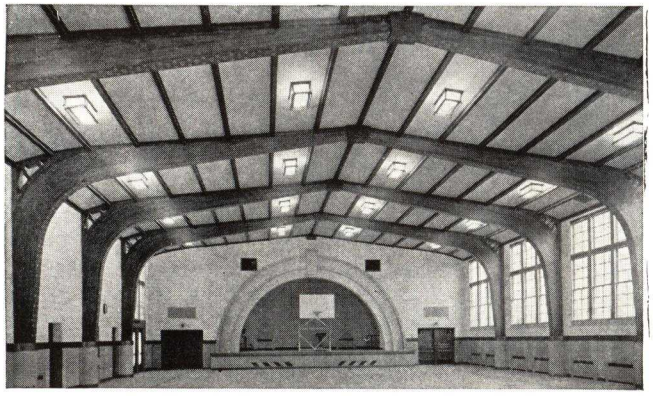
UNIT GLUED LAMINATED ROOF ARCHES

(Patents Pending)

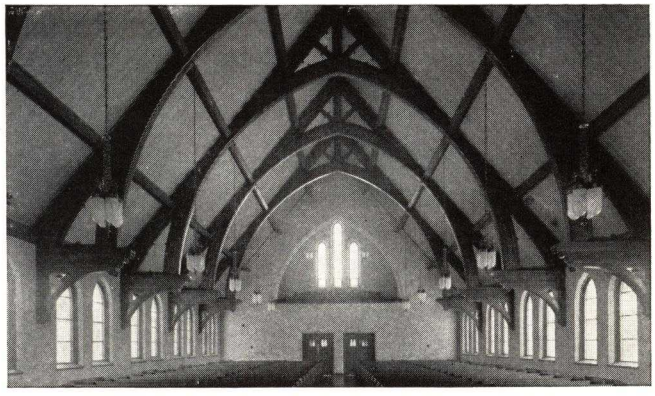
For Any Building In Any Span

Unit Arches are glued laminated wood roof structures, prefabricated of thin laminæ united under high uniform pressure. The laminæ are forcibly curved into solid timbers of required shape.

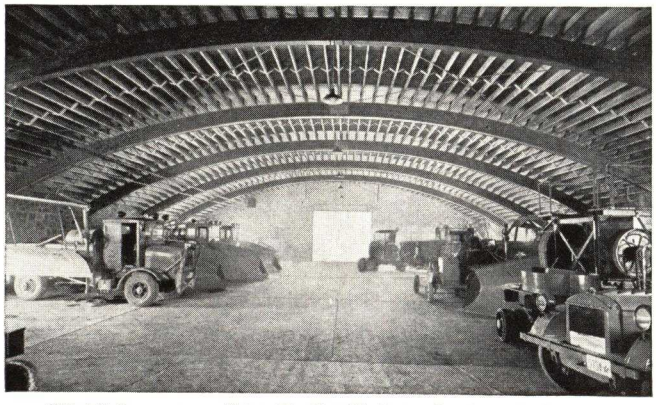
They are made in any shape to fit all types of buildings and possess unusual beauty because open joints and checks are eliminated with smooth surfaces stained and varnished. Pleasing appearance and variety of shapes make them desirable for auditoriums, churches, gymnasiums and all types of sports buildings. Since the form of the arch follows the function of the building many economies are made possible through saving in space and materials. Complete design data and fully illustrated catalogs will be promptly mailed upon request.



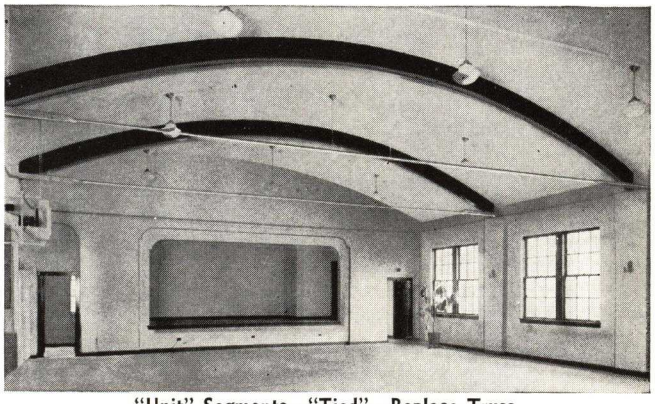
"Unit" Arch Frame Installation for Gymnasium



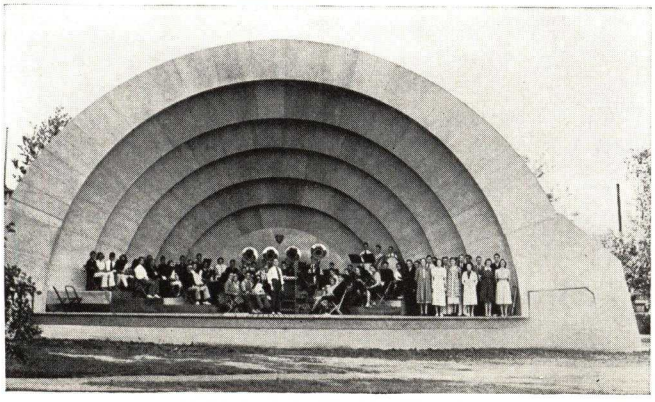
"Unit" Arch for Church—in Any Architectural Style



"Unit" Segments—"Not Tied"—Highway Equipment Garage



"Unit" Segments—"Tied"—Replace Truss



"Unit" Arch Frames for Band Shell

"Unit" Arch Frame Installation for Dance Hall

DETROIT STEEL PRODUCTS COMPANY

Manufacturers of Holorib Insulated Steel Roofs, Reinforcing Forms and Sanacoustic Holorib Roof Units

2250 East Grand Boulevard, DETROIT, MICH.

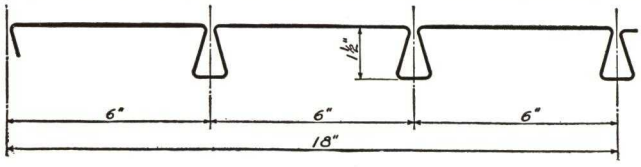
FACTORIES
DETROIT, MICH. OAKLAND, CALIF.

For Fenestra Windows and Doors, see File Index

Fenestra HOLORIB

THE HOLORIB STEEL DECK

Holorib, the oldest steel deck of its type, is a structural sheet steel unit applied directly over purlins or rafters to form the roof sheathing or roof slab. It is so formed as to be rigidly self-reinforced by triangular ribs 1½" deep spaced 6" on center. Sheets have a covering width of 18" and are furnished in proper lengths to make end laps over supports. Holorib is fabricated from copper-bearing steel sheets, 18- or 20-gauge on regular order, 22-gauge on special order.



FINISH

Holorib sheets are finished (standard) with one dip-coat of gray priming paint, thoroughly oven-dried. One additional coat of an enamel type paint should be applied to the under side by the painting contractor after erection, to cover scratches and abrasions caused during transit and construction.

(Where processes within the building are of a nature to cause or require high temperature or humidity, special painting may be advisable as an additional safety factor.)

Holorib will be supplied "Bonderized" (as a protection against rust and to provide better "footing" for field paint), at extra cost, if specified.

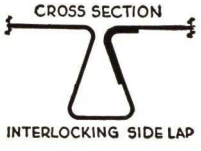
END LAPS AND SIDE LAPS

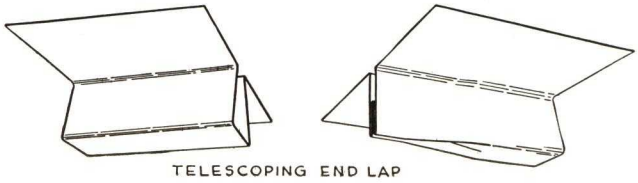
One end of each sheet is "crimped" so that it "telescopes" into the end of the adjoining sheet. This method of joining leaves all ribs complete with practically full strength, and affords a real protection against dripping asphalt.

The standard length of this telescoping end lap is 2½". All end laps are made directly over purlins.

One lateral edge of each Holorib sheet is turned downward to form a "barge strip" 1" deep. When erected, this barge strip nests or interlocks into the triangular rib of the adjacent sheet, forming an interlocking side lap which is tight, smooth and permanent, but which allows the deck to conform to the movements of the material above it.

Note that the outside rib of each sheet is complete, affording the same strength at all points of the deck. No side lap clips are necessary.





TELESCOPING END LAP

LAYING AND ATTACHING

The erection of Holorib is simple and may be done by the General Contractor with the aid of the complete installation instructions and thoroughly engineered roof diagram furnished for every operation. If desired, Detroit Steel Products Company will furnish superintendence to aid the contractor, or the Fenestra Construction Company, a subsidiary of Detroit Steel Products Company, will undertake erection under separate contract and assume full responsibility.

Where facilities permit, the Holorib sheets may be welded directly to the purlins. This method of attachment is well standardized on large operations and is increasingly popular on small operations.

Where attachment of Holorib by means of welding is not feasible, the standard method is by means of Holorib Steel Clips. These clips are standardized and carried in stock to fit most of the commonly used structural steel members. They have been designed to make erection easy and "foolproof," and to anchor the deck firmly in place with an ample factor of safety in holding power.

SPAN RECOMMENDATIONS

Maximum recommended span	Gauge	Weight of deck per net square
5′ 6″	No. 22	200 lbs.
7′ 6″	No. 20	240 lbs.
8′ 6″	No. 18	320 lbs.

● ●

HOLORIB CATALOGS

The following catalogs, containing complete Holorib data, specifications and details, will be sent promptly, at no obligation, in response to your request:

HOL-1 THE HOLORIB GENERAL CATALOG
HOL-1A ROOF DETAIL SUPPLEMENT
HOL-1B REINFORCEMENT FORM DETAIL SUPPLEMENT AND LOADING TABLES

HOLORIB ENGINEERING SERVICE

Holorib Division, Detroit Steel Products Company, maintains a full staff of engineers thoroughly trained and experienced in the solving of roof problems. You are solicited to make use of their services at any time—at no cost or obligation.

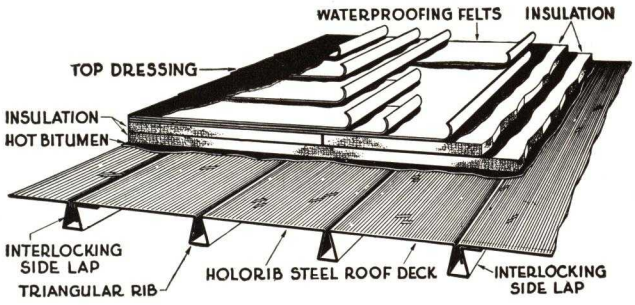
THE HOLORIB INSULATED STEEL ROOF UNIT

The Holorib Insulated Steel Roof Unit has as a base the famous Holorib Steel Deck with its triangular rib construction, which provides rigidity with minimum weight, and thus reduces structural requirements and makes possible considerable savings in initial cost.

The middle stratum of the unit is composed of pressure-resisting insulation, applied in proper thickness to minimize winter heat loss, provide protection from high summer temperatures and prevent condensation under the most severe conditions.

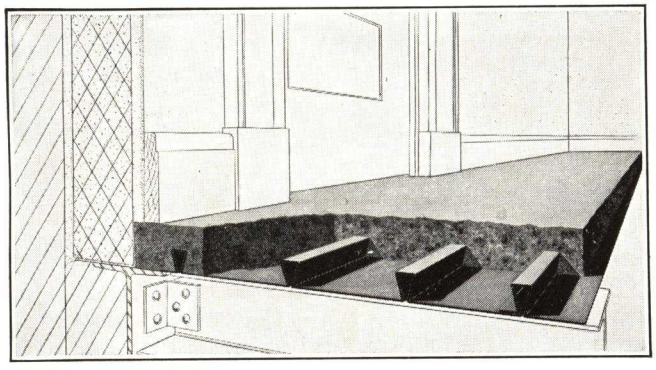
The outer surface is a long-lived waterproofing designed for permanent protection against the elements.

These component parts—steel deck, insulation and waterproofing—have a natural affinity, each for the others. They are bonded together and waterproofed by moppings of roofing asphalt. Thus united, they form a complete roof, permanent, proof against weather, fire or rot.



Although Detroit Steel Products Company produces only the Holorib Steel Deck portion of this unit, its engineers, backed by many years of experience in the roofing industry, are equipped and qualified to design complete roof structures to meet all requirements.

HOLORIB REINFORCING FORMS



Holorib Steel Deck with its ribs turned up is an effective, permanent, combination form and reinforcement for concrete slabs. It has been used with unqualified success for concrete floors, balcony steps, arena seats, stair wells, pipe ducts and trenches.

The triangular ribs "key" into the concrete and form a definite reinforcing bond. Within most load limits no additional reinforcing is necessary; the cost of such material and the labor for setting it is altogether saved. The tight joints of the forms prevent wet concrete from dripping over structural steel and onto lower floors, thus insuring appreciable economies in cleaning-up costs.

Holorib Forms have many other advantages: They can be erected for the entire structure as soon as steel framework is in place, and as a result, concrete pouring can be carried forward uninterrupted by the time-wasting procedure of removing, cleaning and resetting, necessary when ordinary wood forms are used. They provide an immediate platform and safety staging for workmen placing conduits, pipe lines, etc. Their attractive underside appearance is important where ceilings are not to be plastered.

THE SANACOUSTIC HOLORIB ROOF UNIT

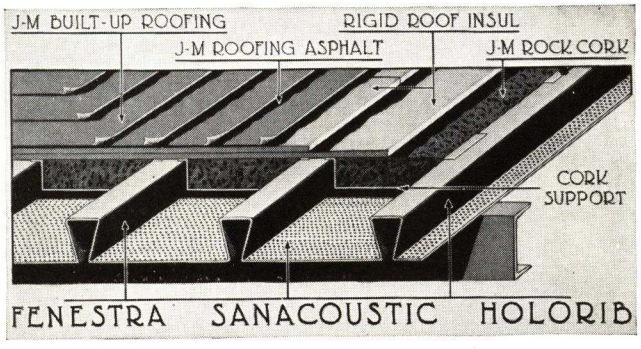
Sanacoustic Holorib, developed with the co-operation of Johns-Manville engineers, is a combination, in one unit, of a lightweight steel roof deck, with a sound absorbing facing which constitutes the ceiling of the interior, an efficient heat insulation and a waterproofing surface exposed to the weather.

It is applicable to theaters, auditoriums, gymnasiums, churches or factory offices, in fact, to nearly all buildings where suspended ceilings can be omitted.

The outstanding feature of Sanacoustic Holorib is the fact that it can be guaranteed to have 70% sound absorption at a frequency of 512 cycles.

It has a heat transmission of only .15 B.t.u.'s per hour, per square foot per degree difference in temperature.

It provides this high degree of sound quieting and heat stop value at a cost far below that of other similar materials of equal efficiency.



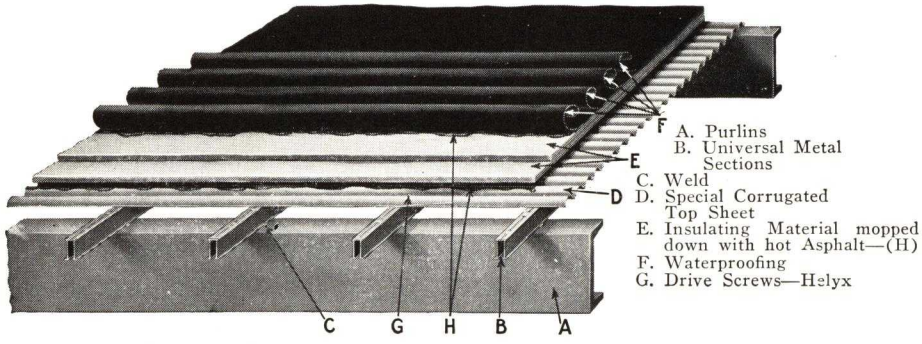
Naturally, it has all the advantages in roof construction common to the standard Holorib Roof Deck.

UNIVERSAL METAL SECTIONS DIVISION

OF INGOT IRON RAILWAY PRODUCTS CO.

MIDDLETOWN, OHIO

UNIVERSAL STEEL ROOF DECKS



Details of Construction of an Insulated Universal Steel Roof Deck

"Universal" is an exceptionally rigid, low-cost steel deck. Extra rigidity is assured by a combination of *two units*—rib sections and corrugated top sheets—installed at right angles to each other. This acts to distribute any applied load equally over the entire deck, first to the corrugated sheets then to the rib sections.

Definite savings can be realized by using a more economical design of trusses, purlins, and other structural steel from the foundation up when Universal Decks are incorporated in the original building plans.

Where They Can Be Used

Universal Decks have been approved by engineers for roof deck construction on practically all types of buildings. They have been installed on large and small structures used for:

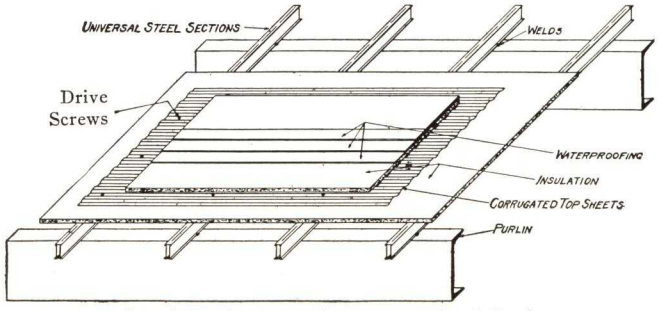
Hotels	Stores	Auditoriums	Apartments
Clubs	Factories	Railroad Stations	Garages
Schools	Theatres	Gymnasiums	Canopies

Wherever light, continuous beams are required for partitions, sidewalls and ceilings, Universal Metal Sections can be used independently of the top sheets. Sections that permit nailing on one or both sides can be supplied for these uses.

Advantages of Universal Steel Decks

Besides their extra rigidity and low cost, Universal Decks have many other advantages.

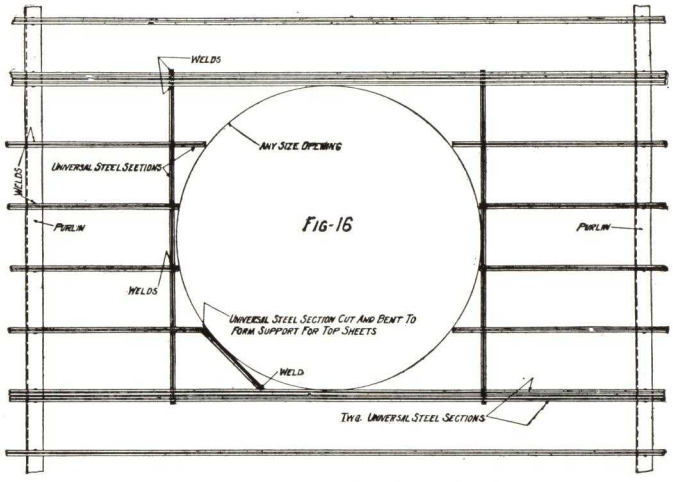
Flexible—Practical variations in the spacing of sections make it possible to carry any normal roof load at any reasonable purlin spacing. It is entirely practicable to install Universal Sections where purlins are spaced at 10 ft. Any size hole may be cut in the deck without additional structural supports, or any section of the deck may be given extra strength.



Sound Deadening with Universal Steel Deck

Sturdy—The fixed continuous beam principle is used for both Sections and top sheets. Sections welded to purlins act as cross bracing. They are fabricated in lengths up to 20 ft.

Light Weight—See Engineering Data table on the following page for weights per square.



Showing How Any Size Opening Can Be Made Without Auxiliary Support

Easy to Install—No complicated engineering layouts are necessary. Universal Sections are usually welded to the structural members. This ties together and firmly supports the compression flanges of purlins.

No Heavy Equipment—Only welding equipment is needed to join the Sections to purlins. An ordinary hammer is used to nail the top sheets to the Sections.

Fire-safe Materials—Since they will not carry flame, the Sections will fail only under conditions which would cause the structural steel to buckle or become greatly distorted.

Insulation Desirable—Steel decks need insulation not only to prevent condensation, but to greatly decrease expansion and contraction of the steel, which might cause the waterproofing felts to buckle and tear apart.

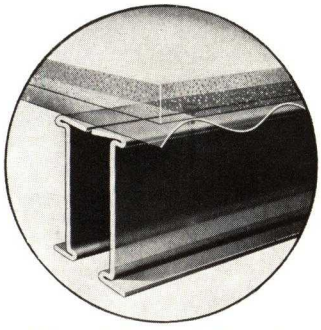
Saves on Fuel—An insulated roof deck helps save fuel in the winter, and serves to keep the building cooler in summer.

Description

Universal Steel Roof Deck consists of Universal Sections fabricated from Armco Ingot Iron or steel, covered with special corrugated sheets. The Sections generally are welded to purlins. They serve as continuous supporting beams.

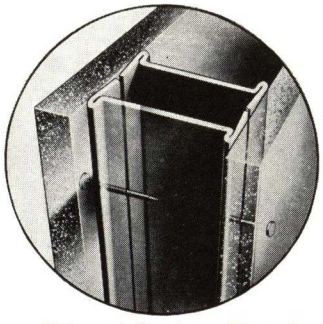
Sections are exceptionally rigid, being 2 in. deep and 1½ in. wide over all, rolled from one piece of 16-gauge strip steel. The 24-gauge top sheets have special 1¼ x ⅜-in. corrugations which assure extra rigidity. Sheets are installed at right angles to the Sections.

Both units are coated with light gray protective paint.



Universal Sections—Type A

Used wherever light, strong, low-cost steel beams are desired; can be easily cut on the job. Lengths up to 20 ft. in stock. Longer units can be supplied. Note the top nailing feature.



Universal Sections—Type B

This Section has a double nailing feature, so that any material may be quickly and easily fastened to both sides. Especially desirable as studding in thin sidewalls and partitions.

Installation Features

Universal Metal Sections are spaced according to engineering formula to carry any required load on the purlin span. They are welded to purlins easily and quickly. Eave projections up to 2 ft. horizontal are satisfactory. Parapet walls need not be weakened by raggle. A corbel is unnecessary, since Universal Sections may be placed in holes in the wall.

Top sheets are nailed to the Section with Helyx or similar nails.

Insulation material is usually applied by mopping the deck or the insulation with hot asphalt. On pitched roofs, Universal Darts are attached to the top sheet to prevent slipping. Although the underside of a Universal Steel Deck is attractive, it may be covered with other materials if additional insulation or special architectural effects are desired.

ENGINEERING DATA—TOTAL LIVE AND DEAD LOADS FOR VARIOUS SPACINGS

Section Modulus .246 Moment of Inertia .246

Universal Section Spacing, in.	Purlin Spacing in Feet										
	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″	8′-6″	9′-0″	9′-6″	10′-0
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	59
8½	.....	.....	.....	.....	.....	.....	.....	.....	.....	57	52
9¼	.....	.....	.....	.....	.....	.....	.....	.....	59	53	48
10	.....	.....	.....	.....	.....	.....	.....	61	55	49	44
10¾	.....	.....	.....	.....	.....	.....	64	56	50	45	41
12	.....	.....	.....	.....	.....	66	58	51	46	41	37
13¼	.....	.....	.....	.....	68	59	52	46	41	37	33
15	.....	.....	.....	70	60	53	46	41	37	33	30
17	.....	.....	72	61	53	46	40	36	32	29	26
20	.....	73	62	52	45	39	35	31	27	25	.....
24	74	61	51	44	38	33	29	26	23	.....	.....
30	59	49	41	35	30	26	23	20	.....	.....	.....

Table based on fs = 18,000 lbs. per sq. in. Deflection not more than 1/250 of span.

Engineering Tests

Excerpts from the report of the James H. Herron Company Testing Laboratories, Cleveland, Ohio:

Test No. 1—"Deflections (under 40-lb. load per sq. ft.) on both 7 ft. 6 in. spans (end spans) average .277 in., while that of 8 ft. 0 in. spans (center spans) average only .112 in.—well within requirements."

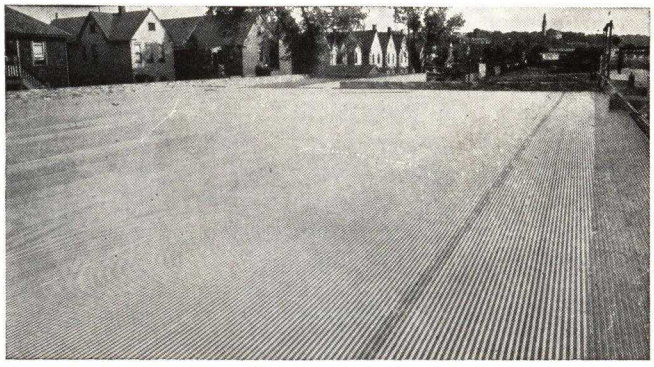
Test No. 2—"A 6-ft. span supported on rollers, load at center, results:

I 1-1 (Moment of Inertia)—.2467 in. 4

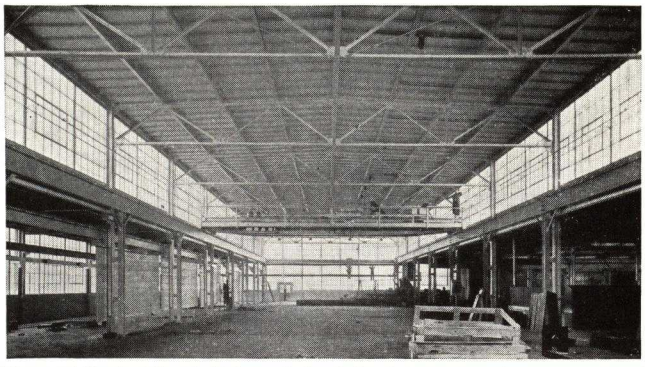
This corresponds extremely close to the computed moment of inertia—I 1-1 = .24644 in. 4."

(The section modulus is the same as the moment of inertia for this beam.)

Test No. 3—"10-ft. span—3 beam loading conditions—single span (both ends free to rise), end span of at least two continuous spans (one end restrained, one end free to rise), interior span (both ends restrained)—concentrated loads used—average deflections are .421 in., .389 in., and .347 in., respectively, which are within (the allowable of) $\frac{1}{250}$ of 10 ft. or .480 in."



Roof of Pocahontas Oil Co. Warehouse, Cleveland, Ohio



View of Underside of Universal Steel Deck at Monarch Machine Tool Co. Plant, Sidney, Ohio
F. E. Freytag, Architect

Mayfield Center Theatre, Cleveland, Ohio

Reports of Users

Universal Steel Decks have been specified and used for hundreds of installations by prominent architects and engineers. Excerpts from original letters on file and may be seen.

This from one of the best known and largest national engineering and contracting companies: "Very satisfactory type of construction."

An architect writes: "Tests made at Columbia University indicate satisfactory strength and deflection values."

A factory owner writes: "A built-up roof of this construction not only creates a roof of strength but also a durable roof at a minimum cost."

THE R. C. MAHON COMPANY

Manufacturers of the Mahon Steel Roof Deck

8650 Mt. Elliott Ave., DETROIT, MICH.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

For Other Mahon Products, see File Index

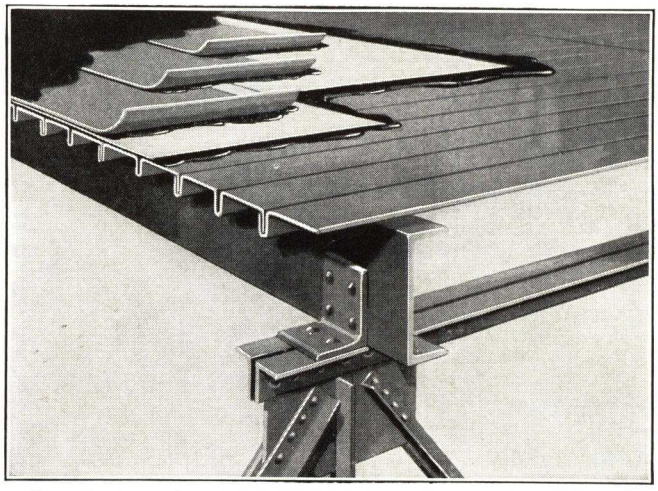
Mahon Steel Roof Deck for Every Type of Roof

The Mahon Steel Roof Deck, details of which are set forth in these pages, offers a roof suited to practically any type of building calling for either flat, pitched or arched roof construction. Mahon Deck Plates can be furnished curved to fit arched roofs—minimum radius 36 ft.

Material

Mahon Steel Roof Deck is furnished in 18 and 20-gauge, in special, tight-coated galvanized steel and requires no painting or maintenance whatsoever. It can also be furnished in copper bearing steel painted if desired.

Mahon has established 20-gauge as a minimum for roof deck plates as a result of exhaustive tests which indicate this as the lightest material that can be safely and economically utilized. Weight impacts would be likely to seriously affect roofs of lighter gauge.



Cross Section of Mahon Steel Roof Deck Showing Application of Insulation and Waterproofing

Standard Assembling Clips

The laying of a Mahon Steel Roof Deck requires only the installation of the steel clips by which the plates are fastened together as they are assembled, and by which they are fastened to the supporting structural steel. Mahon clips have been designed primarily for simplicity, and they have in every instance a strength more than adequate for the work they are called upon to perform.

A special Mahon Clip can be furnished for welded construction, or Mahon Steel Roof Deck can be welded directly to the structural purlins eliminating thereby the use of part or all of the assembling clips.

There is not in the design of the Mahon Steel Roof Deck any part which can work up, become loose or in any way act to rupture the insulation or roofing material.

Installation

The Mahon Steel Roof Deck consists of one standard roof plate and three standard clips by which the plates are fastened together and to the supporting framework.

The laying of a Mahon Steel Roof Deck is a simple operation. The work, due to the ingenious design of parts, can proceed swiftly and is done entirely from the upper side of the roof. Every plate of a Mahon Steel Roof Deck interlocks with the preceding unit. There are no end fittings—the ends being lapped one over the other. All lap joints occur directly over purlins. All clips are installed from the top as the plates are put in place.

Mahon Standard Steel Roof Deck Plate

Intermediate Clip Locking Roof Deck Plates Together Midway Between Purlins

Beam or Purlin Clip for Attaching Roof Deck Plates to Beam or Channel Purlins

Special Clip for Use in Welded Construction

Note that the Steel Deck proper cannot be burned in the welding process

Installing Mahon Steel Roof Deck on the Latrobe Electric Steel Co. Plant, Latrobe, Pa.

An Integral Unit Roof

Mahon Steel Roof Deck when installed functions as a single steel plate, the separate units becoming an integral part of one interlocking whole when assembled. A feature of the Mahon Steel Roof Deck which makes for extra rigidity and strength is the location of all end lap joints directly over purlins. The minimum end lap is 2 in. No unsightly laps or joints are visible from the underside of the Mahon Deck.

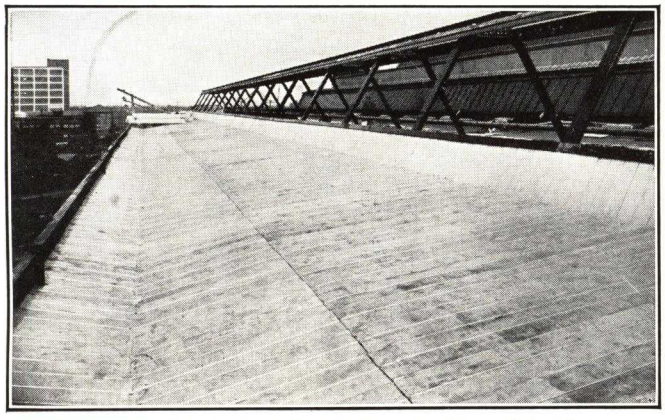
All plates in the Mahon Deck lay 12 in. wide when installed, ribs 1½ in. deep are 6 in. on centers. Every second rib where plates interlock provides three thicknesses of metal. Each deck plate is locked with special clips to the adjoining plates between purlins to prevent deflection of individual plates due to localized loading. This feature eliminates the possibility of loosening the bond between insulation or roofing material applied to the deck.

Underside of Mahon Steel Roof Deck

Note the clean, even appearance and the absence of end joints

Monitor Curb Walls

The projecting ribs on the plates of the Mahon Steel Roof Deck can be cut and the sheet turned up to form curb walls under sills in monitor or sawtooth construction.



Mahon Steel Roof Deck Installed on the Hupmobile Plant, Detroit, Mich.

Note the deck-formed saddles adjacent to the parapet wall

Saddles

On many types of buildings, where Mahon Steel Roof Deck is employed, built-up saddles are unnecessary. Saddles may be created by warping the roof deck. This is accomplished by setting purlins in drainage section at desired angle to produce ridges and valleys—usually an angle of ¼ in. to the foot is sufficient. No extra roof deck plates are required and it does not involve cutting or fitting. Saddles for either sloping or vertical face sawtooth buildings may be economically built from Mahon Steel Roof Deck plates cut to fit.

To meet conditions where the aforementioned methods are impracticable, saddles may be built from any material of a permanent nature—in which case we recommend the application first of a layer of asphalt or tarred felt on the steel deck proper.

Insulation

The Mahon Steel Roof Deck is a complete structural unit, and requires no insulation for stiffness or rigidity—these factors being amply provided for in the deck itself. In the case of unheated structures, such as loading docks, warehouses and the like, insulation is not necessary.

In buildings that must be heated or where condensation is a problem we recommend the use of insulation of any approved type—amount of insulation will be governed by the geographic location and type of occupancy.

Composition Roofing

Any standard composition roofing can be used over the Mahon Steel Roof Deck. Sheets should be mopped solid similar to roof construction over concrete.

Fire Safety

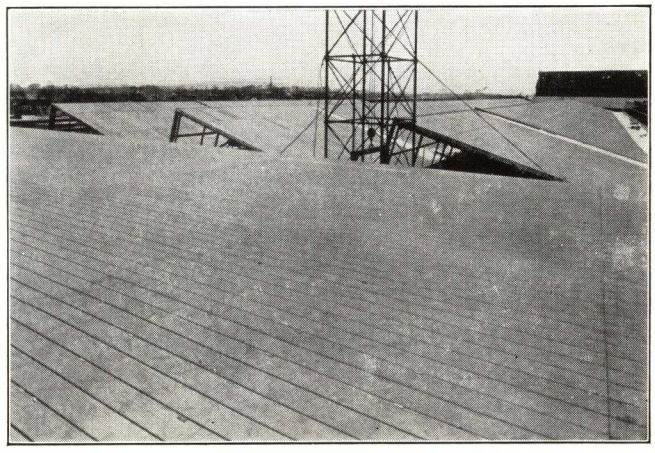
No matter what type of occupancy a building is designed for, building codes in centers of population demand fire safety. Mahon Steel Roof Deck provides the utmost in fire safe roof construction, and will obtain for the owner a low insurance rate.

Engineering Data

Light Weight—The weight of Mahon Steel Roof Deck is such that it permits considerable economies in construction. Mahon 20-gauge deck weighs 2.5 lb. per sq. ft. and the 18-gauge deck weighs 3.25 lb. per sq. ft. Total weight of roof will depend on type and amount of insulation and type of roofing material used.

Expansion and Contraction—These difficulties have been entirely obviated in the design of Mahon Steel Roof Deck. Note in the ribs an ample allowance for lateral expansion and contraction, and also that longitudinal expansion and contraction of the deck plate is provided for in the lap joints.

Deflection—Mahon Steel Roof Deck, due to ingenious arrangement of locking clips, and interlocking of plates when assembled, builds up a continuity of support throughout the entire roof surface which distributes and greatly reduces deflection caused by any localized loading. Deflection in Mahon Steel Roof Deck, installed with normal purlin spacings, therefore, becomes a negligible factor.



Mahon Steel Roof Deck (110,000 Sq. Ft.) Installed on the New Plant of Bowen Products Corp., Detroit, Mich.

MILCOR STEEL COMPANY

MILWAUKEE, WIS. CANTON, OHIO

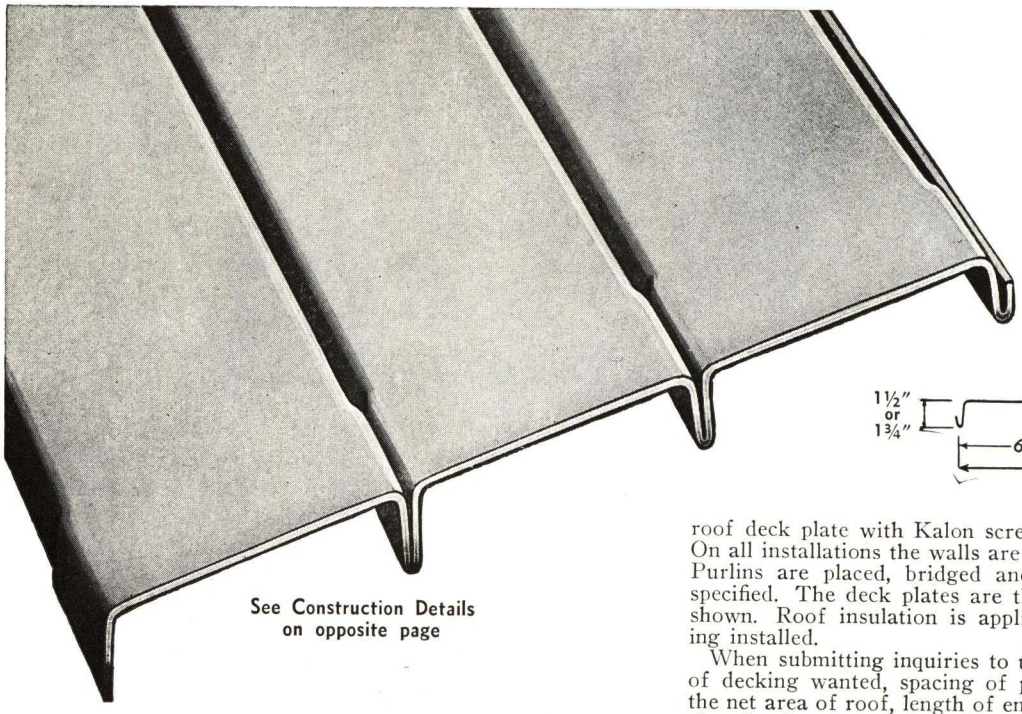
Send Inquiries to 4139 W. Burnham Street, Milwaukee, Wis.

PLANTS AND WAREHOUSES AT:
MILWAUKEE, WIS.; CANTON, OHIO; CHICAGO, ILL.; KANSAS CITY, MO.; LA CROSSE, WIS.; ROCHESTER, N. Y.; NEW YORK, N. Y.; ALTANTA, GA.

SALES OFFICES IN PRINCIPAL CITIES

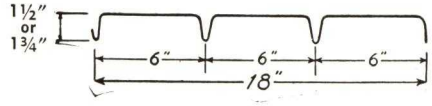
For Our Catalogs on Milcor Fireproof Products, Ventilators and Access Doors, see File Index

MILCOR STEEL ROOF DECK



See Construction Details on opposite page

- Unique offset for nesting ribs.
- Depth of ribs—1½ or 1¾ in.
- Spaced on 6-in. centers.
- Width of plate—18 in.
- Complete with screws and clips.
- Fabricated from black annealed copper alloy, and tight coat galvanized steel.
- In lengths to meet varying conditions.



Description—Milcor Roof Deck is furnished in lengths to meet varying conditions. The over-lapping ends and interlocking sides insure speedy installation.

Milcor Roof Deck is formed with ribs 1½ in. or 1¾ in. deep, spaced on 6-in. centers, and is furnished with 18-in. width of plate. The ribs are depressed at one end to permit easy nesting, where laps occur. Laps are always made directly over purlins, and are not less than 2 in. in length.

Materials—Fabricated from copper alloy steel, and tight-coat galvanized steel.

Engineering Service—We maintain an Engineering Department for your convenience in estimating. Send us roof plans and we will supply you with details.

Installation—On installations where a close fit to side and end walls is required, we furnish an end plate which is installed as shown. This end plate is fastened to the adjoining roof deck plate with Kalon screws (furnished with the deck). On all installations the walls are flashed down over the decking. Purlins are placed, bridged and secured to their support as specified. The deck plates are then anchored to the purlins as shown. Roof insulation is applied as specified, and the roofing installed.

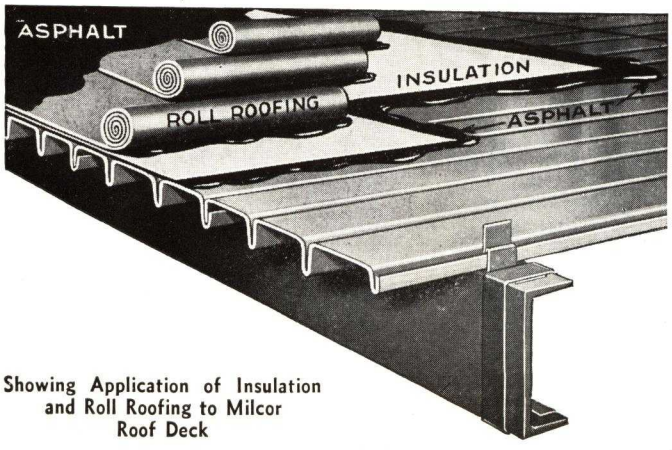
When submitting inquiries to us for estimate, stipulate gauge of decking wanted, spacing of purlins and required live load, the net area of roof, length of end wall, and length of side wall, also size, location, and spacing of supports.

Also indicate whether roof is of single or double pitch construction and if roof deck plates are to project beyond outside wall line or if a parapet wall carries above roof deck level. The specific anchor requirements are determined when making the lay-out.

TABLE OF SAFE LOADS FOR MILCOR ROOF DECK

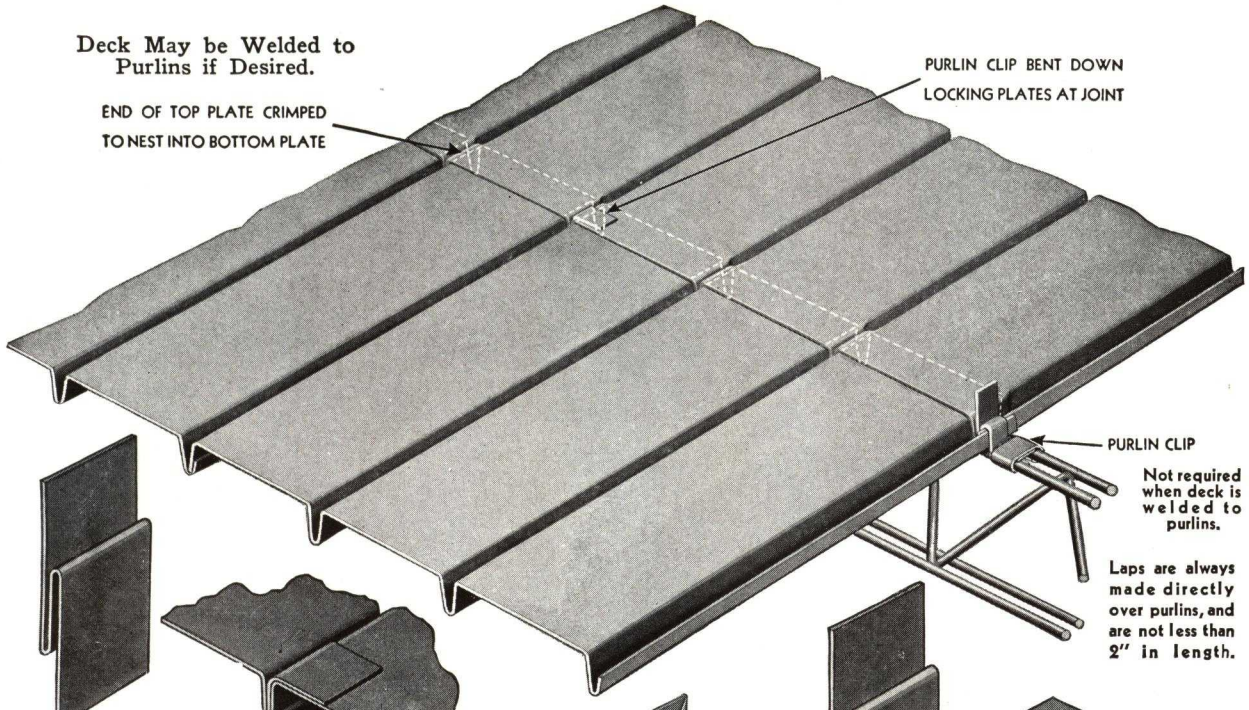
Total Safe Uniformly Distributed Loads in Pounds per Square Foot
Maximum deflection allowed is one two-hundred and fiftieth (1/250) of span in inches, based on a uniform load

Gauge	Spacing of Ribs, in.	Weight per 100 sq.ft.	Purlin Spacing, ft.-ins.													
			4-0		4-6		5-0		5-6		6-0		6-6		7-0	7-6	8-0
	Ribs, ins.		1½	1¾	1½	1¾	1½	1¾	1½	1¾	1½	1¾	1½	1¾	1½	1¾	1¾	1½
22	6	180	210	79		62		50	65	41	53	35	45	30	38	27	33	29	26
20	6	215	250	95		75		62	80	50	65	42	55	36	47	31	41	35	31
18	6	285	330	125		100		81	103	67	87	56	73	48	62	41	53	47	43

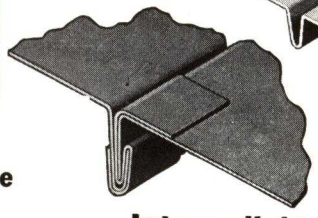


Showing Application of Insulation and Roll Roofing to Milcor Roof Deck

Milcor Roof Deck Is Easy and Economical to Install

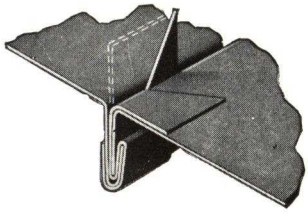


Intermediate Clip



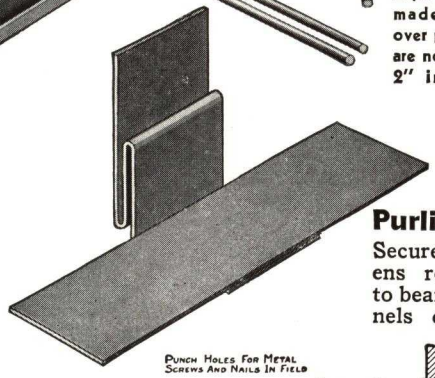
Intermediate Clip

Locking plates together midway between purlins —for Spans 5'6" and over.



Intermediate Clip Locking Plates with Prong for Holding Insulation.

Intermediate Clip, Slit for Insulation Prong.

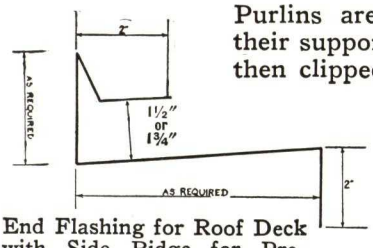


Purlin Clip

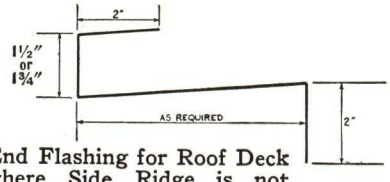
Securely fastens roof deck to beams, channels or joists.

CONSTRUCTION DETAILS

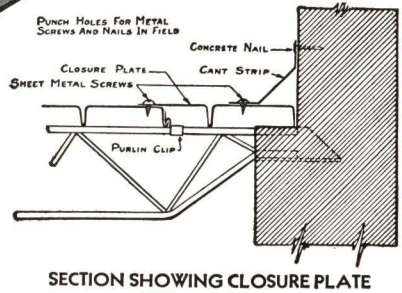
Purlins are placed, bridged and secured to their support as specified. The deck plates are then clipped or welded to the purlins.



End Flashing for Roof Deck with Side Ridge for Prepared Roofing.

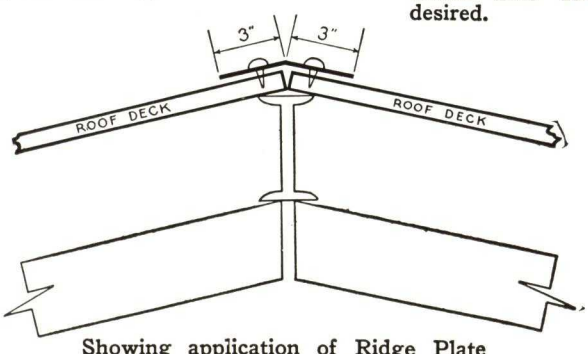


End Flashing for Roof Deck where Side Ridge is not desired.

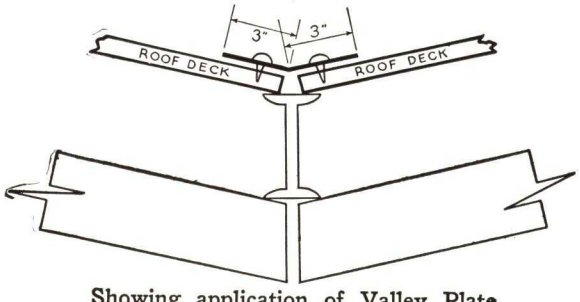


SECTION SHOWING CLOSURE PLATE AND CANT STRIP

On installations where a close fit to side and end walls is required, we furnish a closure plate which is installed as shown. This closure plate is fastened to the adjoining Roof Deck Plate with Kalon screws. On all installations the walls are flashed down over the decking.



Showing application of Ridge Plate to Steel Roof Deck



Showing application of Valley Plate to Steel Roof Deck

WHEELING CORRUGATING COMPANY

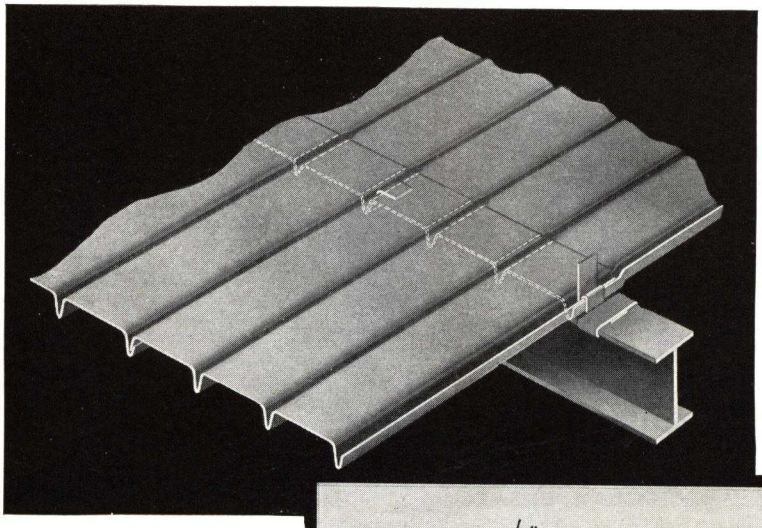
Steel Roof Decks

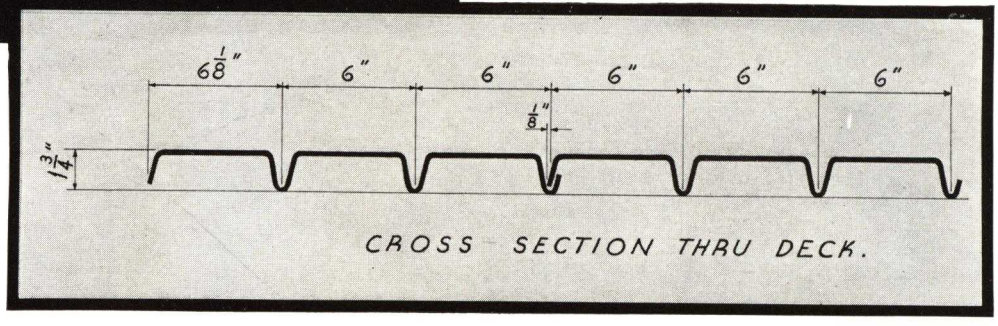
WHEELING, W. VA.

ATLANTA, GA.
BUFFALO, N. Y.
CHICAGO, ILL.
COLUMBUS, OHIO
DETROIT, MICH.
KANSAS CITY, MO.
LOUISVILLE, KY.
MINNEAPOLIS, MINN.
NEW YORK, N. Y.
PHILADELPHIA, PA.
RICHMOND, VA.
ST. LOUIS, MO.

For Wheeling Steel Floor and Roof System, see File Index

Wheeling Tri-Rib Steel Roof Decks are made of 18, 20 or 22-gauge Cop-R-Loy sheets 18 ins. wide reinforced with three ribs spaced 6 ins. on centers and in continuous lengths up to 22 ft., permitting continuous spans over purlins. They speed up roof construction because they minimize the number of parts to be handled and can be quickly attached to the purlin by the use of clips or, if preferred, the deck may be welded to the purlin eliminating the use of purlin clips. Illustration on the left shows the purlin clip in place, also the intermediate clip. All erection work is done from the top of the deck. The individual units lap at the ends for rigid construction and an even surface. As soon as the roof deck is laid, roofers can proceed immediately with the application of insulation and roofing.





(1) Engineered to the job, no cutting or fitting required.

(2) Easy and economical to erect. All erection operations are performed from the top of the deck.

(3) All deck units are 18 ins. wide, thus reducing to a minimum the number of units to be erected.

(4) Minimum end laps of 4 ins. insure a rigid even surface througout.

(5) Designed for easy assembly of all units, overlapping ends never have to be forced in place.

(6) Made from Cop-R-Loy painted or galvanized, thereby insuring extra long life to the steel deck.

SAFE, UNIFORM LOAD PER SQUARE FOOT

Span, ft.	22-gauge	20-gauge	18-gauge
4	110	125	..
5	72	85	110
6	48	57	75
7	..	40	55
8	..	..	40

AMERICAN CYANAMID AND CHEMICAL CORPORATION

STRUCTURAL GYPSUM DIVISION

EXECUTIVE OFFICES

1252 Sixth Avenue, NEW YORK, N. Y.

TELEPHONE CIrcle 7-0100

SALES OFFICES IN THE PRINCIPAL EASTERN CITIES

PRODUCTS

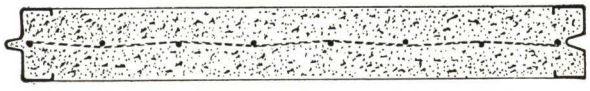
Gypsteel Plank; Gypsteel Pre-cast Composite Floor Arch; Gypsteel Pre-cast Roofs; Gypsteel Pre-cast Ceilings; Gypsteel Partition Tile, Beam and Column Covering (see File Index); Gypsteel Plasters (see File Index).

Gypsteel Pre-cast products and Gypsteel Plasters are manufactured from calcined gypsum produced by the exclusive Gypsteel Process. Calcined gypsum is one of the oldest of building materials and, until the development of this process, was manufactured only from rock gypsum, a mineral that is mined or quarried. Under the Gypsteel Process we "manufacture" gypsum, free of the impurities but otherwise identical in composition with nature's product.

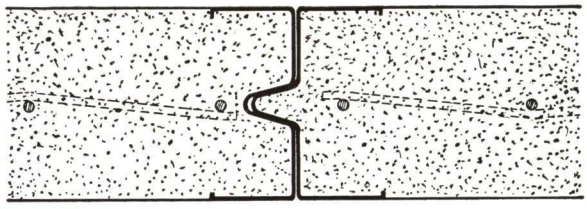
GYPSTEEL PLANK*

Gypsteel Plank is a pre-cast building unit manufactured in forms and sizes that are similar to and as easy to handle as lumber. Its principal uses are as lightweight floor slabs and roof decks that afford the permanence and fire-safety of masonry construction. Plank is simply a slab of extra dense, nailable gypsum, reinforced with mesh and bound on sides and ends with a one-piece galvanized steel frame, tongued and grooved like wood.

Gypsteel Plank is manufactured in two sizes, depending upon the spans and loads to be carried.



Cross Section Through Senior and Junior Plank
Weight 12 lbs. per sq. ft.



Half-size Section of Tongue and Groove Joint of Senior and Junior Plank
Showing how they mesh to form a continuous steel I-beam, 2-in. deep.
Note: The ends as well as the sides are tongued and grooved

Senior Plank

2 in. thick, 15 in. wide, 10 ft. long.

For roofs on spans up to 7 ft. and for floors on spans up to 5 ft.

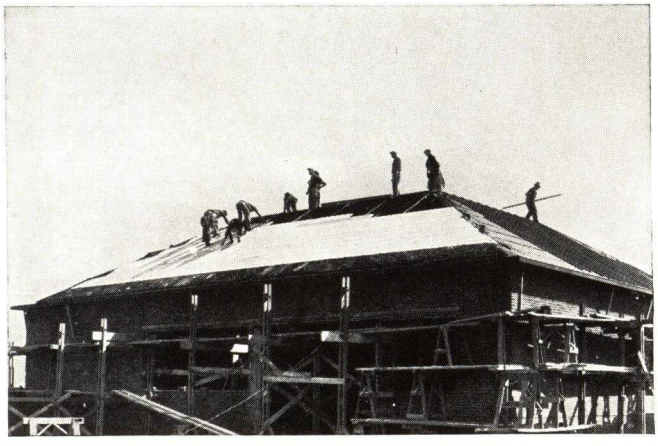
Junior Plank

2 in. thick, 15 in. wide, 6 ft. long.

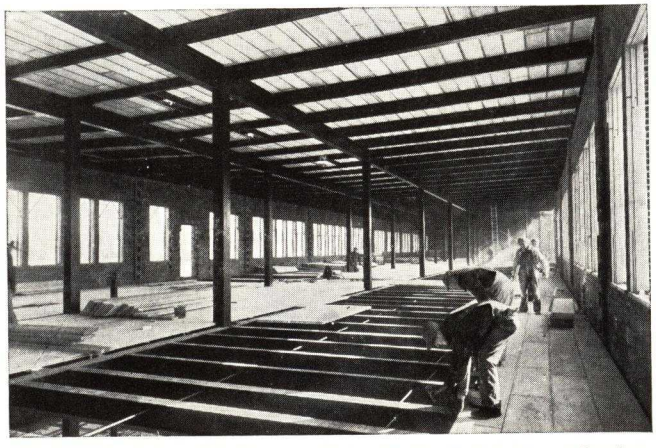
For roofs on spans up to 4 ft. and for floors on spans up to 3 ft.

LOAD TABLE FOR GYPSTEEL PLANK
(Total safe super-imposed load in pounds per square foot)

Senior plank				Junior plank		
4′0″	5′0″	Roofs only		2′0″	3′0″	Roofs only 4′0″
		6′0″	7′0″			
150	150	75	75	150	120	75



Cut-up Roofs, Steep Pitches—Bring Out the Advantages of Gypsteel Plank



Plank Is Laid Just Like Lumber, But with the End Joints at Random Regardless of Location of Supports

*The term Plank, as applied to cementitious building products, is a trade mark of American Cyanamid and Chemical Corporation.

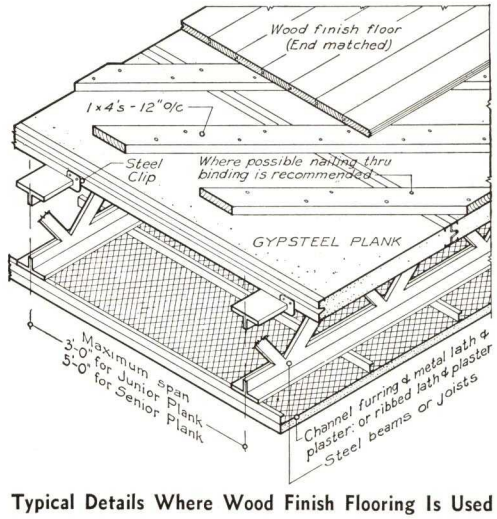
APPLYING GYPSTEEL PLANK

Plank is laid directly over wood or steel members of any type and either uniform or variable spacing up to 7 ft. on roofs, and up to 5 ft. on floors. It may be nailed direct to wood supports, or attached to a steel frame by means of simple clips.

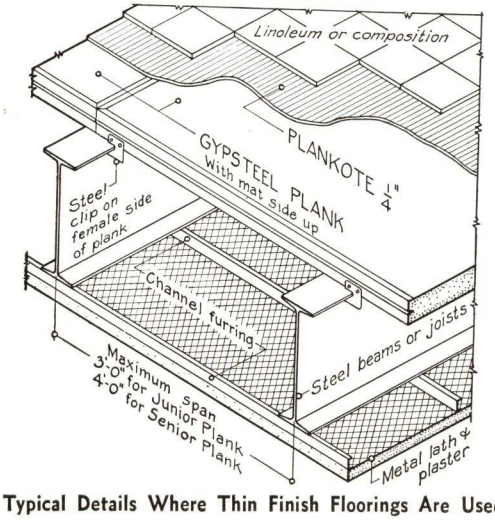
Plank is erected *without regard to joist or purlin spacing* by staggering end joints. *Joints need not come over the supports.* There are no joints to grout, forms to erect, nor delays from freezing weather.

The strength of a Gypsteel Junior or Senior Plank floor or roof is in the meshed steel binding. This binding forms a 2-in. steel I-beam, stiffened by the gypsum core, locking all units together and evenly distributing loads that may be concentrated on one or more units.

For floors or flat roofs, where a metal lath and plaster ceiling is to be installed below, the choice is offered of using either Junior Plank with light steel joists spaced up to 3 ft. on centers or Senior Plank over light steel beams that may be spaced up to 5 ft.** apart. With the Junior Plank-open web joist combination we have the advantage of the cheaper floor slab and a somewhat more economical ceiling. On the other hand, the Senior Plank-beam combination reduces the cost of the steel frame and usually provides a more rigid construction.



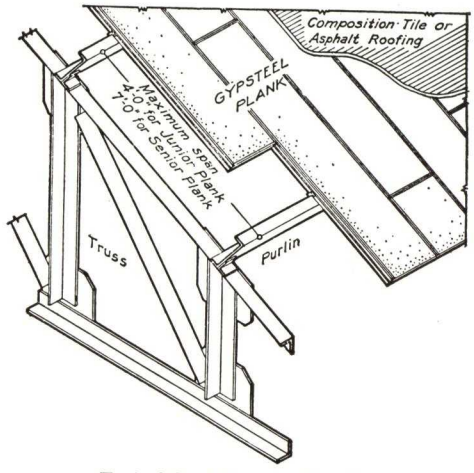
Typical Details Where Wood Finish Flooring Is Used



Typical Details Where Thin Finish Floorings Are Used

Practically any type of standard finish flooring may be applied over Plank. Ordinary double floors are laid by simply nailing the rough flooring direct to the Gypsteel Plank (satisfactory and economical results are obtained using 1x4s, spaced about 12 in. on centers), and then laying the finished flooring in the usual manner. Linoleum, mastic tile and similar flooring may be laid over a ¼-in. minimum coat of Plankote* troweled over the Plank surface by the flooring contractor. Plankote, manufactured by this corporation, bonds perfectly with Gypsteel, sets quickly and firmly, and is easily troweled to a smooth hard finish.

For roofs, where the ceiling side is exposed, economy recommends the use of Senior Plank with the purlins spaced as far apart as is consistent with the load requirements. Any type of standard roofing is easily applied. For built-up roofings, follow the usual specifications for application over wood decks, nailing the first layer of paper or felt, and spot mopping, if desired, but not mopping the entire area. Shingle, slate, and other roofings of this type may be nailed direct to Plank using *square cut nails* penetrating 1½ in.



Typical Roof Framing Details

Plank may be installed on either flat or pitched roofs and may be run either across or with the slope. On steep slopes provide stop angles or bolt plank frequently to steel to take up roof thrust.

ADVANTAGES

1. Plank may be nailed, sawed, cut or bored as readily as wood.
2. No waste because of laps or cutting; the shortest piece may be used.
3. Easy to handle and erect; requires only carpenter's tools.
4. Will not rot, shrink, or warp; vermin and termite proof.
5. Absolutely incombustible.
6. Unusually high insulating properties.
7. Eliminates form work and water in construction; there is no waiting for material to "set."

Send for complete catalog and price list.

*Trade Mark.

**With thin finishes we recommend spans be limited to 4 ft. to assure adequate stiffness.

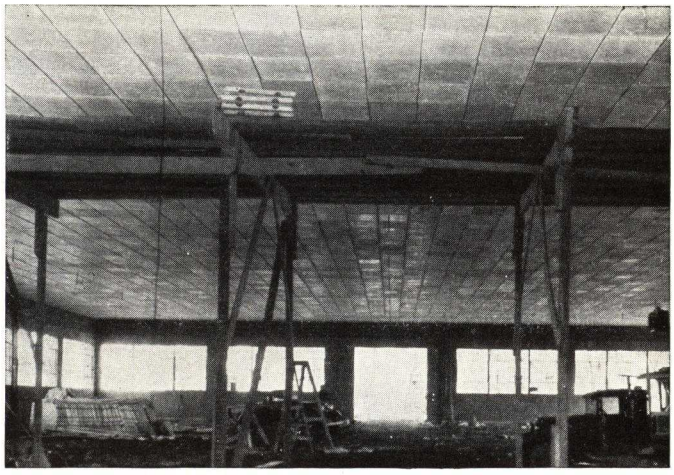
GYPSTEEL PRE-CAST CEILING SLABS

Gypsteel Precast Ceiling Slabs are designed to furnish a flat ceiling of class "A" fireproof construction in steel frame buildings of any type.

Used in combination with Senior or Junior Plank, they are suspended beneath the supporting steel, completely fireproofing these members with 2 in. of solid gypsum, and making possible a light weight, flat ceiling floor system with the highest fireproof rating.

Suspended beneath the bottom chords of roof trusses, Gypsteel Pre-cast Ceilings not only fireproof the steel, but effect substantial savings in fuel through their own high insulating value and by isolating the normally unused space above the bottom chord.

Gypsteel Ceilings are approved for first-class construction by the building of departments of principal cities.



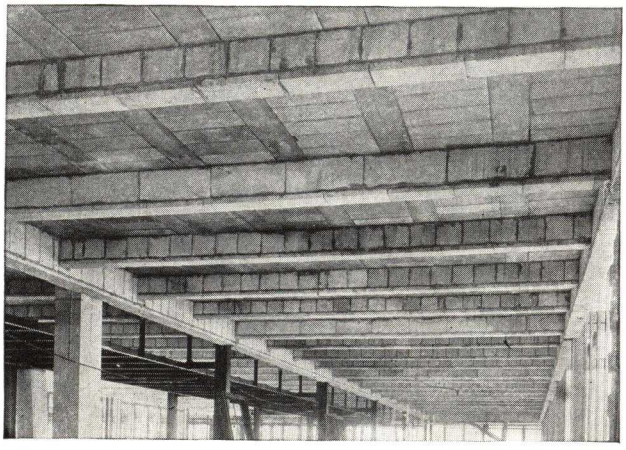
Gypsteel Ceilings Afford Full Protection to Floors and Roof Beams and Provide an Excellent Plaster Base

GYPSTEEL COMPOSITE PRE-CAST FLOOR ARCH

Gypsteel Composite Pre-cast Floor Arch is a thoroughly practical and economical fireproof floor construction, free from form work and water, suitable for general building construction for spans between supporting members up to 8 ft.

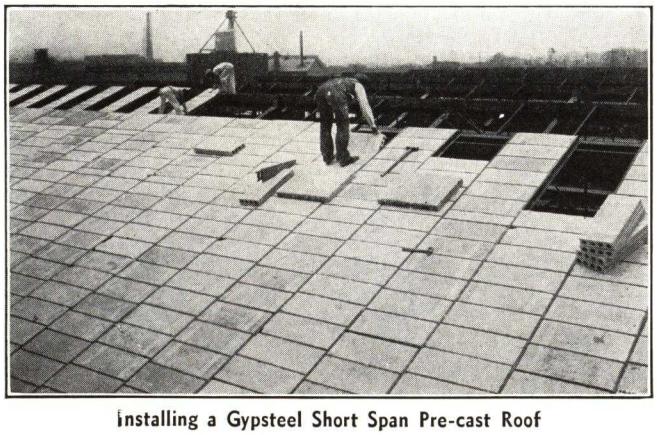
It is adaptable to all classes of fireproof steel frame buildings, being fully approved by the building departments of principal cities for buildings of the first class and for live loads of 150 lbs. per sq. ft.

Because it is light in weight the composite Floor Arch permits substantial savings in the tonnage of steel required for beams, girders, and columns over the typical short span concrete arch construction.



With the Beam and Girder Fireproofing Installed the Gypsteel Composite Floor Is Ready for Plaster

GYPSTEEL SHORT SPAN PRE-CAST ROOF



Installing a Gypsteel Short Span Pre-cast Roof

Consists of slabs 30 in. in length supported by sub-purlins spanning the distance between the main purlins. For the greatest economy, they should be installed upon Gypsteel Sub-purlins, especially developed for this purpose. They may also be supported by tees, angles, light rails, junior beams, or metal joists. Slabs are available in various thicknesses from 2½ in. to 4 in., both solid and hollow.

Especially adaptable for curved surfaces, very irregular roofs, or those with numerous hips, valleys, or dormers, and also very steep pitched roofs.

MISCELLANEOUS PRODUCTS

A complete line of pre-cast gypsum units for beam, girder and column fireproofing, as well as all standard sizes of gypsum partition tile, are available under the Gypsteel trademark. The corporation also markets a complete line of gypsum plasters of the highest quality.

LATHROP-HOGE GYPSUM CONSTRUCTION CO.

Gypsum Floors and Roofs

1426 Clay Street, CINCINNATI, OHIO

BRANCH OFFICES

ATLANTA, GA., 528 Hurt Building
BUFFALO, N. Y., 190 Delaware Avenue
CHICAGO, ILL., 111 W. Washington Street
DALLAS, TEX., Burt Building
DETROIT, MICH., 439 Penobscot Building
PHILADELPHIA, PA., 1600 Arch Street
MINNEAPOLIS, MINN., 700 National Building
NEW YORK, N. Y., Graybar Building
PITTSBURGH, PA., 419 Melwood Street
ST. LOUIS, MO., 3605 Laclede Avenue

REPRESENTATIVES IN OTHER PRINCIPAL CITIES

Products

MONOLITHIC GYPSUM FLOOR and ROOF CONSTRUCTION:

Standard Suspension Type.

Hoge Subpurlin Type (U. S. Patent 1,464,711; Canadian Patent 241,477).

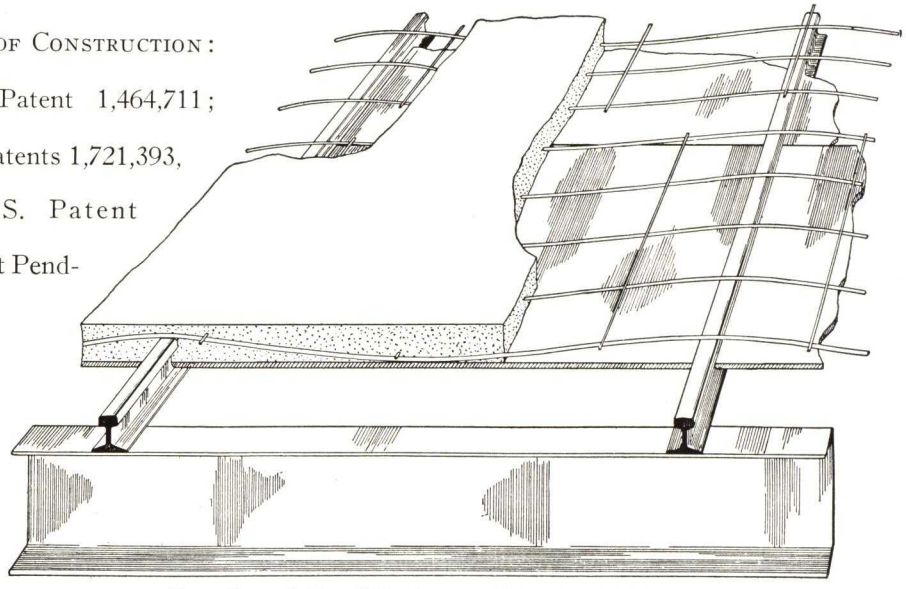
Enclosed Subpurlin Type (U. S. Patents 1,721,393, 1,814,387; Canadian Patent 254,632).

La-Ho-Co Precast Type (U. S. Patent 2,118,207).

La-Ho-Co Monolithic Type (Patent Pending).

Construction Service

This company, backed by over 30 years' experience in gypsum construction, is at your service for advice and estimates for the above types of construction installed complete in any part of the world.



Hoge Type of Monolithic Gypsum Floor and Roof Construction

Advantages of Subpurlin Types

The subpurlin types of construction have all the advantages of light weight, rapid erection, high insulation properties, fire resistance, vibration resistance, permanence, strength and excellent undersurface appearance.

The simplicity of the subpurlin designs permits adaptation to any layout of supports by varying the size of subpurlin in accordance with standard structural design. Subpurlins bear on walls and no special bracing of purlins is required as with other designs.

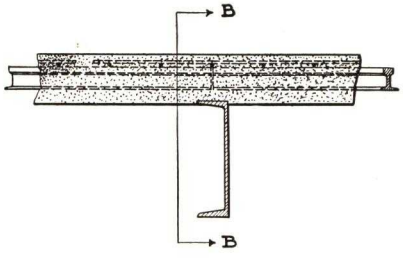
In replacement of old roofs and floors where applications to framing are difficult, or where a uniform paneled undersurface is desired, its use has been found particularly advantageous.

Subpurlin Types of Monolithic Gypsum Floor and Roof Construction

The approval of architects, engineers, and owners throughout the United States and Canada is convincing proof that the Hoge and the Enclosed subpurlin types are well suited to the great majority of conditions, and conform readily to the standards of design and appearance required by architects.

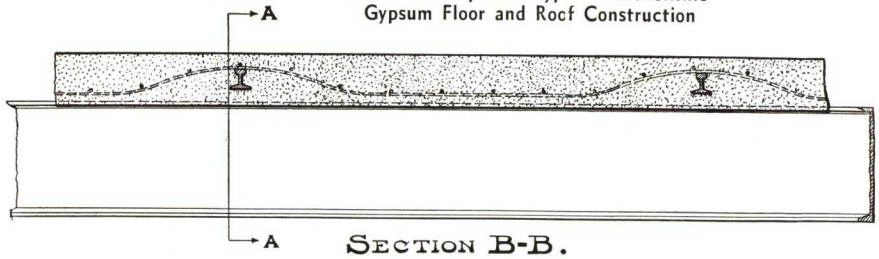
Hoge Subpurlin Type—In the Hoge type small subpurlins are laid about 32 in. apart on the top of walls, beams or purlins spanning the distance between beam or wall supports. On the lower flanges of the subpurlins are supported standard gypsum board, insulation or other composition board, with joints made over purlins, to form a solid undersurface, paneled by the lower flanges of the subpurlins. The subpurlins are designed to carry all loads, which are transferred to them by continuous mesh reinforcement running across and resting over top of the subpurlins. Standard gypsum composition is poured in place over the gypsum board or insulation board and finished smooth to the required slab thickness, ready to receive the roof or floor finish. The undersurface can be left with the attractive composition board finish or may be decorated as desired.

Enclosed Subpurlin Type—Where fireproofing or greater insulation value is desired, the subpurlins are supported on the purlins or blocked above the top of purlins with insulating material. Removable forms are so placed as to permit covering the bottom of the subpurlins with ¾-in. or more of gypsum composition, leaving a solid, plain gypsum undersurface even with the top of the purlins, the full thickness of the slab being above the superstructure, yielding maximum insulation value.



SECTION A-A.

Enclosed Subpurlin Type of Monolithic Gypsum Floor and Roof Construction



SECTION B-B.

LA-HO-CO MONOLITHIC AND PRECAST ROOF DECKS

Although the subpurlin types described above are suitable for the great majority of conditions found in building construction, we also offer a variety of La-Ho-Co designs carried on subpurlins spaced from 15-in. c. to c. to 32-in. c. to c., for those conditions where either extremely light weight, lower prices, or increased insulation value is desired. (Detailed information will be sent on request.)

NATIONAL GYPSUM COMPANY

Monolithic Poured-in-Place Gypsum Floor and Roof Construction

GENERAL OFFICES
BUFFALO, N. Y.

For our Catalog on Gypsum Products, see File Index

This Type of Construction, in Use for Almost a Half Century, Has Been Further Improved by a Patented Method Which Makes This System Preferable from Every Standpoint . . . Quickly Constructed, Permanent, Fireproof, Inexpensive

Poured-in-Place Gypsum Roof Construction Which Actually Becomes An Integral Part of the Main Steel Construction
Withstands vibrations and will resist storms and cyclones sufficient in force to destroy roofs of conventional design

SIX OUTSTANDING ADVANTAGES

1. **Light Weight**—Slab weighs only one-third as much as concrete, thus reducing the dead load and decreasing the cost of supports and foundations.
2. **Rapid Construction**—Slab may be used within an hour, and the roof covering can be placed if desired the following day.
3. **High Insulation Value**—Four times the insulation value of concrete. Reduces fuel consumption and heating equipment requirements. A building that is warmer in winter and cooler in summer.
4. **Fireproof**—Gypsum construction as fireproofing for steel has successfully passed numerous fire tests, and is generally recognized as being equal to other material as fireproofing for steel work, with a minimum of dead load.
5. **Vibration Crack Resistant**—Owing to the toughness and elasticity of the gypsum composition there is a noticeable absence of vibration cracks on all installations of this material.
6. **Low Maintenance Cost**—Repairing and maintenance cost is low. Slab is easily cut where changes in construction are necessary. Nails can be driven in slab to secure slate, tile, etc.

Monolithic Gypsum construction for floors and roofs (gypsum fibre concrete with steel reinforcing) has long been favored for its permanence and economy.

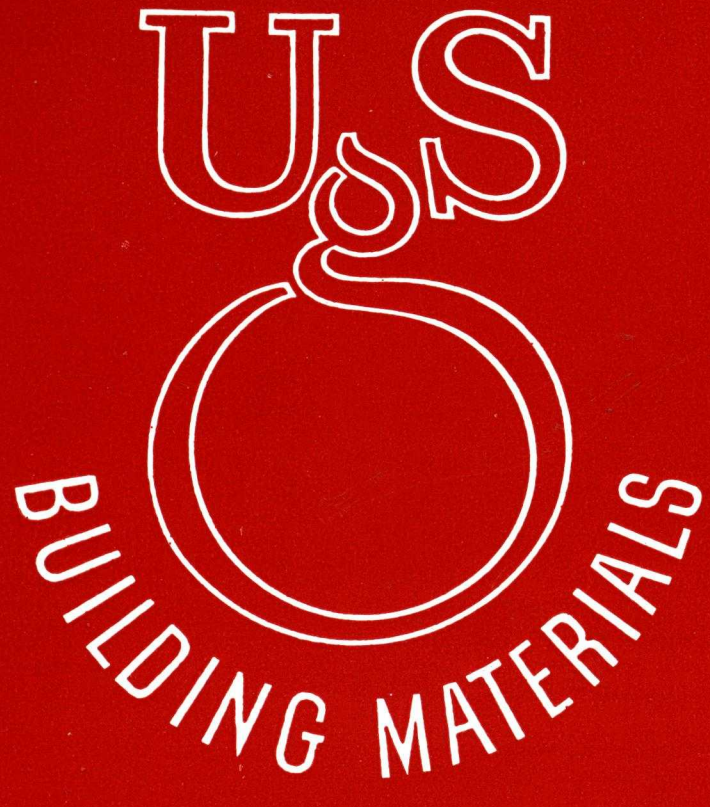
The natural advantages of this construction have been further enhanced by a patented method which permits of more rapid installation and incidentally may be designed for any required loading condition.

The roof construction design, absolutely perfect from an engineering standpoint, permits the roof to become an integral part of the main steel construction—the undersurface providing an attractive ceiling that requires no decoration.

Speed of erection, permanence, effective insulation and fireproofing, plus low initial cost combine to make this system outstanding. For further details, please write National Gypsum Company, Buffalo, N. Y.

MEMORANDA

THE RED BOOK



1939 EDITION

UNITED STATES GYPSUM COMPANY

UNITED STATES GYPSUM COMPANY

Engineering Sales Division

SALES OFFICES IN ALL PRINCIPAL CITIES—FOR LIST SEE BACK COVER

• • •

GYPSUM CONSTRUCTIONS
ROOFS, FLOORS, PARTITIONS, FIREPROOFING

• • •

SHEETROCK-PYROFILL and WEATHERWOOD-PYROFILL ROOF CONSTRUCTIONS

The Sheetrock*-Pyrofill* Roof Deck is a reinforced gypsum roof construction poured-in-place over permanent Sheetrock forms. There are no joints for heat loss, and the monolithic construction helps stiffen the building structure.

The weight of Sheetrock-Pyrofill roof construction is but 11½ pounds per square foot for a six-foot purlin spacing, and 12½ pounds per square foot for an eleven foot purlin spacing. Regardless of how great the spacing is between purlins, the gypsum spans only 32½ inches—the spacing between sub-purlins. The sub-purlins are designed on the basis of standard beam formulae to carry the total live and dead load.

In load tests conducted by Columbia University, more than 500 pounds per square foot uniformly distributed load was required to break the 2½-inch thick Sheetrock-Pyrofill roof slabs. This is an exceptionally strong, durable construction.

The undersurface of the Sheetrock-Pyrofill Roof Deck consists of Sheetrock 32 inches wide, in lengths equal to the purlin spacing so that end joints occur over the main purlins. With the Sheetrock joints thus concealed, a smooth, attractive, light-reflecting undersurface results.

The Weatherwood*-Pyrofill Roof Deck construction, except for the substitution of Weatherwood for Sheetrock for the permanent forms, is identical with the Sheetrock-Pyrofill construction.

The undersurface of the Weatherwood-Pyrofill construction consists of either ½-inch or 1-inch thick Weatherwood insulating board 32 inches wide and in lengths equal to the purlin spacing. Thus all end joints occur over the main purlins.

The sub-purlins used in these two roof deck constructions are light rails or tees laid at right angles to the main purlins and spaced approximately 32½ inches on centers and clipped to the main purlins.

The reinforcing in the gypsum slab is a continuous, electrically welded, galvanized steel fabric, especially made to USG specifications, with No. 12 longitudinal wires 4 inches on center, and No. 14 transverse wires 8 inches on center.

After the reinforcing has been placed over the Sheetrock or Weatherwood permanent forms, Pyrofill is poured and screeded to the proper thickness, making the total depth of slab 2½ or 3 inches including the thickness of the form.

Pyrofill consists of gypsum stucco, water, and 12½ pounds of fiber to 87½ pounds of calcined gypsum. Pyrofill weighs only 50 pounds per cubic foot.

Curbs, end walls, etc., are usually constructed of Precast-Gypsum Tile. Curbs may also be made of Sheetrock-Pyrofill or Weatherwood-Pyrofill construction, if poured in place instead of precast is desired.

OUTSTANDING ADVANTAGES

ADAPTABILITY—Whenever steel framing is used (whether the roof be flat, 45° pitched, monitor, sawtooth, Pond, Aiken, etc.), the inherent value of either Sheetrock-Pyrofill or Weatherwood-Pyrofill construction may be advantageously employed.

FIREPROOF—The inherent advantages of gypsum for fireproofing are universally recognized.

LIGHT WEIGHT—For standard slab thicknesses and sub-purlin sizes Sheetrock-Pyrofill and Weatherwood-Pyrofill construction weighs only 10 to 12½ lbs. per square foot (see table on next page.) This light weight, as compared with other masonry construction, permits savings throughout the structure, including columns and footings.

APPEARANCE—The smooth undersurface with uniform paneled effect is singularly pleasing to the eye. It also has excellent light reflection.

> **NOTE**—*If the underside of the slab is to be painted or otherwise decorated, such work should not be done until the waterproof roof covering has been applied and the slab is thoroughly dry.*

ECONOMICAL—The simplicity of the construction plus the light weight and the speed with which it is installed makes either Sheetrock-Pyrofill or Weatherwood-Pyrofill Roof Construction extremely economical.

NO MAINTENANCE—Calcined gypsum is chemically inert. Examinations of steel rods embedded for fifteen years in gypsum have shown no evidence of progressive corrosion. The maintenance cost is negligible.

HIGH INSULATION—Gypsum is among the highest in insulating value of the fireproof structural building materials. It is effective in protecting the building from extremes of outside temperature, both in summer and in winter.

The following table gives the heat loss through various types of roof construction expressed in B.t.u.'s per hour, per sq. ft., per degree difference in temperature. All values are figured with a 5-ply roof covering:

3	in. stone concrete	.61 B.t.u.'s
2½	in. Sheetrock-Pyrofill	.38 B.t.u.'s
3	in. Sheetrock-Pyrofill	.35 B.t.u.'s
2½	in. Weatherwood-Pyrofill (½ in. board)	.26 B.t.u.'s
3	in. Weatherwood-Pyrofill (1 in. board)	.19 B.t.u.'s

SPECIAL ADVANTAGE OF WEATHERWOOD-PYROFILL ROOF CONSTRUCTION—Weatherwood-Pyrofill Roof Construction has the special, additional, and unique advantage of providing an appreciable degree of acoustical absorption. This is particularly important in auditoriums, gymnasiums, and similar buildings but is also of considerable importance in many types of factories and industrial buildings.

*Reg. Trade-Mark.

Master Specifications

SHEETROCK-PYROFILL and WEATHERWOOD-PYROFILL ROOF CONSTRUCTIONS

NOTE—*Notes are explanatory or advisory only and should not be included in the specifications.*

(1) WORK INCLUDED

NOTE—*Here list the various roof areas to be constructed of Sheetrock-Pyrofill or Weatherwood-Pyrofill and specify the prescribed live load. If live loads vary, designate the live load applying to the various areas.*

(2) SUPPORTING STRUCTURAL STEEL WORK

All steel work for the support of the Sheetrock-Pyrofill Roof Construction has been designed not only to carry the prescribed live and dead loads, but to accommodate the most economical installation in accordance with the standard details of the United States Gypsum Company.

(3) MATERIALS

(3a) GENERAL—All Gypsum products shall be as manufactured by the United States Gypsum Company, 300 West Adams Street, Chicago, Ill.

(3b) SUB-PURLINS—Sub-purlins shall be steel **[tees] [rails]** of sizes and spacings required or indicated on the structural plans, furnished with a shop coat of paint. Provide all necessary clips **[of types best suited to conditions]** for rigidly securing sub-purlins to main purlins, etc.

(3c) SHEETROCK FORMS—Sheetrock (32 in. wide) shall be mill-made to exact lengths (maximum 10 ft.) to match the main purlin centering.

(3d) WEATHERWOOD FORMS—Weatherwood **[½ in.] [1 in.]** thick x 32 in. wide shall be mill-made to exact lengths (maximum 10 ft.) to match the main purlin centering.

(3e) REINFORCEMENT—Steel reinforcement shall be galvanized electrically-welded steel fabric made to USG specifications consisting of No. 12 main longitudinal wires 4 in. on centers and No. 14 transverse wires 8 in. on centers having an effective sectional area of .026 sq. in. per foot width of slab.

(3f) PYROFILL—Pyrofill shall consist of calcined gypsum and 12½ lb. of clean soft wood fiber to every 87½ lb. of gypsum. The gypsum and wood fiber shall be mill mixed. Water for proper consistency shall be added at the job.

(3g) PRECAST CURB TILE—Where so indicated on plans and details furnish 3-in. thick precast gypsum curb tile (reinforced when carrying a roof load or retaining drainage fill). For end wall construction where so indicated furnish Pyrobar Curb Tile (3-in. x 15-in. x 30-in. non-reinforced).

(3h) GYPSUM MORTAR—Gypsum mortar shall consist of one part of unfibered gypsum cement plaster and not to exceed two parts of clean sharp sand.

(4) ERECTION

(4a) GENERAL — All **[Sheetrock-Pyrofill] [Weatherwood-Pyrofill]** Roof Construction including all sub-purlins **[curbs] [end walls] [saddles] [drainage fill]** etc., shall be completely erected by the Engineering Sales Division of the United States Gypsum Company.

Roof construction shall be **(specify)** inches thick, including the thickness of the Sheetrock or Weatherwood. All joints in sub-purlins shall be staggered or rigidly tied together. Reinforcement shall be continuous. All roof surfaces shall be screeded smooth and true ready to receive the finished waterproof roof covering.

(4b) POURED CURBS—All curbs so indicated on plans and details shall be constructed of **(Sheetrock-Pyrofill) (Weatherwood-Pyrofill).**

(4c) TILE CURBS—All curbs so indicated on plans and details shall be constructed of precast gypsum curb tile (reinforced when carrying roof load or retaining drainage fill) set in gypsum mortar.

(4d) END WALLS, ETC.—Construct all **[end walls]** of **[monitors] [sawtooth skylights] ["A" frames] [specify]** of Pyrobar Curb Tile set in gypsum mortar.

(4e) DRAINAGE FILL—Provide Pyrofill saddles and drainage pitches to direct roof drainage to **[gutters] [drainage outlets].**

(5) WATERPROOF ROOF COVERING

NOTE—*Provide in the Roofing and Sheet Metal division of the specifications that the waterproof roof covering shall be applied as soon as possible after the Sheetrock-Pyrofill slab is erected (preferably within twenty days).*

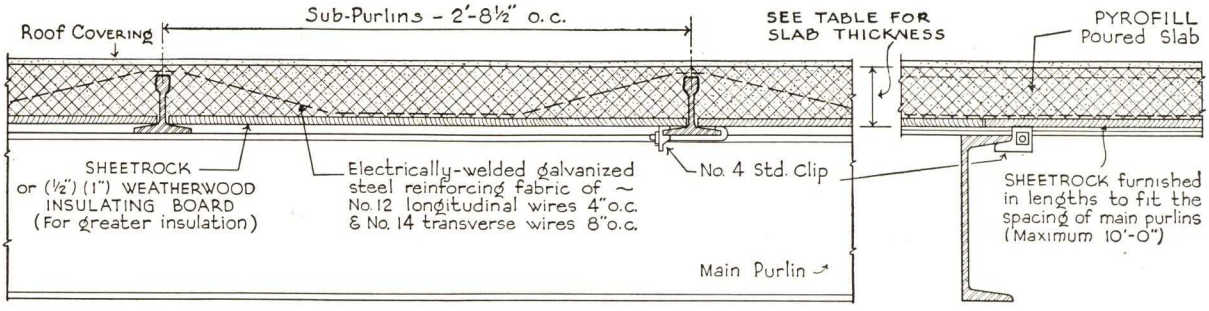
SUB-PURLIN SIZES AND WEIGHTS OF SLABS

Sub-Purlins Spaced 32½" Total Load — 45 Lbs. per Sq. Ft. M = 1/10 WL

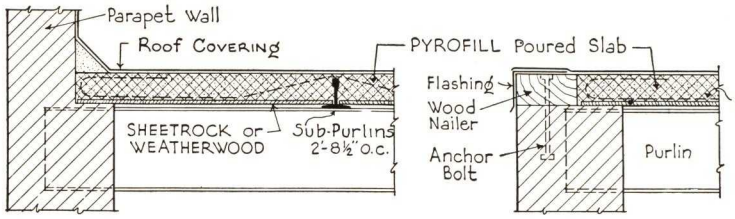
Size of Sub-Purlin (Weight per Yard)	Allowable Span		Weight of Sub-Purlins in lbs. per sq. ft. of Roof	Weight of Slab Including Sub-Purlins					
				Sheetrock Pyrofill		Weatherwood Pyrofill			
	18,000 lbs. per sq. in. Sub-Purlin Stress	20,000 lbs. per sq. in. Sub-Purlin Stress		Minimum Slab Thickness*	Weight in lbs. per sq. ft.	Min. Slab Thickness*		Wt. per sq. ft. in lbs.	
						½" Bd.	1" Bd.	½" Bd.	1" Bd.
USG 1-15/16"x1⅞" 8-Lb. Bulb Tee	6'-6"	6'-10"	1	2½"	11.5	2½"	3"	10.0	10.5
USG 2-7/16"x2⅜" 8.1-Lb. Bulb Tee	7'-4"	7'-9"	1	2¾"	12.5	2¾"	3"	11.0	10.5
12-Lb. Rail	8'-11"	9'-3"	1.5	2½"	12.0	2½"	3"	10.5	11.0
16-Lb. Rail	11'-2"	11'-6"	2	2½"	12.5	2½"	3"	11.0	11.5
20-Lb. Rail	13'-3"	13'-8"	2.5	3"	15.0	3"	3"	13.5	12.0

*Total Slab Thickness Including Sheetrock or Weatherwood . . . Minimum Thickness of Pyrofill 2".

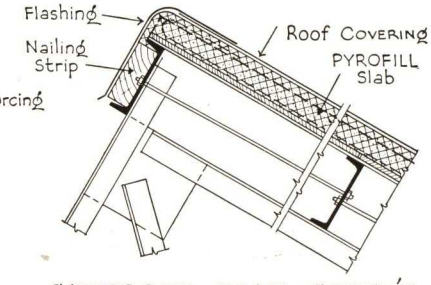
SHEETROCK-PYROFILL, WEATHERWOOD-PYROFILL DETAILS



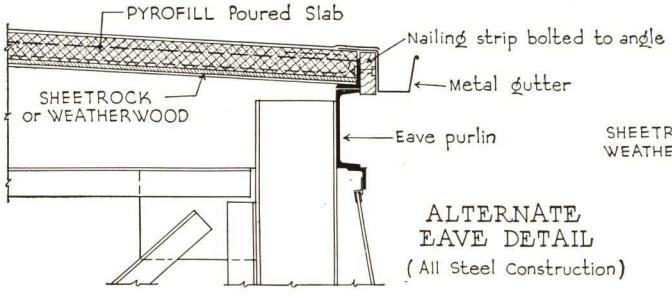
TYPICAL SHEETROCK OR WEATHERWOOD PYROFILL CONSTRUCTION



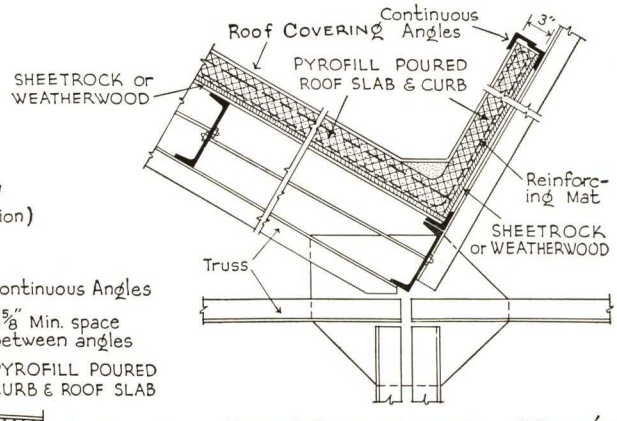
ALTERNATE DETAILS FOR ENDS OF BUILDING



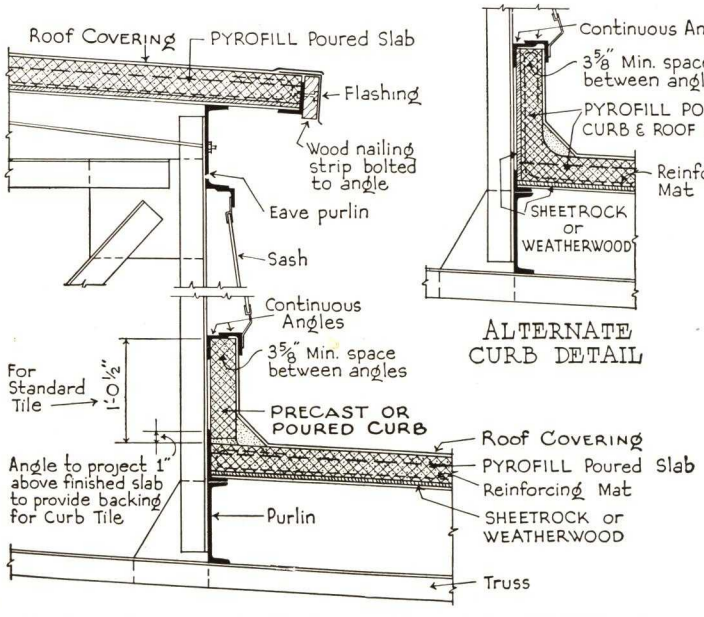
SAWTOOTH PEAK CONST'N.



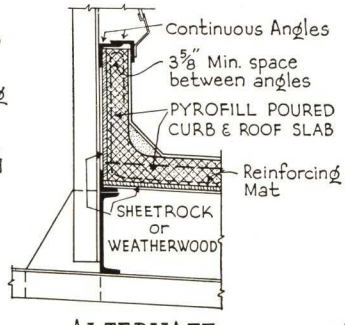
ALTERNATE EAVE DETAIL
(All Steel Construction)



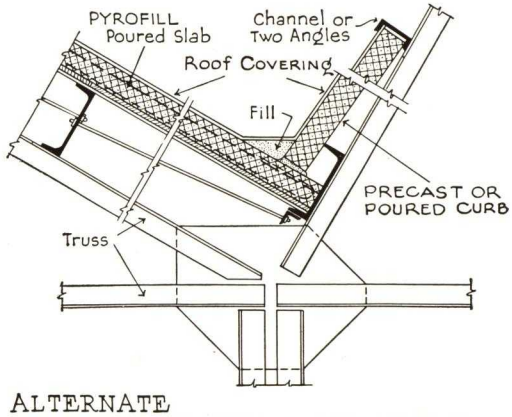
SAWTOOTH GUTTER CONST'N.



CURB & EAVE CONSTRUCTION FOR MONITOR



ALTERNATE CURB DETAIL



ALTERNATE SAWTOOTH GUTTER CONSTRUCTION

PYROBAR GYPSUM SHORT SPAN ROOF TILE

The United States Gypsum Company's Pyrobar* Gypsum Short Span Roof Tile System is a construction using pre-cast gypsum units, 30" long, supported by sub-purlins, which are in turn clipped or welded to the main roof purlins.

These pre-cast Pyrobar gypsum tile, made in relatively small units, are an ideal fireproof nailing deck for ornamental roof coverings. Such roofs usually involve steep pitches, hips, valleys, and dormers which require the flexibility of short span units. The Solid Tile have excellent nail-holding power. They are thus admirably suited to dormitories, schools, public buildings, memorial buildings, private residences and similar structures.

The Short Span gypsum units are exceptionally strong, provide good heat insulation and light reflection and therefore make an excellent type of roof construction for industrial buildings such as factories and warehouses.

This type of construction is particularly well suited for re-roofing work as it can be installed immediately behind the removal of the old deck with practically no interruption of plant operations or exposure of building contents to the weather.

DESCRIPTION—Pyrobar Gypsum Short Span Roof Tile are made in both solid and hollow units. The solid type tile are 3x12x30 inches. The hollow type are furnished in standard sizes of 3x12x30 inches and 4x12x30 inches.

All units except the 3" Hollow are reinforced with an electrically welded, galvanized steel mat so designed as to afford top and bottom reinforcing and so formed as to insure accurate location of the mat. The 3" Hollow tile are reinforced with two ⅜" cold rolled channels. In addition, there are two No. 8 wires mechanically secured to the channels at each end to serve as lateral-tie reinforcement which provide end anchorage for the channels. The channels are rigidly held in place by means of special devices on the moulds insuring accurate positioning of the reinforcing.

USES—The solid tile are ideal for the ornamental type of roof where a pre-cast, fireproof unit of great flexibility and good nail holding power is desired. The solid tile are also well adapted to industrial buildings, both for flat and for pitched roofs. Where lighter weight and greater insulation are desired, the hollow tile are suggested. The 4" hollow tile afford better heat insulation with some saving in weight, while the 3" hollow tile permit a further saving in weight and in cost. Hollow tile are only recommended for roofs where a built-up roof covering is to be used. They are satisfactory for the nailing required for the application of built-up roof covering, but hollow tile are not recommended as a nailing base for ornamental or slate roof covering.

SUB-PURLINS—USG engineers, recognizing the need for a more efficient and economical tee section, have developed the USG Bulb Tee Sections. These special, patented sections have greater strength and greater bearing surface for the tile than standard tees of equal sectional area and weight.

NAILING—Ordinary Built-up Roof covering is applied in accordance with standard practise.

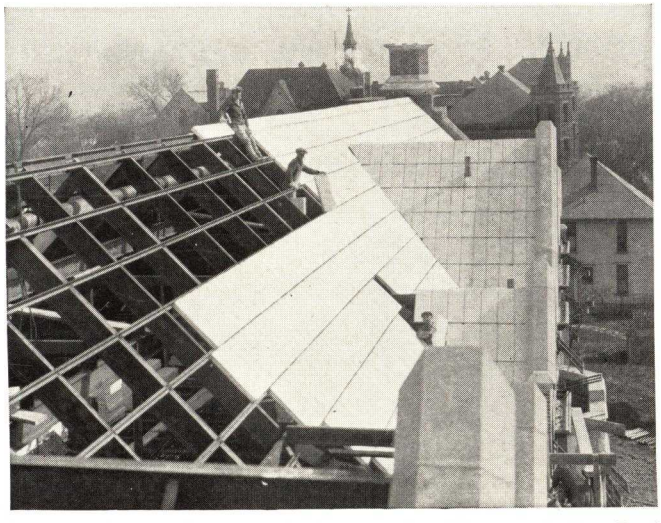
Where slate or ornamental tile roofings are to be nailed directly to the deck (3" solid tile), square-cut nails having not less than 2" penetration into the gypsum should be used. When heavy roofings are to be applied on very steep slopes, they should be fastened by bolting through the slab or nailed to wood grounds which are, in turn, secured directly to the roof deck. Because of the great expansion of sheet metal, this type of roofing requires thoroughly rigid fastening and the metal cleats used for such purpose should be spaced not over 8" on centers and secured with two nails each.

HEAT INSULATION—Gypsum is among the highest in insulating value of the fireproof structural building materials. The under-surface of the gypsum roof remains at practically the same temperature as the interior of the building, regardless of outside temperature. This naturally means a saving in fuel bills, and makes possible very uniform room temperatures and better working conditions both summer and winter.

The table below contrasts the B.T.U. loss per hour, per square foot, per degree difference in temperature of several types of decks:

Corrugated Sheet Iron	1.50
Cement Tile 1⅝" thick	.68
Stone Concrete 3" thick	.61
Pine Plank 2" thick	.34
Pyrobar Short Span Tile 3" solid	.43
Pyrobar Short Span Tile 3" hollow	.39
Pyrobar Short Span Tile 4" hollow	.35

MAINTENANCE—Since gypsum is inert and no progressive corrosion of the reinforcement takes place, the maintenance cost is practically nothing.



Erecting Pyrobar Gypsum Short Span Root Tile on Sloping Roof

Erecting Pyrobar Gypsum Short Span Roof Tile on Flat Roof

OUTSTANDING ADVANTAGES

ADAPTABILITY—Pyrobar Short Span Roof Tile supported on tee sub-purlins is by far the most flexible precast roof construction. It is easily cut and fitted at hips, valleys, dormers, and openings which is very important for many roofs. It can be used with economy on any type of factory or industrial building, power plant, school, etc. The solid tile is a nailing base.

FIREPROOF—Gypsum is absolutely incombustible and the inherent advantages of gypsum for fire-proofing are universally recognized.

LIGHT WEIGHT—The weight of the tile plus the USG Bulb Tee is only about 18 lbs. per square foot (less than half the weight of 3 inches of stone concrete), permitting structural steel savings.

APPEARANCE—The interior appearance of the tile is neat and the undersurface is an excellent light reflector.

ECONOMICAL—Pyrobar Roof Tile are low in cost and permanent. The large light weight units are easily and speedily erected in any weather in which it is possible to work.

The Pyrobar tile are laid directly on the supporting steel work and require only the grouting of joints to make the roof ready for the waterproof covering. Waterproofing follows immediately, protecting the interior, and thus making possible early occupancy.

Master Specifications

PYROBAR GYPSUM SHORT SPAN ROOF TILE

(1) WORK INCLUDED

NOTE—*Here list the various roof areas to be constructed of Pyrobar Precast Roof Tile and specify the prescribed live load. If more than one type of tile is used, list separately the areas constructed of each.*

(2) MATERIALS

(2a) SHORT SPAN TILE—Where so designated, the roof slab shall be constructed of Pyrobar Short Span Roof Tile **[3 x 12 x 30 in. Solid] [3 x 12 x 30 in. Hollow] [4 x 12 x 30 in. Hollow]** accurately laid, without mortar, upon the supporting steel with full bearing and with tile units laid tight. All joints on top surface shall be filled with gypsum mortar and the roof left smooth and true, ready for the application of the waterproof roof covering.

(2b) SPECIAL UNITED STATES GYPSUM BULB TEE SUB-PURLINS—All sub-purlins shall be special United States Gypsum Bulb Tees, with a shop coat of light gray paint.

(2c) CURB TILE, END WALLS, ETC.—Where so indicated on the plans, curbs and end walls shall be constructed with 3 in. Solid Pyrobar Curb Tile set in gypsum mortar.

(2d) GYPSUM MORTAR—Gypsum mortar shall consist of one part of unfibered gypsum cement plaster and not to exceed two parts of clean, sharp sand. Mix to the proper consistency in a clean mortar box with clean water.

(2e) SADDLES AND DRAINAGE FILL—Saddles and Drainage Fill shall be constructed of Pyrofill (Gypsum Fiber Concrete) consisting of calcined gypsum and 12½ lbs. of clean soft wood fiber to 87½ lbs. of gypsum and sufficient clean water for proper consistency.

(3) ERECTION

(3a) BY UNITED STATES GYPSUM COMPANY—All Pyrobar Precast Roof Tile Construction shall be completely erected by the Engineering Sales Division of the United States Gypsum Company or one of its authorized erectors.

(4) WATERPROOF ROOF COVERING

NOTE—*Provide in the Roofing and Sheet Metal division of the specifications that the waterproof roof covering shall be applied as soon as possible after the gypsum roof slab is erected (preferably within twenty days).*

NOTE—*For application of ornamental roofing, such as slate, tile, and metal, see recommendations given on Page 4 under "Nailing".*

TEE SIZES AND ALLOWABLE SPANS

Based on 50 Lbs per Sq. Ft. Total Roof Load

Tees Spaced 2'-6¾" C. to C. M = 1/10 WL

Size of Tee	Allowable Span		Wt. of Tees Lbs. per Sq. Ft. of Roof
	18,000 lbs. Per Sq. In. Stress	20,000 lbs. Per Sq. In. Stress	
USG 1-15/16"x1⅞" 2.65 LB. BULB TEE	6'-4"	6'9"	1.04
USG 2-7/16"x2⅜" 2.7 LB. BULB TEE	7'-2"	7'7"	1.05
2½"x2½" 5.5 LBS.	7'-8"	8'-1"	2.15
2½"x3" 6.1 LBS.	9'-2"	9'-8"	2.4
3"x3" 6.7 LBS.	9'-4"	9'-10"	2.61

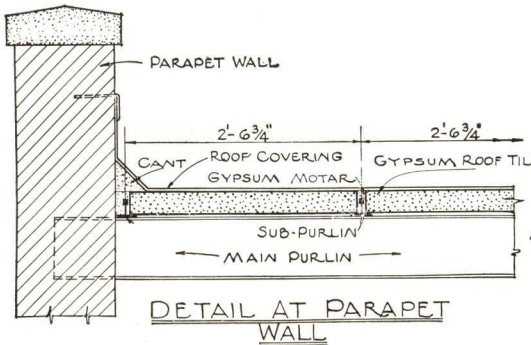
Sizes and Weights of Pyrobar Gypsum Short-Span Roof Tile

3"x12"x30" Solid Tile Wt. 17 Lbs. per Sq. Ft.
3"x12"x30". Hollow Tile Wt. 12½ Lbs. per Sq. Ft.
4"x12"x30" Hollow Tile Wt. 15 Lbs. per Sq. Ft.

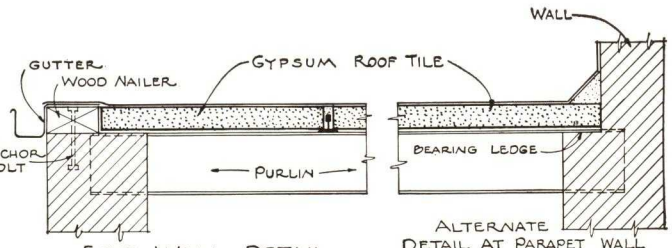
NOTE: Add Weight of Tees to Weight of Tile to Secure Weight of Roof Deck.

*Reg. Trade-Mark.

DETAILS OF PYROBAR GYPSUM SHORT SPAN ROOF TILE

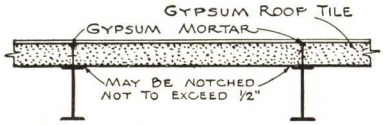


DETAIL AT PARAPET WALL

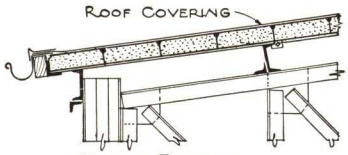


EAVE WALL DETAIL

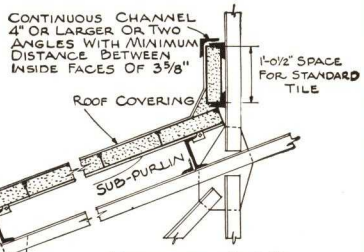
ALTERNATE DETAIL AT PARAPET WALL



DETAIL SHOWING USE OF LIGHT JOISTS IN PLACE OF SUB-PURLINS

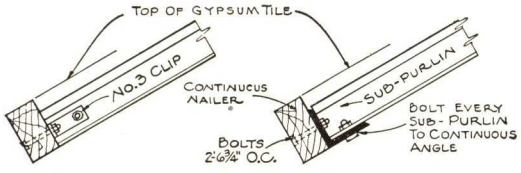


EAVE DETAIL

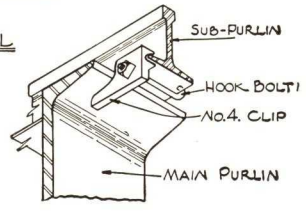


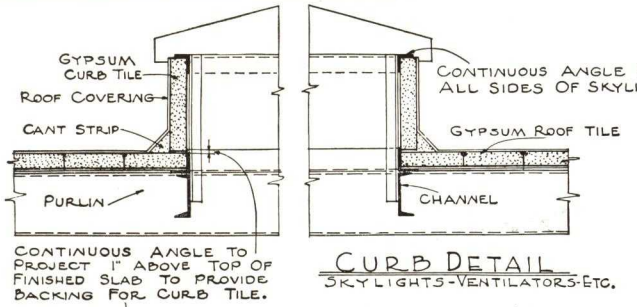
MONITOR CURB DETAIL

EAVE DETAIL

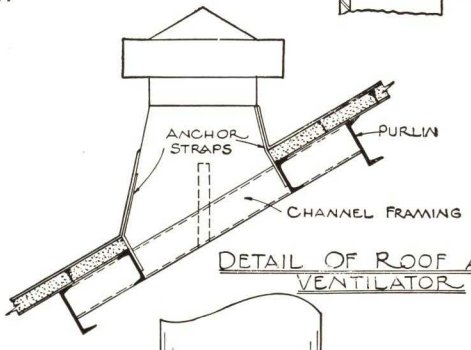


EAVE CONSTRUCTION DETAILS

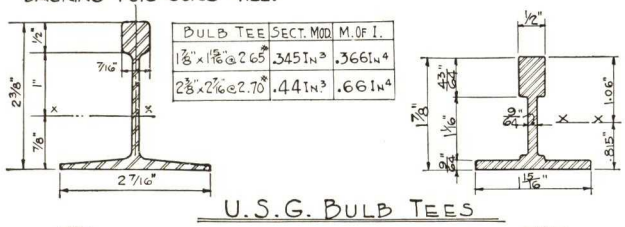




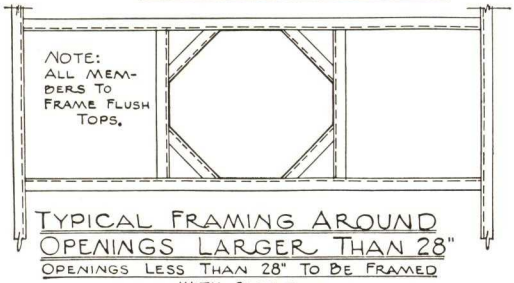
CURB DETAIL
SKYLIGHTS-VENTILATORS-ETC.



DETAIL OF ROOF AT VENTILATOR

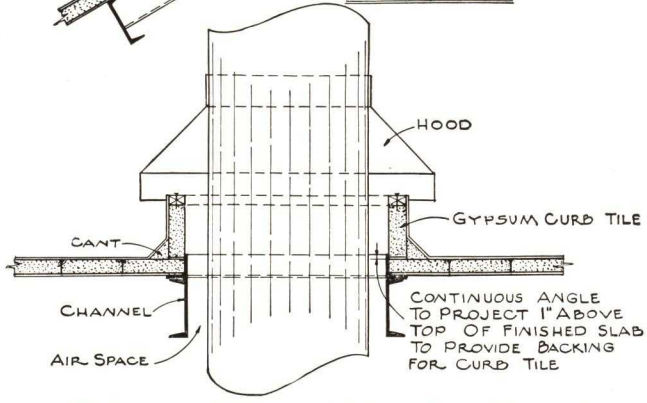


U.S.G. BULB TEES



TYPICAL FRAMING AROUND OPENINGS LARGER THAN 28"

OPENINGS LESS THAN 28" TO BE FRAMED WITH BULB TEES



TYPICAL DETAIL AROUND OPENINGS EXTENDING THROUGH ROOF

United States Gypsum Company

TONGUE AND GROOVE GYPSUM ROOF and FLOOR TILE

To provide a light weight, incombustible and economical construction for roofs and floors in connection with steel framing the United States Gypsum Company furnishes a complete line of Tongue and Groove Gypsum Roof and Floor Tile. Ease of erection is a feature of the entire line.

All types of this line are so constructed and so reinforced that the ends need not come directly over supports but may extend into the next panel. The design enables the tile to cantilever so any spacing of supports, within the limits for each type, may be used.

TYPES

2½" x 10" x 6'-0" (EMBEDDED REINFORCING) TONGUE AND GROOVE GYPSUM ROOF AND FLOOR TILE—Cast in steel moulds with electrically welded galvanized steel reinforcing completely embedded in the gypsum mass. Tongue and groove joints are provided on all four edges.

For floor construction with supports spaced not over 30 inches on centers these tile will safely support a load of 150 pounds per square foot. For roof construction with supports spaced not over 48 inches these tile will safely support a load of 50 pounds per square foot. The weight is only 15 pounds per square foot.

3" x 12" x 10'-0" CHANNEL SECTION (EMBEDDED REINFORCING) TONGUE AND GROOVE GYPSUM ROOF AND FLOOR TILE—Reinforced with two channels, 2 inches deep, made into a frame with ¾ inch channel ties and with additional electrically welded galvanized steel fabric which also provides reinforcement in the tongue and groove edges. The tongue and groove on all four edges provides an interlock which develops continuity of the units.

Load and deflection tests conducted by Columbia University of New York City showed that the following superimposed working loads are very conservative:

Construction	Span	Load
Floors	Up to 5'-0"	150 lbs. per sq. ft.
Roof	Up to 7'-0"	75 lbs. per sq. ft.

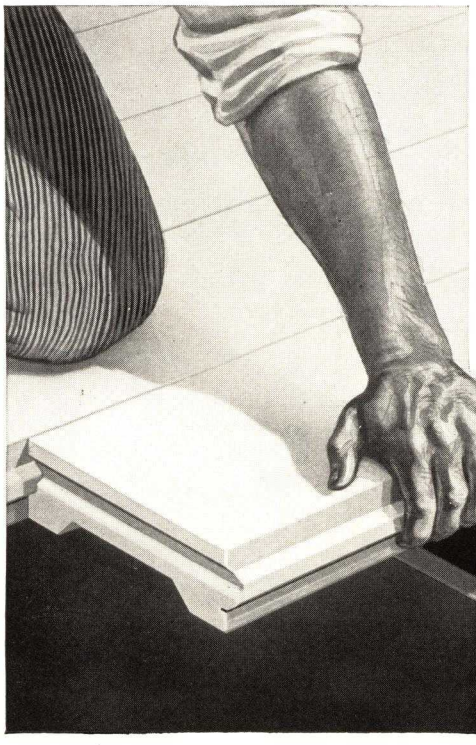
USG STEEL BOUND GYPSUM TONGUE AND GROOVE TILE—Made in two sizes and types. The Medium Span tile is 2" x 15" x 8'-0" designed for roofs on spans up to 4 feet and for floors on spans up to 3 feet. The Long Span tile is 2" x 12" x 10'-0" and is designed for roofs on spans up to 7 feet and for floors on spans up to 5 feet. See load table.

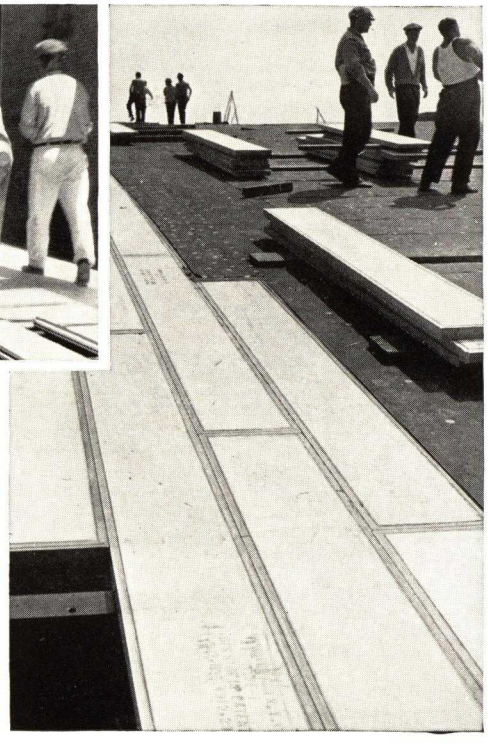
All tile are mill moulded and have steel tongue and groove edging on sides and ends, firmly anchored into the gypsum. In addition they are manufactured with an electrically welded galvanized steel fabric as reinforcement for the gypsum.

Load and deflection tests conducted by nationally recognized testing laboratories showed that the following superimposed working loads are very conservative:

LONG SPAN STEEL BOUND GYPSUM TILE—2" x 15" x 10'-0"		
Construction	**Span**	**Conservative Loads**
Floors	Up to 5'-0"	150 lbs. per sq. ft.
Roofs	Up to 7'-0"	75 lbs. per sq. ft.
MEDIUM SPAN STEEL BOUND GYPSUM TILE—2" x 15" x 8'-0"		
Floors	Up to 3'-0"	150 lbs. per sq. ft.
Roofs	Up to 4'-0"	75 lbs. per sq. ft.

The weight of both types is 12 pounds per square foot.





Above: USG 2½ in. T&G Roof and Floor Tile are quickly and easily erected

Left: USG 3 in. Channel Section T & G Roof and Floor Tile

Right: Installing USG Steel Bound Gypsum T & G Tile on airdrome, North Beach, Long Island, N. Y.

OUTSTANDING ADVANTAGES

ECONOMICAL—Low first cost plus low erection cost makes any of these USG T&G Gypsum Tile unusually economical. In addition their light weight permits economies in steel design that are reflected throughout the structure.

FIREPROOF—Gypsum will not support combustion at any known temperature.

LIGHT WEIGHT—Gypsum is one of the lightest of the structural building materials, weighing only about forty per cent as much as concrete. Light weight is combined with structural strength in USG Tongue and Groove Gypsum Tile.

APPEARANCE—The undersurface presents a neat, clean appearance with high light reflection.

EASE OF ERECTION—The large units are laid directly on the supporting steel and anchored in place with galvanized clips fastened into the sides of the tile and engaging the top flanges of the steel supports. End joints of the tile are staggered, coming where they may either on or between the steel supports. Fractional length units should be used for starting alternate courses to break joints. Full length units can be cut where necessary without appreciable waste.

ANY ROOF COVERING—Ordinary Built-Up Roof Covering is applied according to standard practice.

Where light slate or other light ornamental tile roofings are to be nailed to the deck, square cut nails having 1½ in. penetration into the gypsum should be used.

Where the slope is greater than 45 degrees or when heavy roofings are to be applied, they should be fastened by bolting through the slab or nailed to wood grounds which are in turn secured directly to the roof deck, by the nailing or bolting.

ANY FLOOR FINISH—Tile may be made ready for linoleum or composition floor covering by the application of a ¼ in. thick coating of United States Gypsum Company's PYROTOP—a prepared underlayment requiring the addition of water only and trowelled in place.

Master Specifications

TONGUE and GROOVE GYPSUM ROOF and FLOOR TILE

The **(roof) (and) (floors)** shall consist of USG **(2½" x 10" x 6'-0") (3" x 12" x 10'-0" Channel Section) (Long Span 2" x 15" x 10'-0" Steel Bound) (Medium Span 2" x 15" x 8'0" Steel Bound)** Tongue and Groove Gypsum Tile as manufactured by the United States Gypsum Company.

All tile shall be set on the supporting steel with close joints and with end joints staggered in adjacent rows starting with alternate full and fractional length tile. Each tile shall be anchored to the supporting steel at every point of support with clips alternating on opposite sides of beam flanges. The tile shall be cut to fit around all openings and wherever required to fit the steel frame.

NOTE—*Insert in the steel specifications that proper framing to support the tile shall be provided around all openings wider than ten inches and that the tops of joists shall be set level and true to support the tile firmly.*

• • •

PYROBAR GYPSUM PARTITION and FURRING TILE

DESCRIPTION

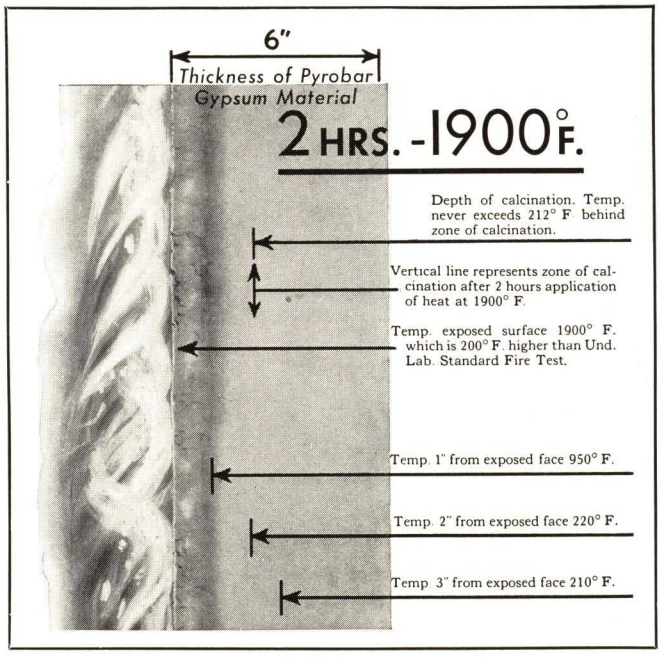
Pyrobar tile are for use in buildings of all types and classes. They are used to form fireproof interior non-bearing partitions, for furring, for elevator and stairway enclosures, for fireproof enclosures around pipe chases, ducts, shafts, etc., and for fireproofing structural steel columns, beams and girders.

Pyrobar tile are uniform in size, and are of uniform strength and density. They are accurately moulded, by a continuous automatic machine process, into units that are 12 inches high and 30 inches long. Furring tile are made 1½ and 2 inches thick; partition tile are made solid, 2 and 3 inches thick, and hollow, 3, 4, 5, and 6 inches thick. Smooth face tile are made for use where the furring and partitions are to remain unplastered.

Pyrobar tile meets fully the standard specifications for Gypsum Partition tile or block of the American Society for Testing Materials.

RESULTS OF TESTS

Results of fire tests made by Underwriters' Laboratories on gypsum tile are shown in the illustration at right, above. The tile were subjected to a constant temperature of 1900° F. for two hours. At the end of that time, the temperature of the tile, 2 inches away from the flame, was but 220° F. The critical temperature at which steel begins to lose its strength is 600° F.



OUTSTANDING ADVANTAGES

Fireproof—Pyrobar Gypsum Tile are absolutely incombustible.
Light Weight—Less weight than other commonly used materials.
Confines Fire—Demonstrated by illustration on previous page.
Ideal Plaster Base—Gypsum tile bonds with gypsum plaster.
Cheaply Erected—Light, 2½ sq. ft. units are easy to handle.
Plaster Savings—Straight, uniform tile assure even, true wall.
Economical—No waste in cutting; breakage is almost negligible.
Alterations—Alterations easily made with no waste or mess.

SIZES AND WEIGHTS OF PYROBAR PARTITION AND FURRING TILE

Size of Pyrobar, Gypsum Tile, In.	Recommended heights for each size	Weight tile per sq. ft., lb.	Weight mortar per sq. ft., lb.	Weight plaster, one side, per sq. ft., lb. ½ in. grounds	Total weight plastered, one side, per sq. ft., lb.	Weight plaster two sides per sq. ft., lb.	Total weight plastered, two sides, per sq. ft., lb.	Approx. mortar requirements per 1000 sq. ft.	
								Pounds Set Fast Cement	Cubic yards sand
1½-in. Split...1½ x 12 x 30	Furring†	4.9	1.4	3	7.9			500	0.625
2-in. Split.....2 x 12 x 30	Furring†	6.4	1.4	3	9.4			600	0.75
2-in. Solid.....2 x 12 x 30	10 feet*	10.0	1.5	3	13.0	6	16.0	600	0.75
3-in. Hollow.....3 x 12 x 30	13 feet*	10.0	2.0	3	13.0	6	16.0	800	1.00
3-in. Solid.....3 x 12 x 30	15 feet†	13.0	2.0	3	16.0	6	19.0	800	1.00
4-in. Hollow.....4 x 12 x 30	17 feet*	13.0	2.5	3	16.0	6	19.0	900	1.125
5-in. Hollow.....5 x 12 x 30	20 feet*	17.2	2.75	3	20.2	6	23.2	1000	1.25
6-in. Hollow.....6 x 12 x 30	30 feet*	19.0	3.0	3	22.0	6	25.0	1100	1.40

*Underwriters' Laboratories recommendations. †No Underwriters' recommendation.

Master Specifications

PYROBAR GYPSUM PARTITION and FURRING TILE

(1) WORK INCLUDED

All interior non-bearing partitions, exterior wall furring and column covering shall be built of Precast Pyrobar Gypsum Partition Tile of the thickness indicated on the plans.

(2) WORK BY OTHERS

(2a) All reinforcing bars for reinforced lintels will be furnished by others. **(2b)** All rough bucks for openings will be provided and accurately set by others. **(2c)** All wood nailing blocks to receive grounds, etc., will be provided and attached by others.

(3) MATERIALS

(3a) MORTAR—Mortar shall consist of one part United States Gypsum Company's Setfast Cement to three parts by weight of clean, sharp, dry sand. (Do not use Portland Cement or lime mortar.) No mortar shall be retempered.

(4) ERECTION

(4a) LAYING—All partitions, furring and column covering shall be started on the fireproof floor and shall be set plumb, straight and true with vertical joints broken, and shall be wedged at the ceiling and slushed with mortar. The corners shall be built log cabin fashion, the tile interlocking. All tile shall be laid with full flush joints to a line, with horizontal beds uniformly level on each course. All joints, chinks and crevices between the tile and other work shall be filled with mortar well slushed in.

(4b) PARTITIONS—All partitions coming in contact with existing walls shall be anchored by driving spikes into the walls in the joints of each course.

(4c) BUCK ANCHORS—Door bucks shall be anchored to the partitions by driving 10d cut nails into them in the joints of each course of tile or secured by any approved clip.

(4d) FURRING—Furring tile shall be laid up against the wall and securely anchored to the wall every square yard with 10d cut nails, metal ties, anchor straps or other approved fasteners left in place by the exterior masonry contractor.

(4e) LINTELS—Openings not greater than 22 inches wide shall be spanned with a single tile. Openings over 22 inches but not more than 4 feet shall be spanned by tile laid in the form of a jack arch. Openings over 4 feet but not more than 6 feet shall be spanned by reinforced gypsum lintels. Openings over 6 feet shall be spanned by steel lintels of approved design. All lintels must have at least 4 inch bearing at each end on the tile beneath.

NOTE—*Door bucks shall be made of 2 inch lumber of the same width as the thickness of the partition and to the edges shall be secured ½ in. x 2¾ in. plaster grounds forming a rabbet to receive the tile.*

NOTE—*Trim shall be secured to grounds or to nailing blocks set in the tile construction. Nailing blocks shall be not less than ⅞ in. thick and securely nailed to the ends of the tile before the tile is set in the wall. Blackboards, toilet and heavy fixtures shall be secured by bolting through the tile construction or shall be nailed to nailing blocks not less than 1½ in. thick and spaced not over 15 inches on centers.*

PYROBAR BEAM and GIRDER FIREPROOFING

WHY USE FIREPROOFING?—At no point in the building structure is maximum fire protection of such vital importance as around structural steel members, for should those members fail the whole building structure would collapse.

If fire occurs the temperature of the structural steel should be held below 1000° F.—the temperature at which steel begins to lose its strength rapidly.

WHY USE PYROBAR FIREPROOFING?—Nature has endowed gypsum with qualities which make it the ideal material for fireproofing purposes. It has been said that gypsum provides its own sprinkler system. That is literally true. The chemically combined water of crystallization remains in the gypsum throughout the years ready to repel fire whenever it attacks. Tests have shown that it is impossible for Pyrobar-protected steel to reach a higher temperature than 212° F. until the Pyrobar has completely calcined; just as it would be impossible to feel the heat of a blow torch through a piece of ice until after the ice had melted.

Calcination of and high heat transfer through Pyrobar requires hours even under severe fire conditions. In an Underwriters Laboratories test on 3-in. hollow Pyrobar gypsum partition tile a two hour exposure to 1900° F. failed to raise the temperature of the unexposed side of the wall over 90° above the room temperature.

Pyrobar will not spall under fire, for it can expand only through 142° (from 70° room temperature to 212°) even when exposed to the extremely high temperatures frequently reached in building fires. Many building failures have been caused by the spalling of the fireproofing, thus leaving the steel exposed to temperatures at which its strength was not sufficient to support the loads.

OTHER PYROBAR ADVANTAGES—In addition to fire protective advantages, Pyrobar Steel Fireproofing has these further qualities:

1. Light weight—enables steel savings.
2. Easy to cut and fit—meets the wide variety of conditions which construction imposes.
3. Good plaster base—gypsum bonds with gypsum. Pyrobar is an ideal base for gypsum plaster.
4. Good appearance unplastered—cast in steel moulds Pyrobar units are straight and true. Note the clean cut, uniform, white appearance in job photographs.
5. Shapes for every kind of framing—No matter what your problem there is a type of Pyrobar to fit your needs exactly.

PYROBAR TYPES AND USES—Pyrobar Gypsum Shoe Tile are made for beams having flange widths up to 9 in. and are the most economical type where small steel beams are used.

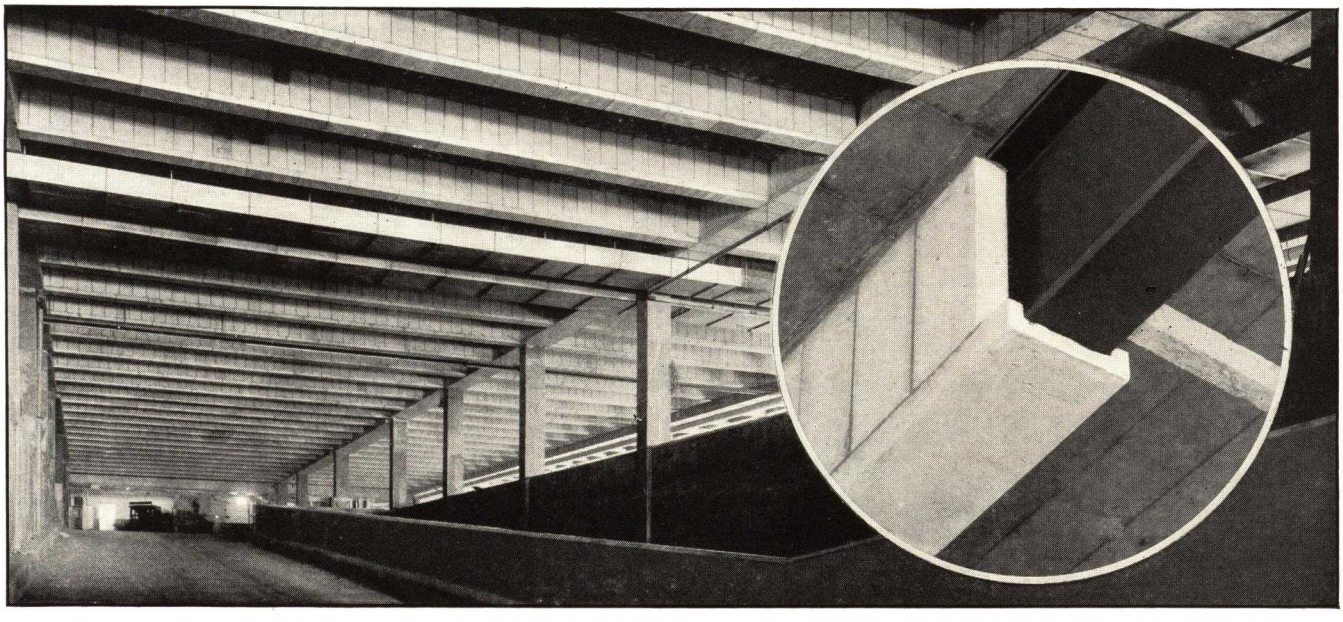
Pyrobar Gypsum Strap Type Soffit Tile can be used for beam flanges wider than 9 in.

Pyrobar Gypsum Soffit Tile are adapted to flange widths from 3 to 17½ in., to built-up girder sections, and are particularly desirable from the standpoint of appearance where the fireproofing is not to be plastered.

Pyrobar Gypsum Angle Tile are for very large built-up steel sections. Standard hollow Pyrobar gypsum partition tile is cut to size on the job and suspended by clips on the bottom of such sections.

In conjunction with any of the above flanges shapes, Pyrobar Gypsum Partition Tile is used to cover the beam sides. The assembled constructions all provide a minimum of 2 in. of protection to the steel, which fulfills the requirements of the National Board of Fire Underwriters.

ANOTHER TEST REPORT—The Bureau of Standards' report (Technological Paper No. 130) says: "This table shows that the length of time required for a temperature of 600° C. (1112° F.) to be attained at a depth of 1½ in. does not vary greatly in the clay and concrete specimens. The gypsums are seen to be distinctly better than clay and concrete in this respect, only one of them (out of 28 total specimens) reaching a temperature of 600° C. at a depth of 1½ in. in the three and one-half hour test. Obviously, the gypsum specimens indicate distinctly superior thermal protection for embedded steel."



Pyrobar Beam and Girder Fireproofing Used in New Chicago Post Office—Graham, Anderson, Probst and White, Architects

United States Gypsum Company

Master Specifications

PYROBAR BEAM AND GIRDER FIREPROOFING

NOTE—*Notes are explanatory or advisory only and should not be included in the specifications.*

(1) WORK INCLUDED

All steel **(columns) (beams) (girders) (trusses)** shall be protected with precast Pyrobar gypsum fireproofing.

NOTE—*List and locate any special requirements not clearly indicated on plans and details. Note exceptions, if any.*

(2) MATERIALS

(2a) FIREPROOFING—For all beams shall consist of Pyrobar Gypsum Tile of the proper shapes and sizes for covering the bottom flanges. Covering of beam sides and covering for columns shall be cut to size on the job from standard **(2-in. solid) (3-in. hollow)** Pyrobar Gypsum Partition Tile. All gypsum fireproofing materials shall be as manufactured by the United States Gypsum Company. All steel shall be protected with a minimum of 2 in. of precast Pyrobar.

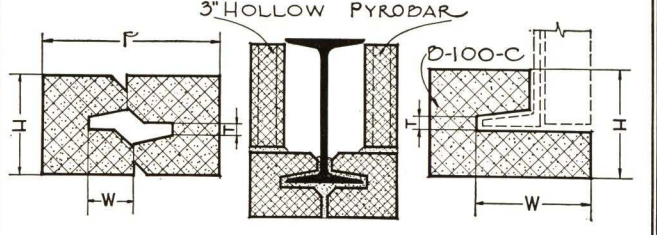
(2b) MORTAR—Shall be mixed in a clean mortar box in the proportions of one part gypsum cement to three parts sand, by weight, and sufficient water to bring to the right consistency.

NOTE—*Do not use Portland cement or lime.*

(3) ERECTION

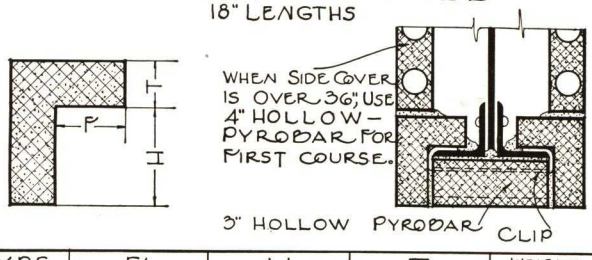
All fireproofing shall be erected in strict accordance with the United States Gypsum Company's standard details. All units shall be laid in gypsum mortar with full flush joints, true to line and plumb.

• PYROBAR SHOE TILE •
• 18" LENGTHS •



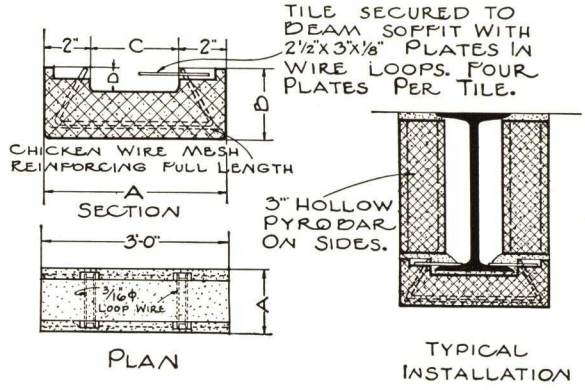
TYPE	MAX. WIDTH OF FLANGE	F	H	T	W	WEIGHT PER LIN. FT.
D-40	5"	7⅝"	4¼"	½"	2"	12.5 LBS.
D-50	6"	8¼"	4¼"	⅝"	2½"	13 "
D-65	7½"	9¾"	4¼"	13/16"	3¼"	15 "
D-80	9"	10½"	4¼"	15/16"	4"	16 "
D-100-C CHANNELS			4½"	½"	4⅞"	10 "

• PYROBAR ANGLE TILE •
18" LENGTHS



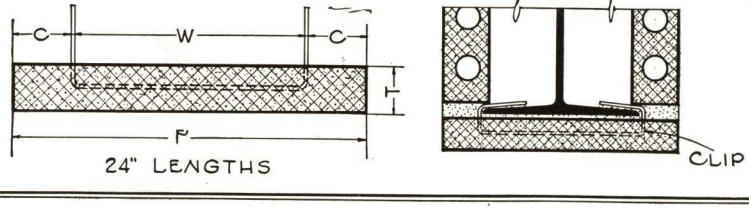
TYPE	F	H	T	WEIGHT PER LIN. FT.
L-34	3"	4"	2"	15 LBS.
L-45	4"	5"	2"	18.5 "
L-46	4"	6"	2"	20 "

• PYROBAR SOFFIT TILE •



TYPE	A	B	C	D	WEIGHT PER LIN. FT.	MAX. WIDTH OF FLANGE
D-30-S	7¼"	3"	3¼"	1"	8 LBS.	3"
D-40-S	8¼"	3¼"	4¼"	1¼"	9 "	4"
D-50-S	9¼"	3¼"	5¼"	1¼"	10 "	5"
D-60-S	10¼"	3¼"	6¼"	1¼"	11 "	6"
D-70-S	11¼"	3½"	7¼"	1½"	12 "	7"
D-80-S	12¼"	3½"	8¼"	1½"	13 "	8"
D-90-S	13¼"	3½"	9¼"	1½"	14 "	9"
D-100-S	14¼"	3¾"	10¼"	1¾"	15 "	10"
D-115-S	15¾"	3¾"	11¾"	1¾"	16 "	11½"
D-130-S	17¼"	3¾"	13¼"	1¾"	17½"	13"
D-145-S	18¾"	4"	14¾"	2 "	19 "	14½"
D-160-S	20¼"	4"	16¼"	2 "	20½"	16"
D-175-S	21¾"	4"	17¾"	2 "	22 "	17½"

• PYROBAR STRAP TYPE SOFFIT TILE •



TYPE	F	C	T	W	WEIGHT PER LIN. FT.
S-10	15¼"	2½"	2"	10"	13 LBS.
S-11	15¼"	2"	2"	11"	13 "
S-12	17¼"	2½"	2"	12"	14.5 "
S-13	17¼"	2"	2"	13"	14.5 "
S-14	19¼"	2½"	2"	14"	16 "
S-15	19¼"	2"	2"	15"	16 "

USG STEEL ROOF DECK

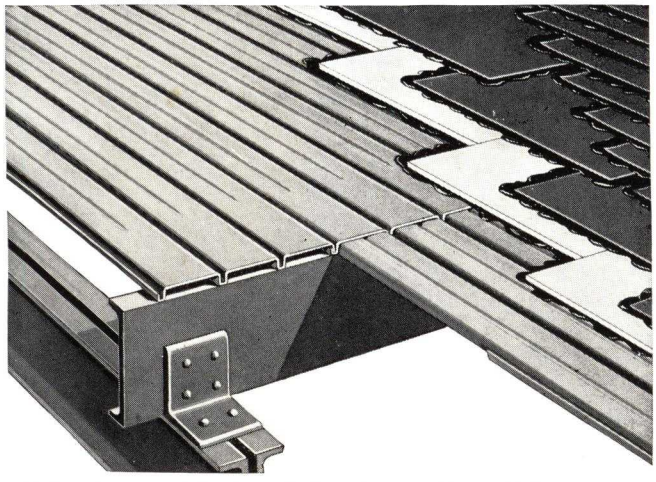
GENERAL—

Deck Plates—USG deck plates are rolled from copper-bearing steel. Mill painted in gray. Other materials on special order. USG Deck Plates are 18 in. wide with 1½ in. deep reinforcing ribs, 6 in. on centers. Stiffening beads are formed midway between the ribs. Decks plates are interlocking and end-lapping type, clipped together when erected, forming an integral surface for the application of insulation and roofing materials.

Clips—Two standard types. One for fastening the deck plates to the purlins and the other for locking the plates together between the purlins.

INSULATION—The accompanying table gives the heat transmission expressed in B.t.u. per hour per sq. ft. per degree difference in temperature. Five-ply roofing is included.

Deck without insulation..... .95 B.t.u.'s
Deck with ½-in. insulation..... .39 B.t.u.'s
Deck with 1 -in. insulation..... .25 B.t.u.'s
Deck with 1½-in. insulation..... .18 B.t.u.'s



Above: Details of USG Steel Roof Deck. At Right: Dimensional Cross-Section of USG Steel Roof Deck

ADAPTABILITY—USG Steel Roof Decks are adaptable for all steel frame structures, fitting any purlin spacing.

ENGINEERING DATA—The allowable safe loads given in the table below are based on actual tests on bare plates. Application of insulation gives additional rigidity to the deck.

ALLOWABLE SAFE LIVE LOADS—POUNDS PER SQ. FT.

U.S.S. Ga.	Clear Span									
	4'0"	4'6"	5'0"	5'6"	6'0"	6'6"	7'0"	7'6"	8'0"	8'6"
22	83	66	53	44	37					
20			81	67	56	48	41			
18					71	60	52	45	39	35

Factor of safety for 22 and 20 Gauge—4.
Factor of safety for 18 Gauge—3.5.

Weight of 20 gauge deck is 2.4 lbs. per sq. ft.; 18 gauge weighs 3.2 lbs. Total dead load, including insulation and roofing material, is approximately 5 lbs. per sq. ft.

ADVANTAGES—

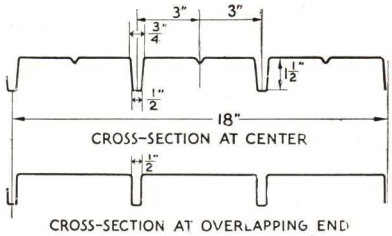
Long Life—The use of copper-bearing steel and insulation assures long life and low maintenance.

Economy—Cost is low for an incombustible roof deck.

(1) Structural Steel Savings result from light weight of roof unit.

(2) Fuel Costs are reduced through the use of insulation.

(3) Erection is rapid, due to simplicity of design and method of clipping. Saddles are made from deck plates and are easily placed. These features speed completion of the building and effect economies in construction.



CROSS-SECTION AT OVERLAPPING END

Results — Clean, sanitary and pleasing interior. Heat insulation value depends on the thickness and efficiency of the roof insulation board used.

Master Specifications

USG STEEL ROOF DECK

(1) WORK INCLUDED

NOTE—*Here list the various roof areas to be constructed of USG Steel Roof Deck.*

(2) MATERIALS

The steel deck shall be manufactured by the United States Gypsum Company from copper-bearing steel and painted light gray after fabrication.

Deck plates shall have reinforcing ribs not more than 6 in. O.C., 1½ in. deep, ½ in. wide at base. Plates shall have stiffening beads formed into the plates midway between the reinforcing ribs. Deck plates shall be U.S.S. No. **[specify]** gauge.

Clips shall be furnished for securely fastening the deck plates to the purlins, and for interlocking adjoining deck plates together at the ends and midway between the purlins.

(3) ERECTION

Erection shall be done by an experienced erector, subject to the architect's approval.

All end laps shall be not less than 2 in. in length and shall be made directly over the purlins.

Each plate shall be securely fastened to the purlin by **[steel clips engaging the deck rib] [welding].**

Each plate shall be securely fastened to the adjoining plate by at least three intermediate clips.

THE RED BOOK

UNITED STATES GYPSUM COMPANY

300 West Adams Street

Chicago, Illinois

• • •

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UNITED STATES GYPSUM COMPANY

Phipps Houses, Inc., Woodside, Long Island, N. Y.

AEROCRETE

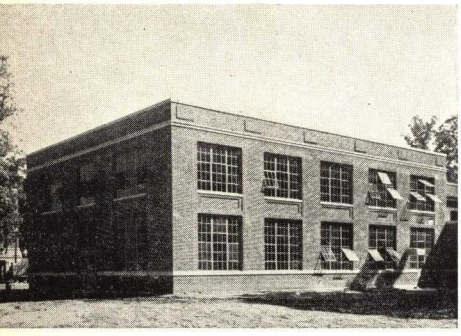
LIGHTWEIGHT CONCRETE

1929

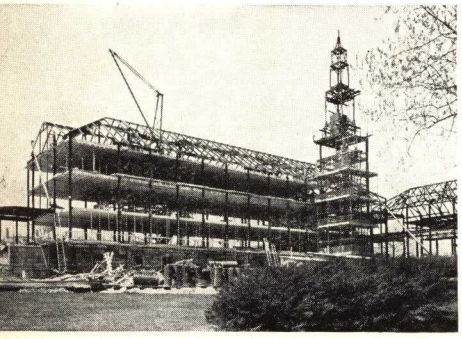
1931

1933

1938



1932



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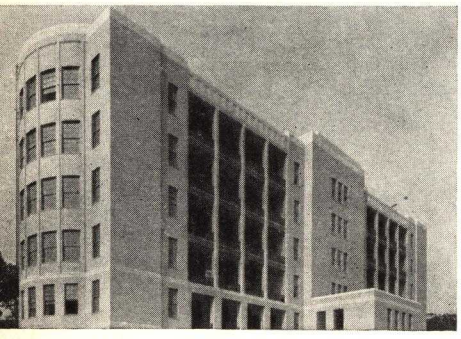
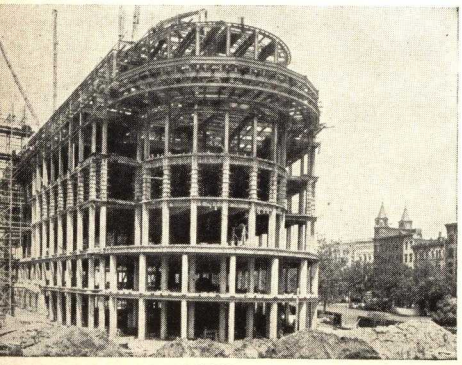


1936



1937

A FEW BUILDINGS IN ★ WHICH AEROCRETE REG. TRADE MARK WAS USED

1929-1938

	JOB	ARCHITECT	TYPE OF CONSTRUCTION
1929	Top Addition, Office Bldg. Bethlehem Steel Company, Bethlehem, Pa.	Graham, Anderson, Probst & White, Chicago, Ill.	Structural Arches and Fireproofing, Floor Fill, in six top stories
1931	Majestic Apartments, Central Park West, New York City	Irwin Channing, New York City	Sound Insulating Partitions
1932	Dynamometer Building, U. S. Bureau of Standards, Washington, D. C.	U. S. Bureau of Standards	Reinforced Aerocrete Structural Roof, Partition Slabs
1933	Rockefeller Center, New York City	Reinhart & Hofmeister. Corbett, Harrison & McMurray. Hood & Fouilhoux. New York City	*N.B.C. Studios*: Partitions *Sunken Plaza*: Structural Arches and Fill
1935	Miriam Osborne Home, New Wing, Rye, N. Y.	James Gamble Rogers, New York City	Long Span Floors, Floor Fill
1936	Children's Pavilion, Seaview Hospital, Staten Island, N. Y.	Adolph Mertin, New York City	Long Span Floors, Floor Fill
1937	Federal Trade Commission Building, Washington, D. C.	Bennett, Parsons & Frost, Chicago, Ill.	Structural Arches, Floor Fill
1938	A. I. Du Pont Building, Miami, Fla.	Marsh & Saxelbye, Jacksonville, Fla.	Floor Fill

AEROCRETE CORPORATION OF AMERICA
R.C.A. Building, Rockefeller Center
49 West 49th Street
NEW YORK, N. Y.

AEROCRETE WESTERN CORPORATION
737 North Michigan Avenue
CHICAGO, ILL.

AEROCRETE

LIGHTWEIGHT >>> CONCRETE

Aerocrete Block
Showing Air Cells Actual Size

WHY AEROCRETE FOR THE MODERN BUILDING

In the search for improved serviceability and economy, progressive engineers are paying increasing attention to the elimination of unnecessary weight or dead load. To this trend in the building industry, light weight concrete in general, and Aerocrete in particular, are making an important contribution.

Aerocrete is a light weight concrete. Together with its companion material, Gritcrete, it can be produced on the job to weigh from 50 to 108 lbs. per cu. ft. These weights compare with 144 lbs. per cubic foot for stone concrete. In buildings designed for men and women to live and work in, as distinct from those used for heavy loadings such as warehouses or industrial plants, the use of Aerocrete will afford economy of space, money, or both.

Foremost in the properties of Aerocrete is its high degree of resistance to the passage of sound. The even, cellular structure of Aerocrete not only accounts for its high resistance to sound, but makes it likewise an excellent insulator to heat and cold. Since Aerocrete is as indestructible as concrete, its thermal insulation will last as long as the building in which it is used. Aerocrete is likewise a superior fireproofing medium.

WHAT IS AEROCRETE

Aerocrete is simply a mixture of Portland Cement, properly graded sand and water. These ingredients are first proportioned to give the desired weight, and are then mixed at the job site in the standard type concrete mixer, no special equipment of any sort being necessary. At the time of mixing there is added our Aerocrete Admixture, which has the property of reacting with the alkaline constituents of the Portland Cement. In this reaction, a small percentage of the mixing water is broken down into its component gases, and these, as they are formed, cause the wet concrete to expand after placing by a controlled, predetermined amount.

The start of the expansion does not occur until fifteen or twenty minutes after the Aerocrete has been mixed, giving plenty of time in which to get the material in place. The rise then continues slowly for a period of from forty-five to sixty minutes. The timing and the amount of expansion is exact within close practical limits.

WHY IS AEROCRETE ECONOMICAL

The resulting economy is important. Depending on the desired weight, the expansion varies from 75 to 30 per cent of the original pouring height; the lighter the weight the greater the expansion. Therefore, due to the bulking action of the mass after placing, and to the natural workability of the wet Aerocrete, the cost of placing Aerocrete is consistently less on any production operation than that for ordinary concrete.

Aerocrete does not involve the use of special equipment. The usual type of concrete mixer, together with a bucket or platform hoist, and standard concrete buggies for placing, represent the usual construction outfit. If desired, the material can be delivered in ready-mixed concrete trucks, and the Compound added at the job site.

WHY DOES AEROCRETE HELP IN SOUNDPROOFING A BUILDING

Mention has been made that Aerocrete acts to retard the passage of sound. It has been widely used in many buildings for this reason and the excellent results obtained have been recorded in a number of tests as well as by the experience of the owners, architects and builders concerned. It

An Early Load Test on a Seven-foot Span of 4" Aerocrete Weighing 60 lbs. Per Cu. Ft., Showing Arch Supporting a Load of 900 lbs. Per. Sq. Ft.

An Early Load Test of Long Span Aerocrete Floor System. The Span is 29 Ft. and the Load Producing Failure was 330 lbs. Per Sq. Ft.

was selected for use by the National Broadcasting Company for the partitions of the Studios of Radio City in Rockefeller Center. As precast blocks for partitions and poured in place for structural floors and floor fill, Aerocrete is a preferred material to be used to obtain a more sound proof building. In addition to the above, and this is particularly true of office buildings and the like, Aerocrete is considerably easier to cut into if changes in the location of pipes or conduits are required. The resulting noise and inconvenience to adjoining tenants is thereby greatly lessened.

IS AEROCRETE FIREPROOF

Aerocrete has the same rating as stone concrete from the Rating Board of the Fire Underwriters. It is a fully fireproof material, as proven by a series of rigorous tests carried out under conditions designed to duplicate a severe fire in a restricted space. In such a test, for example, conducted for the Building Department of New York City by Columbia University, a thermo-couple or high temperature thermometer was placed only two inches away from the surface of the Aerocrete encasing a steel beam. The beam was exposed on three sides to the action of the fire, which was maintained at a temperature of over 1700° Fahrenheit for four hours. The temperature at the point described rose only from 47° to a maximum of 221°, while two inches away a roaring inferno of 1700° continued during the four hours mentioned.

DOES AEROCRETE RESIST THE PASSAGE OF HEAT AND COLD

Look at the photograph on the previous page showing the actual size and nature of the cells making up a block of Aerocrete. The reader will note that these cells consist of evenly distributed, closed voids. These air cells resist the passage of heat or cold. This is highly important in roof construction. Part or all of the expensive, impermanent, vegetable, insulating material may be eliminated with a consequent saving in cost. Such a saving may be a highly important factor in a factory, auditorium, or gymnasium where the roof covers a large area and represents a sizable proportion of the cost of the Building. There are numerous installations, both in the north where the severity of the winters have tested Aerocrete, and in the south where the summer sun is at a maximum, of which the owners or occupants will be pleased to attest to the excellence of Aerocrete as an insulator to heat and cold.

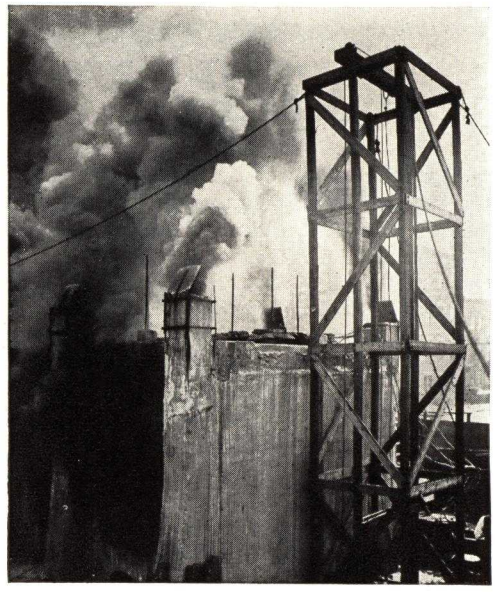
COEFFICIENTS OF HEAT TRANSMISSION

Material	Wgt. per cu. ft., lbs.	C*	Equivalent thickness, in.
Corkboard	10	0.30	1.00**
Aerocrete	50	1.44	4.80)
Aerocrete	60	1.80	6.00)
Aerocrete	70	2.18	7.27) †
Aerocrete	80	2.56	8.53)
Brickwork (dry)	132	4.00	13.33)
Concrete	140	8.30	27.70) ††
Cinder concrete	110	5.20	17.35†
Gypsum	...	2.98	9.93‡

*C—Coefficient of heat transmission in B.t.u. per hour, per square foot, per inch thickness, per degree difference Fahrenheit.

**Bureau of Standards. ††Willard, Light & Harding.

†Peebles, Armour Institute. ‡A. S. R. E., Committee Report.



Four Hour Fire Test on Aerocrete in 1927, For New York Building Department.

AEROCRETE STRUCTURAL FLOORS FOR MODERN FIREPROOF CONSTRUCTION

In considering the merits of different structural systems for his new project, the designing architect or engineer will pay particular attention to certain basic qualifications. The type of floor selected should certainly be one which has proven its usefulness over a period of years, with a full record of successful installations. It should enable the builder to proceed with the work with due speed and proper economy. It should be one which uses readily obtainable materials and equipment, under conditions that will not produce delays or labor difficulties as the job progresses. The system and the material should be properly adjustable to take care of the various conditions of span, loading, and use, that normally occur even in the simplest type of structure. It should not occupy an undue percentage of the cubical contents of the building. It should be highly soundproof, free from any tendency to vibrate, able to take occasional concentrated overloadings, and it should be of such a nature that minor alterations, often required in later occupancy, can be made without a complete reconstruction of the floor slab or structural panel.

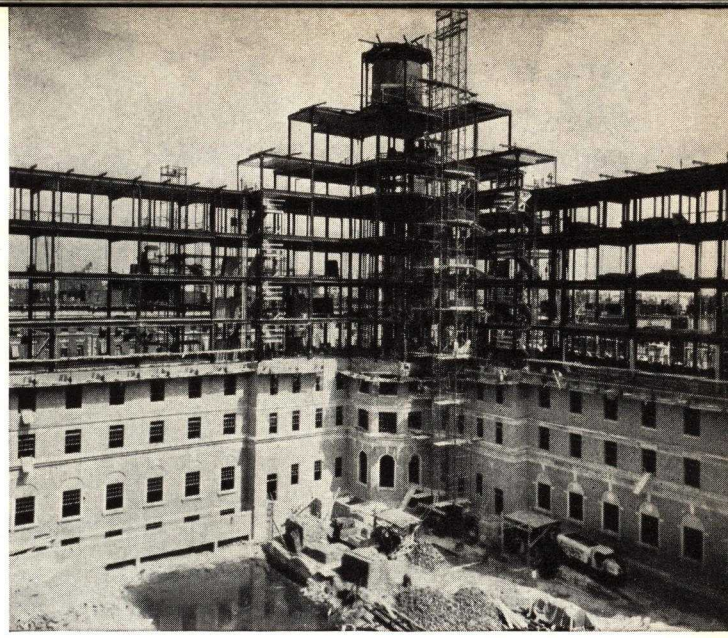
AEROCRETE FLOORS GIVE THESE ADVANTAGES

Floors of reinforced Structural Aerocrete have been in use in the United States since 1928. The first major structural installation was made in the office building of the Bethlehem Steel Company, Bethlehem, Pa.

The use of Aerocrete in this project enabled the architects to increase the height of the top addition by a much needed six stories instead of the four which was all that could have been obtained otherwise.

Since that time, and during the severest depression in the history of the building industry, the use of Aerocrete in structural floors and roofs has steadily expanded. This progress has undoubtedly been due to the economy and merits of the material, the flexibility possible in design and lay out, the strength and rigidity of the resulting construction, and the shallow depth and excellent sound insulation obtainable.

The buildings illustrated herein are representative of the best in American Construction. In the space of a catalogue only a few projects can be illustrated. A full list of related installations will be gladly sent to any architect or engineer who is considering types of floor construction for a new project.



Progress Photograph of Long Span Floor System Installed in Harlem Hospital, New York City. Sloan & Robertson, Architects

GRITCRETE IN SHORT SPAN CONSTRUCTION

A NEW STRUCTURAL MATERIAL

Gritcrete is a new structural material weighing 108 lbs. per cu. ft. Developed in 1936 to compete with 1:2:5 cinder concrete, it has also been widely used in localities where cinders are unavailable or unsatisfactory. Gritcrete consists of a mixture of Portland Cement and 5½ parts aggregate. The aggregate is composed of one part sand to one and a half parts pea gravel, and can be delivered to the job ready mixed, as there is no danger of segregation in a mixture of sand and pea gravel in these proportions.

READILY AVAILABLE AND ECONOMICAL

Gritcrete, therefore, can be specified wherever sand and gravel are available. It utilizes the well-established Aerocrete principle to aerate the above ingredients to a density of 108 lbs. per cu. ft. With a water-cement ratio of 7 gallons to the sack, a slump of seven to eight inches is obtained. Due to the excellent workability and to the bulking action of 30 per cent, the cost of placing Gritcrete is extremely low. The installed cost of Gritcrete will be found considerably less than comparable figures for stone concrete. Due to the economy and speed with which the form work can be erected and re-used, Gritcrete arches and flat slabs can be installed on steel frame structures at prices considerably below those for competing systems of structural framing.

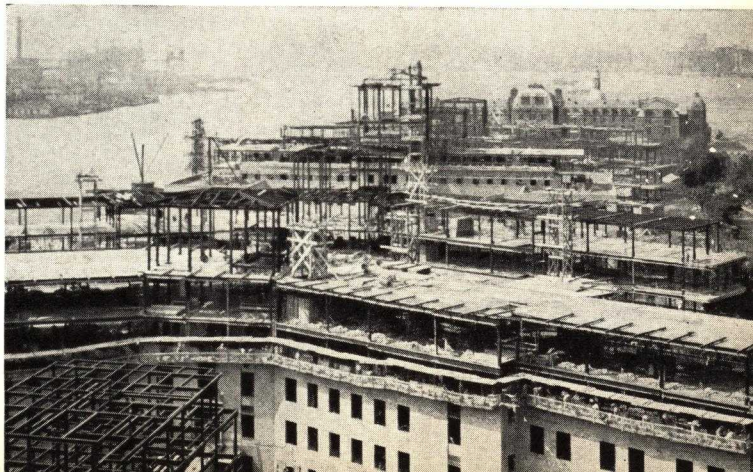
THE NEW FEDERAL TRADE COMMISSION BUILDING

The first installation on a large scale was made early in 1937 in the new building to house the Federal Trade Commission. The Procurement Division of the Treasury Department specified a concrete to weigh 108 lbs. per cu. ft. with an ultimate strength of 800 lbs. per sq. in., as well as a load test on a completed panel. Gritcrete was selected by the contractor, McCloskey & Company, of Philadelphia, to whom we are pleased to refer anyone interested in how Gritcrete worked out on this project.

THE NEW CHRONIC DISEASE HOSPITAL, NEW YORK CITY

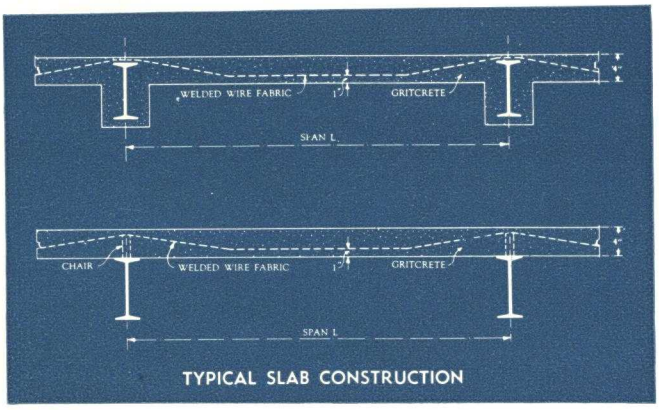
The New Chronic Disease Hospital being erected on Welfare Island was designed by Butler & Kohn, York & Sawyer, Architects; H. G. Balcom & Associates, Consulting Engineers. In direct competition with cinder concrete, Gritcrete was selected due to its superior features. Tests, before and during construction, were made for the New York City Building Department, under the supervision of the Department of Hospitals, and the results obtained are matters of record. Further information concerning the serviceability and utility of Gritcrete can be obtained from the General Contractors, Cauldwell-Wingate Company, or from the Concrete Sub-contractor, the Knickerbocker Fireproof Arch Company, both of New York City.

We take considerable pride in the ready acceptance that has been given to this new material. We will be pleased to supply those interested with any further data required in addition to the tables and details shown herewith.



New Chronic Disease Hospital, Welfare Island, New York City

GRITCRETE IN SHORT SPAN CONSTRUCTION



TYPICAL SLAB CONSTRUCTION

Structural arches and fireproofing of Gritcrete, in connection with a structural steel frame, provide an extremely economical and speedy type of construction. All form work is hung from the steel and can be stripped in from three to four days during normal curing weather. During winter construction, the cost of protection is lowered.

The neighboring tables illustrate the styles and sizes of welded mesh required for the various spans and loads occurring in general practice. Experience in New York City where this type of construction is practically standard for multi-storied buildings is the best evidence of its flexibility in design and low erected cost.

GRITCRETE IN LONG SPAN CONSTRUCTION

For those areas of a building where it is desirable to provide flat ceilings, Gritcrete can be used in conjunction with shallow trusses to provide a floor of extreme rigidity and shallow depth. The trusses are designed to carry the dead load of the concrete so that the form work is extremely inexpensive and can be readily stripped. No posts or shores are required. Conduits can be run in any direction through the slabs. An excellent bond to plaster is obtained, due to the cellular structure of the concrete.

In the drawing below the construction is fully illustrated. The designer will note that with Gritcrete he is able to design freely and economically for the architectural conditions as they occur. Where flat ceilings are desired, as in the living and bed rooms of an apartment house project, the long span system will suggest itself. In kitchens, corridors, and bathrooms, the somewhat more economical short span construction can be used. We will be pleased to submit design data for estimating purposes, as in a wide number of instances this construction has proven its competitive economy and usefulness.

STYLES OF WELDED WIRE FABRIC FOR VARIOUS LOADS AND SPANS

BASED ON FORMULAS OF 1938 CODE OF NEW YORK CITY

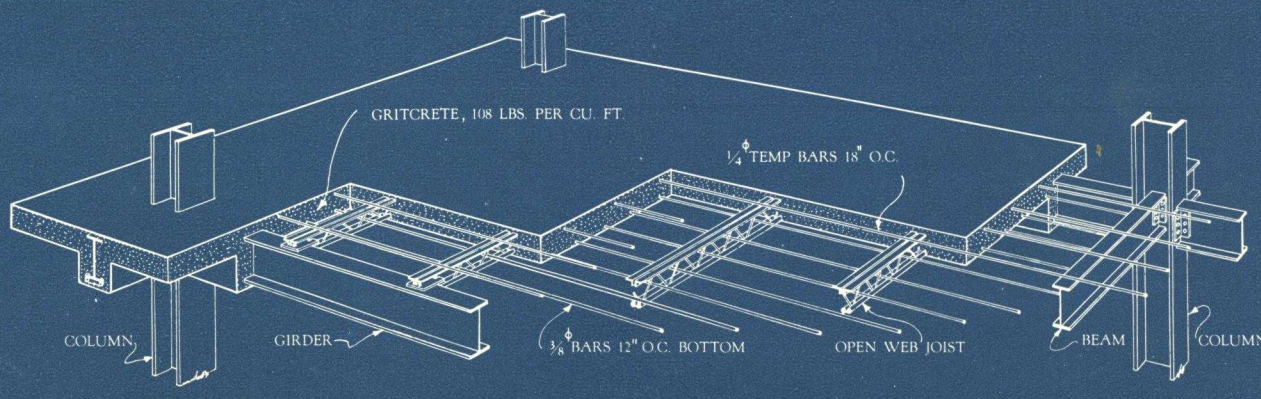
Weight ..... 108 lbs./cu. ft.
Ult. Stress in Compression ..... 800 lbs./sq. in.
Computations w = 3 x As x 20,000 ÷ L x L

w \ L	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″	
80#/□′	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x16″ #7 & #11	3″x16″ #8 & #12	4″x16″ #6 & #10	4″ Slab
100#/□′	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x16″ #7 & #11	4″x16″ #6 & #10	3″x16″ #7 & #11	3″x16″ #6 &#10	
120#/□′	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x16″ #7 & #11	4″x16″ #6 & #10	3″x16″ #7 & #11	3″x16″ #6 & #10	3″x16″ #5 & #10	
140#/□′	4″x12″ #8 & #12	4″x16″ #7 & #11	4″x16″ #6 & #10	4″x16″ #5 & #10	3″x16″ #6 & #10	3″x16″ #5 & #10	3″x16″ #4 & #9	
160#/□′	4″x16″ #7 & #11	3″x16″ #8 & #12	3″x16″ #7 & #11	3″x16″ #6 & #10	3″x16″ #5 & #10	3″x16″ #4 & #9	2″x16″ #6 & #10	
180#/□′	3″x16″ #8 & #12	3″x16″ #7 & #11	3″x16″ #6 & #10	3″x16″ #5 & #10	2″x16″ #7 & #11	2″x16″ #6 & #10	2″x16″ #5 & #10	

BASED ON REINFORCED CONCRETE FORMULAS

Weight ..... 108 lbs./cu. ft.
Ult. Stress in Compression ..... 800 lbs./sq. in.
Working Stress—Gritcrete ..... 300 lbs./sq. in.
Wire ..... 18,000 lbs./sq. in.
Shear ..... 30 lbs./sq. in.
Computations Moment = wL x L ÷ 12
Shear = wL ÷ 2bjd

w \ L	5′-0″	5′-6″	6′-0″	6′-6″	7′-0″	7′-6″	8′-0″	
80#/□′	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x16″ #7 & #11	4″x16″ #6 & #10	3″x16″ #7 & #11	4″ Slab
100#/□′	4″x12″ #8 & #12	4″x12″ #8 & #12	4″x16″ #7 & #11	3″x16″ #8 & #12	3″x16″ #7 & #11	3″x16″ #6 & #10	2″x16″ #6 & #10	
120#/□′	4″x12″ #8 & #12	4″x16″ #7 & #11	3″x16″ #8 & #12	3″x16″ #7 & #11	3″x16″ #5 & #10	2″x16″ #5 & #10	2″x16″ #7 & #11	4½″ Slab
140#/□′	4″x12″ #8 & #12	3″x16″ #8 & #12	3″x16″ #7 & #11	3″x16″ #5 & #10	2″x16″ #4 & #9	2″x16″ #7 & #11	2″x16″ #4 & #9	
160#/□′	4″x16″ #7 & #11	4″x16″ #6 & #10	3″x16″ #6 & #10	2″x16″ #5 & #10	2″x16″ #7 & #11	2″x16″ #4 & #9	2″x16″ #6 & #10	
180#/□′	3″x16″ #8 & #12	4″x16″ #5 & #10	2″x16″ #6 & #10	2″x16″ #7 & #11	2″x16″ #5 & #10	2″x16″ #6 & #10	2″x16″ #4 & #9	5″ Slab



GRITCRETE FLAT CEILING FLOOR CONSTRUCTION

AEROCRETE "F. S." FLOOR CONSTRUCTION

The Aerocrete "F. S." Floor Construction consists of a combination of Aerocrete with stone concrete and steel, to form a composite reinforced concrete floor with properties of great stiffness and rigidity, minimum thickness, absolute fireproofness, and high sound insulation. The underside of the slab is flat, ready to receive the plaster direct.

HOW THE "F. S." FLOOR IS MADE UP

For simplicity, the construction may be considered to consist of three parts. First, there is a flat slab of Aerocrete of a density of 70 lbs. per cu. ft. Secondly, embedded in the Aerocrete is a steel member, the bottom flange of which is 1″ up in the Aerocrete. This steel member consists of a heavy tension chord connected by an open web system to a lighter top chord, this last extending up above the Aerocrete. Thirdly, this top member is encased in a slab of stone concrete 2 to 2½″ thick, the steel and the concrete together taking the compressive stresses, as will be described in what follows.

FORMS ARE HUNG FROM JOISTS

As a practical construction expedient, the steel reinforcement is prefabricated in the form of sturdy reinforced trusses, ranging in weight from 6 to 30 lbs. per lin. ft., depending upon span and load. From these trusses are hung the forms for receiving the Aerocrete. As a result, these forms are of the most economical type, consisting of flat sheathing lumber laid on stringers, and the need for posting, shoring or centering is eliminated. As the top member of the truss is designed to take the stresses resulting from the combined weight of the Aerocrete and the concrete, the forms can be stripped in from three to four days.

FURTHER DETAILS OF "F. S." FLOOR

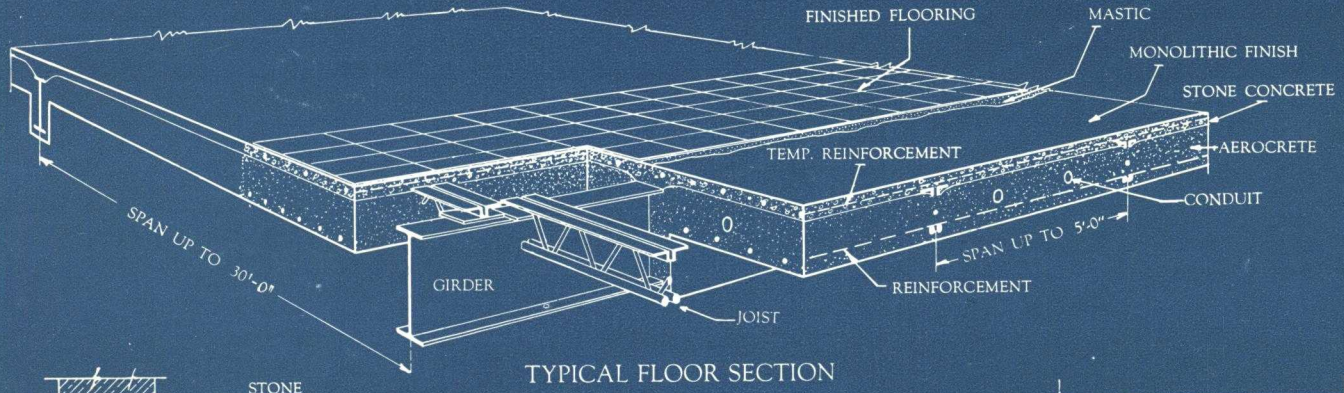
The trusses are spaced from 3 to 5 ft. apart, the wider spacing being the more economical where conditions permit. After the forms have been placed and the Aerocrete is poured, the stone concrete is placed within 24 to 48 hours. The concrete may be finished monolithically to receive, or to act as, the finished flooring.

The finished construction provides a smooth underside ready for plastering. This underside consists of a continuous flat surface of Aerocrete to which an excellent bond with plaster is obtained.

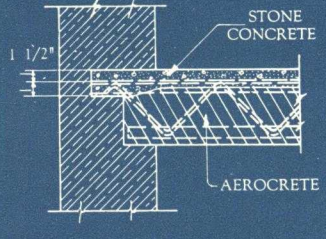
Using an open truss in the construction enables conduits, and in the larger sizes, pipes as well, to be run in any direction through the open webs. In this way the necessity for a floor fill is obviated, with a consequent saving in cost, in dead load, and in floor thickness.

SUMMARY

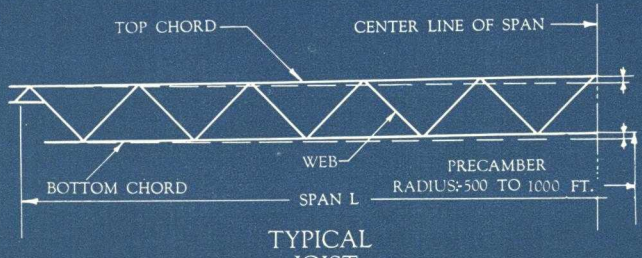
To sum up, this floor system consists of a stone concrete slab reinforced by a steel member, prefabricated to carry the forms and the dead load, and an Aerocrete filler. Compressive and tensile stresses are taken in the concrete and steel. Shear stresses are taken by the steel and the Aerocrete. Flat forms are hung from the steel so that the erection is speedy, easy and economical. Conduits can be run through the trusses in any direction. A permanent economical plaster finish is insured, due to the flat continuous underside of Aerocrete. The resulting floor is absolutely fireproof and highly soundproof. The nature of the design permits of extreme flexibility in laying out the system in practice. Owing to the special reinforcing of the trusses, an exceptionally stiff and rigid floor results. A table of spans and loads follows.



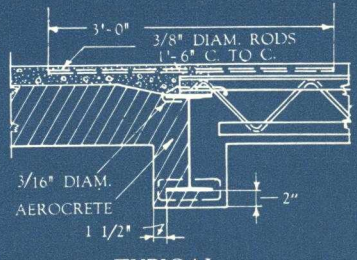
TYPICAL FLOOR SECTION



TYPICAL SUPPORT ON WALL



TYPICAL JOIST



TYPICAL SUPPORT ON GIRDER

AEROCRETE "F S" FLOOR CONSTRUCTION

AEROCRETE "F.S." FLOOR CONSTRUCTION

SAFE APPLIED LOADS PER SQ. FT. D = 6½" THICK SLAB H = 4¼" WEIGHT = 49 LB. PER SQ. FT.

SPAN IN FT.	10′-0″					10′-6″					11′-0″					11′-6″					12′-0″				
SPACING IN IN.	36	39	42	45	48	36	39	42	45	48	36	39	42	45	48	36	39	42	45	48	36	39	42	45	48
JOISTS 4-1	104-A	91-A	79-A	70-A	61-A	88-A	76-A	66-A	57-A	49-A	76-A	64-A	54-A	46-A	39-A	62-A	52-A	44-A	36-A		51-A	43-A	34-A		
" 4-2	131-A	118-A	103-A	89-A	79-A	112-A	99-A	87-A	76-A	65-A	94-A	85-A	73-A	64-A	56-A	83-A	72-A	62-A	53-A	45-B	70-A	61-A	51-A	43-B	36-B
" 4-3	157-A	139-A	125-A	113-A	103-A	136-A	120-A	107-A	96-A	87-A	118-A	105-A	92-A	82-A	73-A	103-A	90-A	78-A	70-A	62-B	89-A	78-A	67-A	59-B	51-B
" 4-4		170-A	153-A	139-A	128-A	166-A	148-A	133-A	120-A	108-A	146-A	129-A	116-A	104-A	93-A	128-A	114-A	101-A	90-B	79-B	112-A	99-A	87-B	77-B	68-B
" 4-5			180-B	163-B	148-B		174-B	156-B	141-B	128-B		153-B	137-B	124-B	112-B	151-B	135-B	120-B	108-B	97-B	134-B	119-B	105-B	94-B	84-B
" 4-6										151-B			161-B	146-B	133-B		157-B	141-B	128-B	116-B	156-B	139-B	124-B	112-B	101-B
" 4-7															153-C				148-C	135-C		162-C	146-C	131-C	119-C
" 4-8																			158-C	147-C			158-C	148-C	137-C

SEE MARKING NOTES

SPAN IN FT.	12′-6″					13′-0″					13′-6″					14′-0″					14′-6″					15′-0″				
SPACING IN IN.	36	39	42	45	48	36	39	42	45	48	36	39	42	45	48	36	39	42	45	48	36	39	42	45	48	36	39	42	45	48
JOISTS 4-2	60-A	50-A	42-B	35-B		50-A	42-B	34-B			42-B	34-B				34-B														
" 4-3	78-A	66-A	56-B	50-B	43-C	66-A	57-B	49-B	41-C	34-C	56-B	49-B	40-C	33-C		49-B	41-C	34-C			41-C	34-C				34-C				
" 4-4	99-A	86-B	75-B	66-B	58-C	84-B	75-B	65-B	56-C	48-C	75-B	65-B	55-C	47-C	40-D	65-B	55-C	46-C	39-D	32-D	56-C	47-C	39-D	32-D		48-C	39-D	32-D		
" 4-5	118-B	104-B	92-B	82-B	72-C	104-B	92-B	81-B	71-C	62-C	92-B	80-B	70-C	61-C	53-D	80-B	70-C	60-C	52-D	44-D	71-C	61-C	51-D	44-D	37-D	62-C	52-D	44-D	37-D	30-E
" 4-6	139-B	124-B	110-B	99-B	88-C	124-B	110-B	97-B	87-C	77-C	110-B	97-B	86-C	76-C	67-D	97-B	86-C	75-C	66-D	57-D	86-C	76-C	65-D	56-D	49-D	76-C	65-D	55-D	48-D	42-E
" 4-7	162-C	144-C	129-C	116-C	105-C	144-C	129-C	114-C	103-C	92-C	129-C	114-C	102-C	90-D	81-D	114-C	102-C	90-D	80-D	70-D	102-C	90-D	80-D	70-D	61-D	91-C	79-D	70-D	61-D	54-E
" 4-8		161-C	151-C	137-C	122-C	169-C	148-C	133-C	120-C	107-C	146-C	132-C	118-C	106-D	95-D	132-C	119-C	106-D	94-D	84-D	120-C	107-D	94-D	84-D	74-D	108-D	96-D	84-D	74-D	65-E

SEE MARKING NOTES

WORKING STRESSES
fs —18,000 lb. per sq. in. (Max.)
f's—20,000 lb. per sq. in. (Max.)
fc — 650 lb. per sq. in. (Max.)
n — 15
Shear 17 lb. per sq. in. from applied load. Shear from wt. of slab taken by the joists.

MARKING 4-5D
4 Nominal depth of joist.
-5 Bottom chord and web.
D Top chord.
4-5 as found in left margin.
D as found to right of load.

SAFE APPLIED LOADS PER SQ. FT. D = 7½" THICK SLAB H = 5¼" WEIGHT = 55 LB. PER SQ. FT.

SPAN IN FT.	13′-0″						13′-6″						14′-0″						14′-6″						15′-0″					
SPACING IN IN.	36	39	42	45	48	51	36	39	42	45	48	51	36	39	42	45	48	51	36	39	42	45	48	51	36	39	42	45	48	51
JOISTS 5-5	136-B	121-B	107-B	95-B	80-B	68-C	121-B	107-B	94-B	84-B	74-C	63-C	107-B	95-B	83-B	73-C	64-C	56-D	96-B	84-B	73-C	64-C	55-D	47-D	84-B	74-C	64-C	55-D	47-D	40-D
" 5-6	160-B	143-B	128-B	115-B	103-B	92-C	144-B	129-B	114-B	102-B	91-C	81-C	130-B	115-B	101-B	90-C	80-C	71-D	117-B	103-B	90-C	79-C	70-D	62-D	104-B	91-C	79-C	69-D	61-D	53-D
" 5-7			150-C	134-C	121-C	109-C		150-C	134-C	120-C	109-C	98-C	151-C	135-C	120-C	107-C	96-C	86-D	136-C	121-C	107-C	96-C	85-D	75-D	122-C	108-C	96-C	85-D	75-D	66-D
" 5-8				152-C	141-C	130-C			154-C	139-C	126-C	114-C		155-C	138-C	124-C	112-C	101-D	156-C	139-C	124-C	112-C	100-D	89-D	141-C	126-C	112-C	100-D	89-D	79-D
" 5-9					162-D	147-D				160-D	146-D	133-D			159-D	145-D	131-D	117-D		160-D	144-D	130-D	117-D	105-D	162-D	145-D	130-D	117-D	105-D	94-D

SPAN IN FT.	15′-6″						16′-0″						16′-6″						17′-0″						17′-6″					
SPACING IN IN.	36	39	42	45	48	51	36	39	42	45	48	51	36	39	42	45	48	51	36	39	42	45	48	51	36	39	42	45	48	51
JOISTS 5-5	75-C	65-C	55-D	47-D	39-D		66-C	56-D	47-D	40-D			58-D	48-D	40-D				51-D	42-D					44-D					
" 5-6	92-C	80-C	69-D	60-D	52-D	45-E	82-C	71-D	61-D	52-D	45-E	38-E	73-D	63-D	53-D	45-E	38-E		65-D	55-D	46-E	39-E			58-D	48-E	40-E			
" 5-7	110-C	97-C	85-D	75-D	66-D	58-E	99-C	86-D	76-D	66-D	58-E	50-E	89-D	77-D	67-D	58-E	50-E	43-E	81-D	69-D	59-E	50-E	43-E	37-F	72-D	62-E	52-E	43-E	37-F	
" 5-8	127-C	113-C	101-D	89-D	79-D	70-E	115-C	101-D	90-D	79-D	71-E	62-E	104-D	91-D	80-D	71-E	63-E	54-E	94-D	82-D	72-E	63-E	55-E	46-F	85-D	73-E	64-E	55-E	47-F	40-F
" 5-9	148-D	132-D	117-D	105-D	94-D	84-E	135-D	120-D	105-D	94-D	84-E	75-E	123-D	109-D	94-D	84-E	75-E	67-F	112-D	99-D	85-E	75-E	67-F	60-F	102-D	89-E	77-E	67-F	60-F	53-F

SAFE APPLIED LOADS PER SQ. FT. D = 8½" THICK SLAB H = 6¼" WEIGHT = 60 LB. PER SQ. FT.

SPAN IN FT.	15′-0″							15′-6″							16′-0″							16′-6″						
SPACING IN IN.	36	39	42	45	48	51	54	36	39	42	45	48	51	54	36	39	42	45	48	51	54	36	39	42	45	48	51	54
JOISTS 6- 7	153-C	136-C	115-C	98-C	87-C	79-D	68-D	138-C	121-C	108-C	97-C	82-D	72-D	62-D	125-C	110-C	97-C	87-D	77-D	68-D	60-E	113-C	99-C	87-D	77-D	68-D	60-E	52-E
" 6- 8		158-C	142-C	128-C	115-C	102-D	93-D	157-C	143-C	127-C	115-C	102-D	92-D	83-D	145-C	129-C	115-C	103-D	92-D	82-D	74-E	133-C	118-C	104-D	93-D	82-D	73-E	66-E
" 6- 9			162-D	157-D	133-D	120-D	108-D			148-D	133-D	120-D	108-D	99-D		149-D	134-D	120-D	108-D	98-D	88-E	152-D	136-D	122-D	109-D	98-D	88-E	79-E
" 6-10					174-E	160-E	146-E				174-E	158-E	145-E	133-E			174-E	160-E	144-E	132-E	120-E		176-E	161-E	145-E	132-E	120-E	109-E

SPAN IN FT.	17′-0″							17′-6″							18′-0″							18′-6″						
SPACING IN IN.	36	39	42	45	48	51	54	36	39	42	45	48	51	54	36	39	42	45	48	51	54	36	39	42	45	48	51	54
JOISTS 6- 7	103-C	89-D	78-D	69-D	60-E	52-E	45-E	93-D	80-D	70-D	61-E	52-E	45-E	39-F	84-D	72-D	62-E	53-E	45-E	39-F		76-D	64-E	55-E	46-E	39-F		
" 6- 8	121-C	107-D	94-D	83-D	73-E	65-E	58-E	110-D	96-D	85-D	74-E	65-E	58-E	51-F	100-D	87-D	76-E	66-E	58-E	51-F	44-F	91-D	79-E	68-E	59-E	51-F	44-F	37-G
" 6- 9	140-D	124-D	110-D	98-D	88-E	79-E	70-E	128-D	113-D	100-D	89-E	79-E	70-E	62-F	116-D	102-D	90-E	80-E	70-E	62-F	55-F	106-D	93-E	82-E	72-E	63-F	55-F	48-G
" 6-10		163-E	146-E	132-E	120-E	109-E	99-F	169-E	150-E	134-E	121-E	109-E	99-F	89-F	156-E	138-E	123-E	110-E	99-F	89-F	80-F	143-E	126-E	112-E	100-F	89-F	80-F	72-G

SPAN IN FT.	19′-0″							19′-6″							20′-0″						
SPACING IN IN.	36	39	42	45	48	51	54	36	39	42	45	48	51	54	36	39	42	45	48	51	54
JOISTS 6- 7	68-D	57-E	48-E	40-F				61-E	51-E	42-F					54-E	46-F					
" 6- 8	82-E	71-E	60-E	52-F	45-F	37-G		75-E	64-E	53-F	46-F	39-G			68-E	57-F	47-F	40-G			
" 6- 9	97-E	85-E	74-E	64-F	56-F	48-G	42-G	89-E	77-E	67-F	57-F	49-G	42-G	36-H	82-E	70-F	60-F	50-G	43-G	36-H	
" 6-10	131-E	115-E	102-F	91-F	81-F	72-G	65-G	121-E	107-F	94-F	82-F	73-G	65-G	58-H	112-F	99-F	87-F	76-G	66-G	58-H	52-H

1.) In figuring any concentrated applied loadings, max. allowable reactions may be taken as those reactions which are produced by the uniform loadings shown in this table for the spacings given.

2.) Calculations are based on forms hung from joists (which are designed to take the dead load of slab).

3.) All joists shall be cambered as noted.

AEROCRETE "FS" FLOOR CONSTRUCTION

SAFE APPLIED LOADS PER SQ. FT. D = 9½" THICK SLAB H = 7¼" WEIGHT = 66 LB. PER SQ. FT.

SPAN IN FT.	17′-6″								18′-0″								18′-6″								19′-0″							
SPACING IN IN.	36	39	42	45	48	51	54	57	36	39	42	45	48	51	54	57	36	39	42	45	48	51	54	57	36	39	42	45	48	51	54	57
JOISTS 7- 9	154-D	137-D	122-D	109-D	98-E	88-E	78-E	71-F	141-D	125-D	111-D	99-E	88-E	78-E	70-F	63-F	130-D	114-D	101-E	89-E	79-E	70-F	62-F	55-G	120-D	104-E	91-E	80-E	71-F	62-F	55-G	47-G
" 7-10		178-E	161-E	146-E	132-E	120-E	109-F	99-F		165-E	148-E	183-E	121-E	109-F	99-F	89-F	170-E	151-E	136-E	122-E	110-F	99-F	89-F	80-G	158-E	140-E	125-E	112-F	100-F	90-F	81-G	72-G
" 7-11				184-F	168-F	154-F	141-F	129-F			184-F	169-F	155-F	141-F	129-F	118-G			172-F	156-F	142-F	129-F	118-G	108-G		165-F	160-F	144-F	131-F	118-G	108-G	99-G

SPAN IN FT.	19′-6″								20′-0″								20′-6″								21′-0″							
SPACING IN IN.	36	39	42	45	48	51	54	57	36	39	42	45	48	51	54	57	36	39	42	45	48	51	54	57	36	39	42	45	48	51	54	57
JOISTS 7- 9	110-D	95-E	83-E	72-F	63-F	55-G	48-G	40-G	100-E	86-E	75-E	65-F	56-F	48-G	42-G		91-E	78-E	67-F	58-F	50-G				83-E	71-F	60-F	51-G				
" 7-10	146-E	129-E	115-F	102-F	91-F	81-G	73-G	65-G	136-E	119-F	105-F	93-F	82-G	73-G	65-G	58-H	125-F	109-F	96-F	84-G	74-G	66-G	58-H	51-H	115-F	100-F	88-F	77-G	67-G	59-H	51-H	
" 7-11		156-F	148-F	133-F	120-G	108-G	98-G	90-H	157-F	153-F	137-F	123-G	110-G	99-G	90-H	82-H	149-F	142-F	126-G	113-G	101-G	91-H	82-H	74-H	142-F	132-G	116-G	103-G	92-H	83-H	74-H	66-J

SPAN IN FT.	21′-6″								22′-0″								22′-6″								23′-0″							
SPACING IN IN.	36	39	42	45	48	51	54	57	36	39	42	45	48	51	54	57	36	39	42	45	48	51	54	57	36	39	42	45	48	51	54	57
JOISTS 7- 9	75-F	64-F	54-G						69-F	57-F	48-G						63-F	51-G							57-F	45-G						
" 7-10	106-F	92-F	80-G	70-G	61-H				98-F	84-G	73-G	63-H	55-H				90-G	77-G	66-G	56-H	49-H				83-G	70-G	60-H	50-H				
" 7-11	139-G	122-G	107-G	95-H	84-H	75-H	66-J	59-J	129-G	113-G	99-H	87-H	77-H	67-J	60-J		120-G	104-H	91-H	80-H	70-J	60-J	54-J		112-H	96-H	84-H	73-J	64-J	54-J		

SAFE APPLIED LOADS PER SQ. FT. D = 10½" THICK SLAB H = 8¼" WEIGHT = 75 LB. PER SQ. FT.

SPAN IN FT.	20′-0″					20′-6″					21′-0″					21′-6″					22′-0″					22′-6″				
SPACING IN IN.	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60
JOISTS 8-10	154-E	117-F	92-G	74-G	57-H	141-E	107-F	84-G	66-H	50-H	130-F	99-F	76-G	59-H	42-J	120-F	91-G	69-H	53-H		111-F	83-G	62-H	46-J		102-F	75-G	55-H		
" 8-11		153-F	125-G	101-H	83-H	180-F	141-F	115-G	93-H	75-H	167-F	131-G	104-H	85-H	68-J	156-F	121-G	97-H	77-H	61-J	145-G	112-G	88-H	69-J	54-J	135-G	104-H	81-H	63-J	48-J
" 8-12			159-H	132-H	112-H		176-G	146-H	122-H	102-J		166-H	136-H	112-H	93-J		156-H	126-H	103-J	85-J		146-H	116-H	95-J	77-J	169-G	134-H	107-J	87-J	70-J

SPAN IN FT.	23′-0″					23′-6″					24′-0″					24′-6″					25′-0″				25′-6″			26′-0″		
SPACING IN IN.	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	36	42	48	36	42	48
JOISTS 8-10	94-G	68-H	50-H			86-G	62-H	46-J			80-G	56-H				73-H	50-H				67-H	45-J			61-H			55-H		
" 8-11	125-G	96-H	74-J	57-J		116-H	88-H	67-J	50-J		108-H	81-H	61-J			100-H	74-J	55-J			93-H	67-J			86-H	62-J		79-J	57-J	
" 8-12	159-H	124-H	99-J	80-J	63-J	149-H	115-J	91-J	73-J	57-K	139-H	107-J	84-J	66-J	51-K	130-H	100-J	78-J	60-K		121-J	93-J	71-J	54-K	113-J	86-J	65-K	106-J	79-J	59-K

SAFE APPLIED LOADS PER SQ. FT. D = 11½" THICK SLAB H = 9¼" WEIGHT = 82 LB. PER SQ. FT.

SPAN IN FT.	23′-0″					23′-6″					24′-0″					24′-6″					25′-0″				25′-6″					
SPACING IN IN.	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60
JOISTS 9-11	146-G	113-H	88-H	69-J	53-J	136-G	105-H	81-J	62-J	47-J	127-G	97-H	74-J	56-J		118-H	89-H	67-J	50-J		109-H	82-J	61-J	44-J		102-H	76-J	55-J		
" 9-12	184-H	148-H	118-J	95-J	77-J	173-H	139-H	108-J	87-J	70-J	162-H	130-J	99-J	80-J	63-K	152-H	122-J	92-J	73-J	57-K	143-J	114-J	85-J	66-K	72-L	134-J	106-J	78-J	60-K	
" 9-13		170-J	149-J	124-J	96-J		170-J	139-J	114-J	91-K		159-J	130-J	106-J	85-K		150-J	121-J	98-K	79-L	167-J	141-J	112-J	90-K		161-J	132-J	104-K	83-L	66-L

SPAN IN FT.	26′-0″					26′-6″					27′-0″					27′-6″					28′-0″				28′-6″			29′-0″		
SPACING IN IN.	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	60	36	42	48	54	36	42	48	36	42	48
JOISTS 9-11	95-H	70-J	49-J			88-J	64-J	44-J			81-J	58-J				75-J	52-J				70-J	47-J			65-J			60-J		
" 9-12	126-J	98-J	72-J	55-K		118-J	91-J	66-K			110-J	84-J	61-K			103-J	77-K	55-K			96-J	71-K			90-J	66-K		84-K	61-K	
" 9-13	154-J	123-J	97-K	77-L	60-L	148-J	115-K	90-L	71-L		139-J	107-K	83-L	65-L		131-J	100-K	77-L	55-L		123-K	93-L	71-L		116-K	87-L	66-L	109-K	81-L	59-L

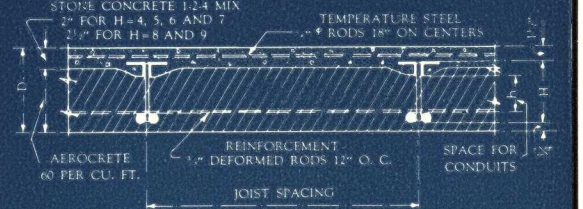
DIMENSIONS AND PROPERTIES OF "RS" JOISTS

Joists	Wt.	h	Joists	Wt.	h	Joists	Wt.	h	Joists	Wt.	h	Joists	Wt.	h	Joists	Wt.	h
4-1A	5.8	2¼	4-6E	11.5	1⅝	5-7F	12.8	2⅝	6-9D	13.7	3¾	7-11F	19.4	4¼	9-11G	20.0	5¾
4-2A	6.3	2⅛	4-7C	10.8	1⅝	5-8C	11.9	2½	6-9E	14.4	3½	7-11G	20.0	3¾	9-11H	20.9	6¼
4-2B	6.7	2⅛	4-7D	11.6	1⅞	5-8D	12.6	2¾	6-9F	15.0	3½	7-11H	20.9	4¼	9-11J	22.7	5¾
4-3A	6.8	2⅛	4-7E	12.2	1⅝	5-8E	13.3	2½	6-9G	15.6	3	7-11J	22.7	3¾	9-11G	22.5	5⅝
4-3B	7.3	2⅛	4-8C	11.9	1½	5-8F	13.9	2½	6-9H	16.5	3½	8-10E	16.5	5⅜	9-12H	23.4	6⅛
4-3C	7.7	1⅞	4-8D	12.6	1¾	5-9D	13.7	2¾	6-10E	16.5	3⅜	8-10F	17.1	5⅜	9-12J	25.2	5⅝
4-4A	7.7	2	4-8E	13.3	1½	5-9E	14.4	2½	6-10F	17.1	3⅜	8-10G	17.7	4⅞	9-12K	26.0	5⅛
4-4B	8.1	2	5-5B	8.8	3	5-9F	15.0	2½	6-10G	17.7	2⅞	8-10H	18.6	5⅜	9-13H	25.6	6
4-4C	8.5	1¾	5-5C	9.2	2¾	6-7C	10.8	3⅜	6-10H	18.6	3⅜	8-11F	19.4	5¼	9-13J	27.5	5½
4-4D	9.2	2	5-5D	9.9	3	6-7D	11.6	3⅛	7-9D	13.7	4¾	8-11G	20.0	4¾	9-13K	28.3	5
4-5B	8.8	2	5-6B	9.7	2⅞	6-7E	12.2	3⅝	7-9E	14.4	4½	8-11H	20.9	5¼	9-13L	29.1	5
4-5C	9.2	1¾	5-6C	10.1	2⅝	6-7F	12.8	3⅝	7-9F	15.0	4½	8-11J	22.7	4¾			
4-5D	9.9	2	5-6D	10.8	2⅞	6-8C	11.9	3½	7-9G	15.6	4	8-12G	22.5	4⅝			
4-5E	10.6	1¾	5-6E	11.5	2⅝	6-8D	12.6	3¾	7-10E	16.5	4⅜	8-12H	23.4	5⅛			
4-6B	9.7	1⅞	5-7C	10.8	2⅝	6-8E	13.3	3½	7-10F	17.1	4⅜	8-12J	25.2	4⅝			
4-6C	10.1	1⅝	5-7D	11.6	2⅞	6-8F	13.9	3½	7-10G	17.7	3⅞	8-12K	26.0	4⅞			
4-6D	10.8	1⅞	5-7E	12.2	2⅝	6-8G	14.5	3	7-10H	18.6	4⅜	9-11F	19.4	6¼			

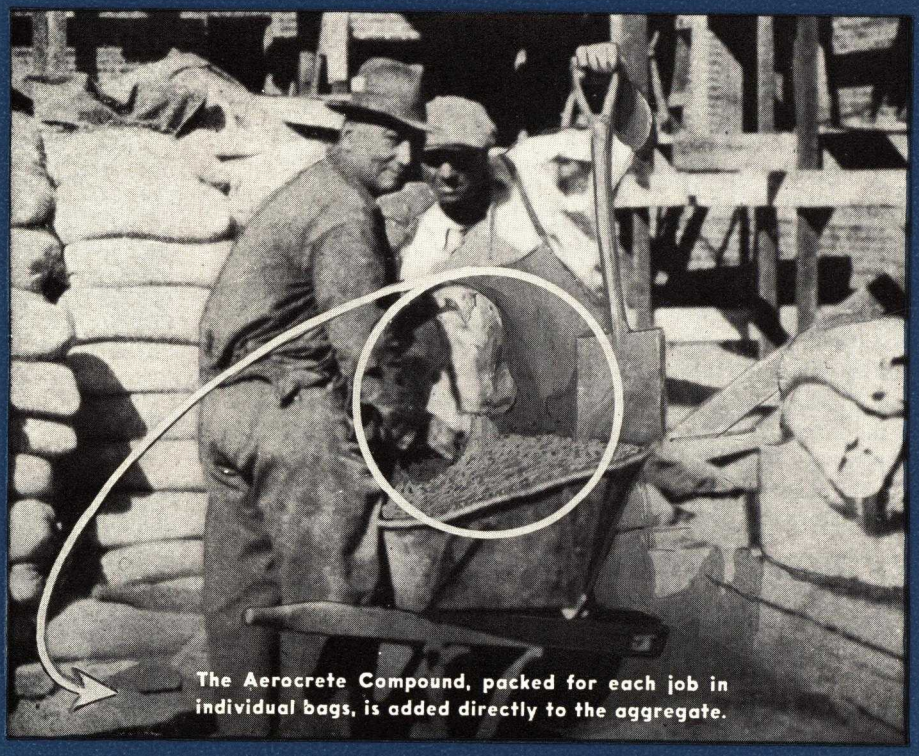
MATERIAL FOR JOIST MARKS

Diam's Bot. Chord & Web			Top Chords	
Mark	Bot. Chord	Web	Mark	2 Angles
1	2— ¾	7/16	A	1¼x1¼x⅛
2	2—15/16	7/16	B	1¾x1¼x⅛
3	2— ⅞	7/16	C	2 x1½x⅛
4	2—15/16	½	D	1¾x1¼x5/16
5	2—1	½	E	2 x1½x5/16
6	2—1 1/16	9/16	F	2½x1½x5/16
7	2—1⅛	9/16	G	2½x2 x5/16
8	2—1 3/16	⅝	H	2½x1½x¼
9	2—1¼	11/16	J	3 x2 x¼
10	2—1⅜	¾	K	3 x2½x¼
11	2—1½	13/16	L	3½x2½x¼
12	2—1⅝	⅞		
13	2—1¾	⅞		

Example 6-7C indicates H = 6¼" B.C. = 2-1⅛" rods Web = 1-9/16" rod Top Chord = 2 Angles 2x1½x⅛



TYPICAL FLOOR SECTION



The Aerocrete Compound, packed for each job in individual bags, is added directly to the aggregate.

AEROCRETE

LIGHTWEIGHT CONCRETE

SECTION 3

CONTINUED ⟶

CONCRETE PLANK CO., INC.

Manufacturers of Light Weight Tongue and Groove Concrete Plank

TELEPHONE
Bergen 4-1401

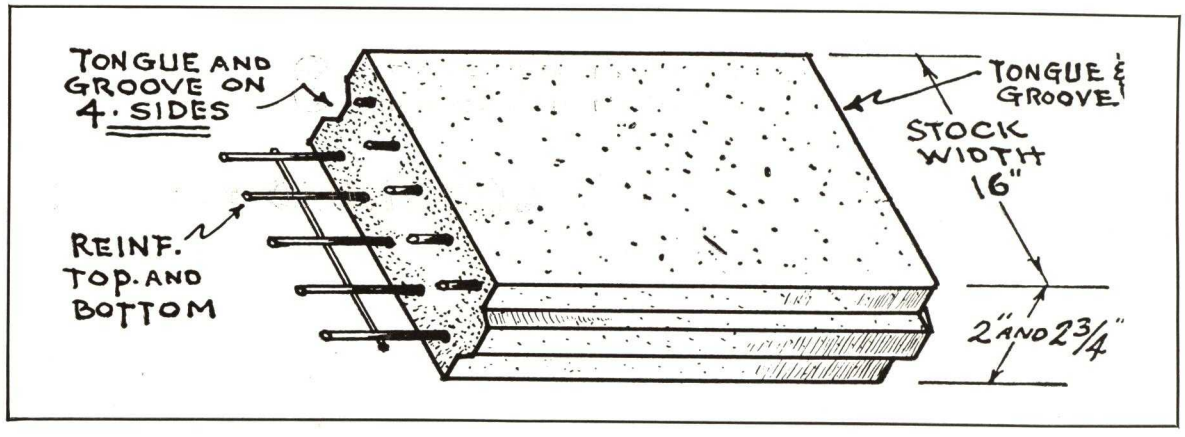
50 Sussex Street, JERSEY CITY, N. J.

CANTILITE

Nailable Light Weight Tongue and Groove Concrete Plank for Roofs and Floors

Cantilite is an exceptionally strong but light-weight plank that does not warp. It has no exposed metal and it is easily cut in the field to meet special conditions. It is readily nailed to wood—or laid and clipped on steel structure.

Cantilite is composed of cellular Portland cement concrete and steel—factory moulded in steel forms to give an absolutely smooth level surface on both sides. The plank has tongue and groove construction on all edges. It is reinforced by two courses of welded galvanized steel wire rods embedded near top and bottom. The plank is nailable.



Advantages of Cantilite Concrete Plank

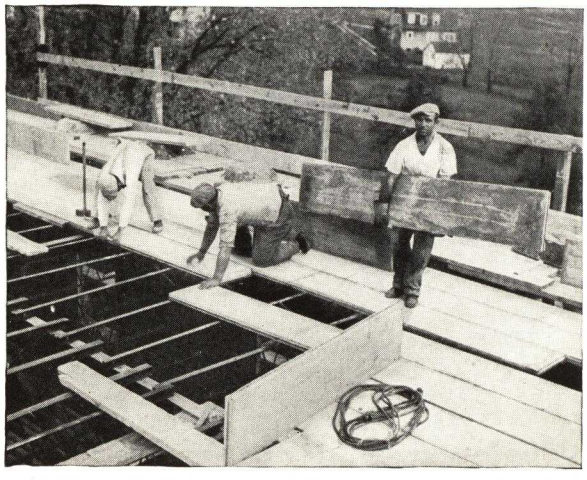
Due to the strength developed by the tongue and groove construction and the double steel reinforcement, Cantilite can be laid regardless of spacing of supports. The planks cantilever over the supports and produce a continuity of action that develops great strength. Then, too, the tongue and groove locked joints, when laid, are grouted with Portland cement; this binds the planks into a monolithic unit.

The smooth finish of the Cantilite surfaces permits direct application of stuck-down type floorings.

The light weight of Cantilite makes possible a support of lighter steel—and, consequently, reduces structure cost.

Cantilite speeds up erection. Several thousand square feet can be laid in a day. Working service can be started immediately—without the usual wait for concrete setting. And either side of Cantilite can be placed up.

Cantilite can be laid in any weather condition; it is unaffected by rain or hot or sub-zero temperature.



Laying Cantilite Concrete Plank in the Roosevelt School, Ossining, N. Y.

Sizes and Weights

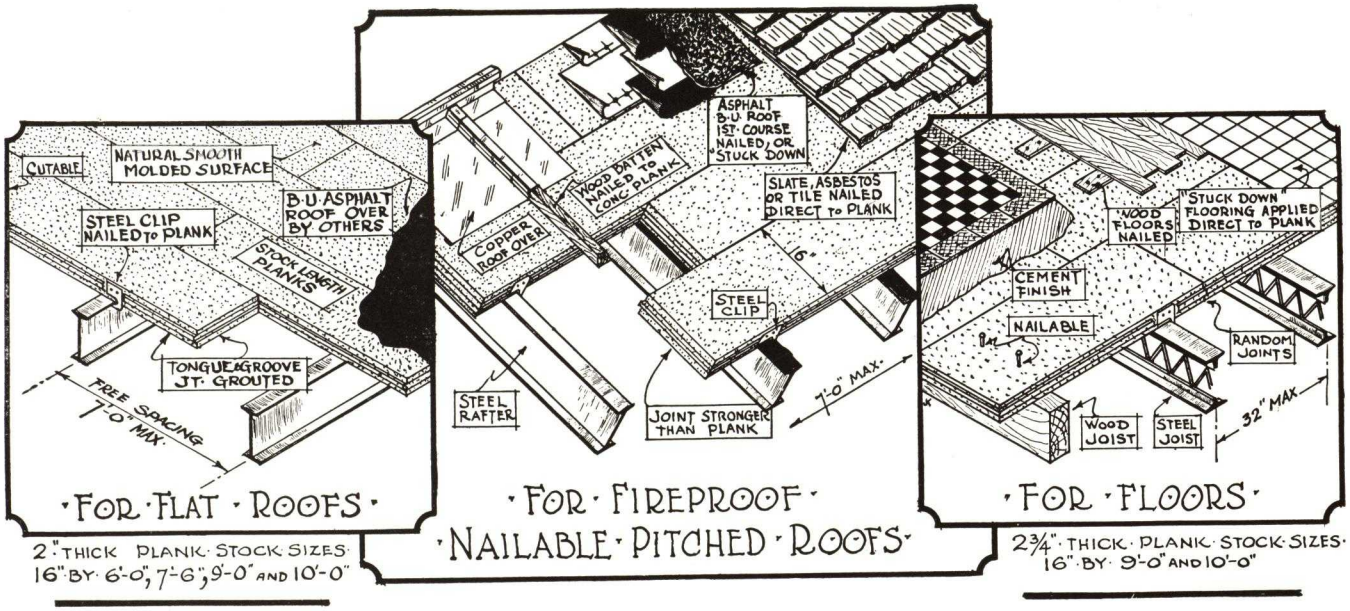
Cantilite is made 16 in. wide and in two thicknesses:

2 Inches Thick—In 6, 7½, 9 and 10-ft. lengths; 12 lbs. per sq. ft.

2¾ Inches—In 9 and 10-ft. lengths for long spans; 17 lbs. per sq. ft.

Strength

The strength of Cantilite in various lengths is shown in the table on the following page.



·FOR·FLAT·ROOFS·

2"·THICK·PLANK·STOCK·SIZES·
16"·BY·6'-0", 7'-6", 9'-0"·AND·10'-0"

·FOR·FIREPROOF·
·NAILABLE·PITCHED·ROOFS·

·FOR·FLOORS·

2¾"·THICK·PLANK·STOCK·SIZES·
16"·BY·9'-0"·AND·10'-0"

OFFICIAL TEST LOADINGS OF CANTILITE*

2-In. Thick Cantilite					2¾-In. Thick Cantilite				
Where used	Clear span, ft. in.	Plank weight, lbs. per sq. ft.	Breaking load lbs. per sq. ft.	Eng. std. safety factor of 4 lbs.	Where used	Clear span, ft. in.	Plank weight, lbs. per sq. ft.	Breaking load lbs. per sq. ft.	Eng. std. safety factor of 4 lbs.
On Roofs (pitched and flat)	7–0 6–0 5–0	12 12 12	240 330 460	60 82 110	On Roofs (pitched and flat)	8–0 7–0 6–0	17 17 17	240 320 440	60 80 110
On Roofs or Floors	4–0	12	560	140	Floors or Roof	5–0	17	680	170
On Floors	2–8 2–0	12 12	915 1360	229 340					

*Copies of official tests sent on request.

Specifications

Material—The roofs and (or) floors to be constructed with Cantilite Concrete Plank as manufactured and erected by CONCRETE PLANK CO., INC., 50 Sussex Street, Jersey City, N. J.

The plank are to be composed of lightweight concrete; tongue and groove edges; surfaces to be molded smooth and level with galvanized steel reinforcement at top and bottom. Plank shall be so designed and of such length to permit free spacing of supports.

The plank shall be nailable with standard roofing nails and of sufficient hardness to hold the nails to the satisfaction of the architect. Also to be of such texture that they may be cut or sawed, as applied, to fit exceptional conditions.

Plank are to be 2 in. thick and to weigh approximately 12 lbs. per sq. ft. (OR) Plank are to be 2¾ in. thick and to weigh approximately 17 lbs. per sq. ft.

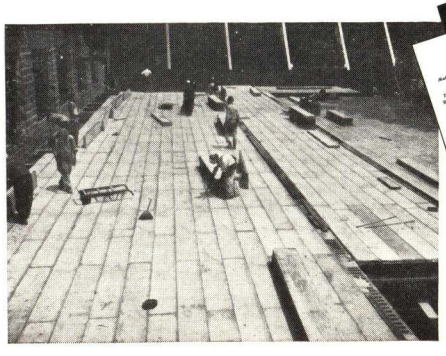
Erection—The plank are to be fastened to purlins, beams or rafters with galvanized metal clips firmly nailed to the plank; or when supported on wood, by nails driven through the plank.

The top surface of floors and flat or near flat roofs shall be grouted with Portland cement grout before any other trades are permitted to work thereon.

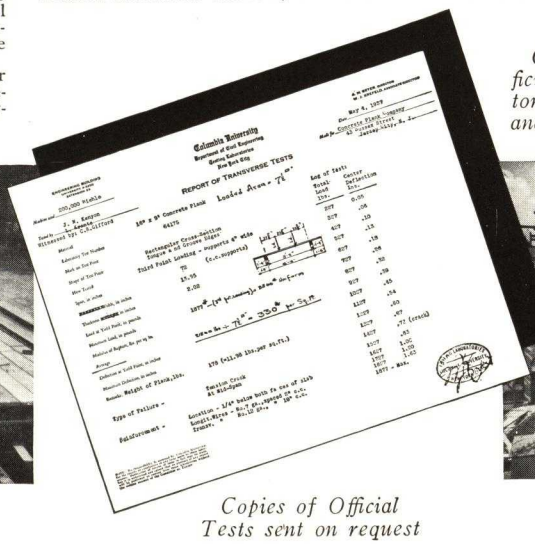
A Few Recent Contracts and Installations

JOB AND LOCATION	ARCHITECT	CONTRACTOR
Brevoort Farms, Inc., Rye, N. Y.	Walker & Gillette	Wintour J. Hackett
Bridgeport Brass Co., Bridgeport, Conn.	Fletcher-Thompson, Inc.	Hewlett Constr. Co.
Choate School, Wallingford, Conn.	Charles F. Fuller	The Choate School
Christian Bros. Academy, Albany, N. Y.	Jas. W. O'Connor	John P. Sewell
Cibo Pharmaceutical Prod., Summit, N. J.	J. Floyd Yewell	Walter Kidde Constr. Co.
Hartsdale School, Hartsdale, N. Y.	Adolph Knappe	Jos. Bisceglia & Son
Hofstra College, Hempstead, N. Y.	Aymar Embury	Estabrook Constr. Co.
Jersey Ctl. P. & Light Co., Morristown, N. J.	Ernest Arend	J. N. Bearmore & Co., Inc.
Marlboro Hospitals (5), Marlboro, N. J.	Dept. of Institutions	Pellachia Constr. Co. and A. A. LaFountain, Inc.
Morristown Armory, Morristown, N. J.	Hugh A. Kelly	A. A. LaFountain, Inc.
New Rochelle Hospital, New Rochelle, N. Y.	Shreve, Lamb & Harmon	Fanelli & Pisani Corp.
New York University, New York	Wm. S. Gregory	John Lowry, Inc.
108th Field Artillery Armory, Philadelphia	H. Stanley Atkinson	F. W. Mark
Smithtown Branch School, Smithtown, N. Y.	Wilson & Rahm	A. J. Paretta Constr. Co.
Stevens Institute, Hoboken, N. J.	Harold G. Webb	Hegeman-Harris Co., Inc.
Tidewater Oil Co., Bayonne, N. J.	Tidewater Staff	The Austin Co.
Worthington P. & Mchy. Co., Harrison, N. J.	Wigton-Abbott Corp.	Wigton-Abbott Corp.
Alwyn Court Apartments, New York	Louis S. Weeks	Ellinger Const. Co.
Blessed Sacrament Convent, New York	Henry J. McGill	Chapman Kruge Engr. Co.

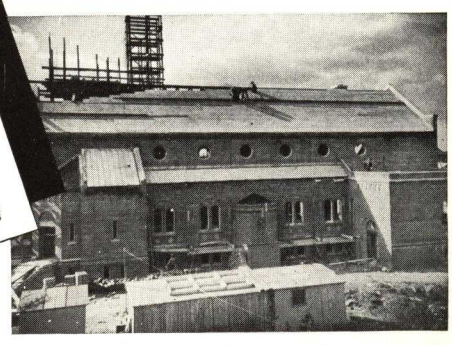
Complete information, and copies of official tests conducted by Testing Laboratories on request. Also recommendations and estimates for individual jobs.



For Floors

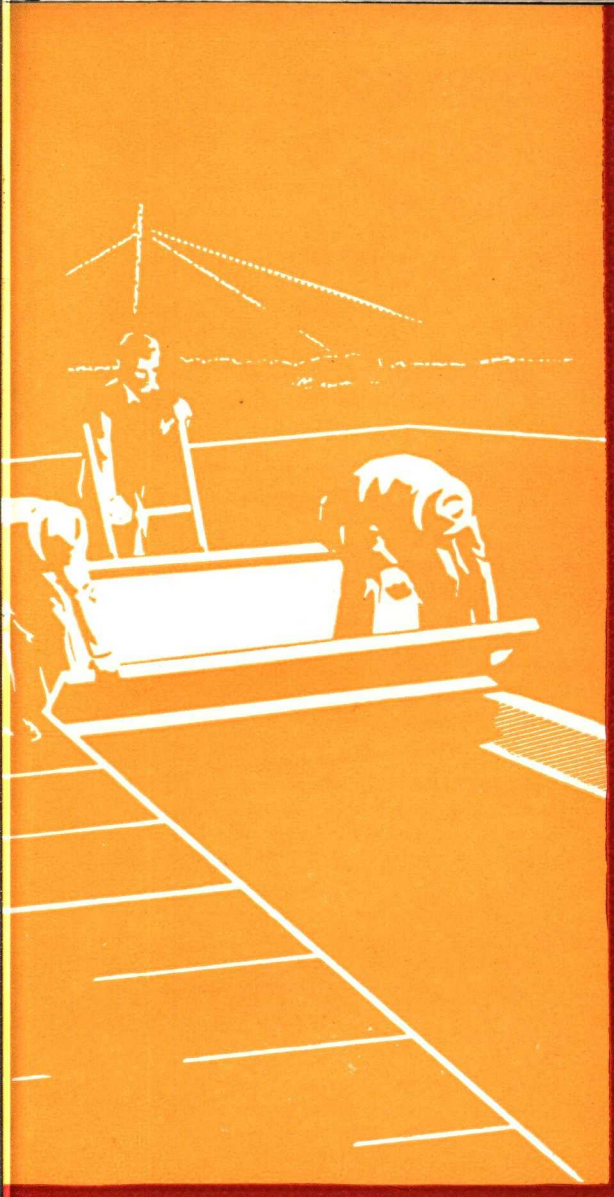


Copies of Official Tests sent on request



For Flat or Sloping Roofs

MEMORANDA



Featherweight CONCRETE INSULATING ROOF SLABS

FEDERAL-AMERICAN CEMENT TILE CO.

CHICAGO • ILLINOIS

CATALOG 103
ROOF STANDARDS ★

FEDERAL-AMERICAN CEMENT TILE CO.

Featherweight Precast Concrete Roof Slabs

Executive Offices: 608 SOUTH DEARBORN STREET, CHICAGO, ILL.

Plants near: CHICAGO - NEW YORK - PITTSBURGH - BIRMINGHAM - Sales Offices in all Principal Cities

THE ROOF FOR PERMANENCE

Featherweight Roof Slabs are Precast of Haydite aggregate, are unusually light in weight, strong, and possess insulating value unique in concrete. They represent the latest development in permanent, fireproof, no-maintenance roof construction.

They are manufactured in our own four modern strategically located plants where conditions for mixing and casting concrete are ideal. Temperature and moisture as well as all other factors are held under strict control at all seasons of the year. A scientifically proportioned mix is placed in a rigid steel mold with the steel reinforcing mechanically held in its proper position. The form is then vibrated at the rate of 2500 blows per minute, giving a strong, dense, impervious concrete. Vibration also imparts a smooth underfinish to the slab, producing an attractive ceiling effect of natural cement color. No painting is necessary.

A ***Featherweight*** Precast Concrete Roof is laid on the same light steel frame that supports other roofs. The slabs carry a load well above all building code requirements. It is a low cost permanent roof deck. **Over two hundred and fifty million square feet are in use today.**

One of the following roof slabs will meet your roof deck requirement.

***FEATHERWEIGHT* CONCRETE CHANNEL ROOF SLABS**—Used for flat or sloping roofs. Composition covering is required. See details on pages 4 to 8.

***FEATHERWEIGHT* NAILING CONCRETE SLABS**—A concrete roof deck to which slate, ornamental tile, copper or other roofing can be directly nailed. See details on pages 9 and 10.

***FEATHERWEIGHT* CONCRETE INTERLOCKING SLABS**—A complete waterproof roof eliminating all composition covering. For roofs of not less than 1/6 pitch. See details on pages 11 to 13.

***FEATHERWEIGHT* GLASS INSERT SLABS**—Used in combination with Interlocking Slabs for top lighting. The ¼ x 21 x 35 in. wire glass insert is embedded in the concrete during manufacture. See details on page 11.

SERVICE AND STRUCTURAL DETAILS—Our engineers will gladly suggest the most economical layout of both steel and slabs without charge or obligation. "Catalog and Roof Standards" will be sent on request.

STANDARD SPECIFICATIONS

FEATHERWEIGHT* CONCRETE CHANNEL ROOF SLABS**—The roof decks shall be precast ***Featherweight Concrete Insulating Channel Slabs 2¾" deep for spans up to 6' 4" and 3½" deep or more for longer spans. The web thickness shall be a full one inch, composed of an approved brand of portland cement and the highest grade Haydite aggregate accurately graded and thoroughly mixed and vibrated so as to obtain the greatest possible density. Each leg shall be reinforced with one deformed bar accurately centered so as to have at least one-half inch of dense, impervious concrete on all sides. The web of the slab shall be reinforced with a sheet of galvanized welded wire mesh accurately placed.

All joints of the channel slabs shall be cemented on the upper side with an approved brand of asphaltic cement and the finished deck shall present a smooth surface ready for the application of the composition covering.

All slabs shall carry not less than 250 pounds per square foot, ultimate load uniformly distributed when resting on supports spaced the same as the purlins.

No warped, cracked or broken slabs shall be placed in the roof. All slabs shall be as nearly perfect as good workmanship will permit.

All slabs shall be natural water and air cured under cover at a constant temperature of not less than 65° F.

This contractor shall submit details based on the steel fabricator's shop drawings as well as the architect's drawings for approval before proceeding with manufacture.

All slabs shall be erected by or under the supervision of the manufacturer in a thorough, workmanlike manner.

FEATHERWEIGHT* NAILING CONCRETE ROOF SLABS**—Where specified, the roof decks shall be precast ***Featherweight NAILING Concrete Flat Slabs of Haydite aggregate designed for the spans shown, with a top section of 1¼" of Nailing Concrete cast integral with the ***Featherweight*** concrete bottom section.

Each slab shall be reinforced with a sheet of galvanized cold drawn wire mesh accurately placed in the slab. The longitudinal wires shall be spaced not more than 1⅜" apart and cross wires not more than 2" apart woven around the longitudinal wires.

All slabs shall carry not less than 250 pounds per square foot ultimate load uniformly distributed when resting on supports spaced the same as the purlins.

All slabs shall be as nearly perfect as good workmanship will permit. No cracked, broken or warped slabs shall be placed in the roof.

All slabs shall be natural water and air cured under cover at a constant temperature of not less than 65° F.

This contractor shall submit details based on the steel fabricator's shop drawings as well as the architect's drawings for approval before proceeding with manufacture.

All slabs shall be erected by or under the supervision of the manufacturer, in a thorough, workmanlike manner.

FEATHERWEIGHT* INTERLOCKING AND GLASS INSERT SLABS**—Where specified, sloping roofs shall be ***Featherweight Reinforced Concrete Interlocking Slabs, the exposed surface of which is to present a smooth, permanent, red finish, and this color to penetrate the top one-half of the slab.

Each slab shall be reinforced with a sheet of galvanized cold drawn wire mesh accurately centered in the slab. The longitudinal wires shall be spaced not more than 1⅜" apart and cross wires not more than 2" apart woven around the longitudinal wires.

The longitudinal joints shall be cemented with a high grade oil cement and a weather cap coat of highest grade elastic compound. The lap or cross joint shall be a squeeze joint of high grade oil cement.

All trimmings, such as ridge roll, flashing slabs, finishing slabs, sawtooth ridges and ventilator collar slabs of the same specification as above, shall be furnished as shown on the drawings.

All slabs shall carry not less than 250 pounds per square foot ultimate load uniformly distributed when resting on supports spaced the same as the purlins.

All slabs shall be as nearly perfect as good workmanship will permit. No cracked, broken or warped slabs shall be placed in the roof.

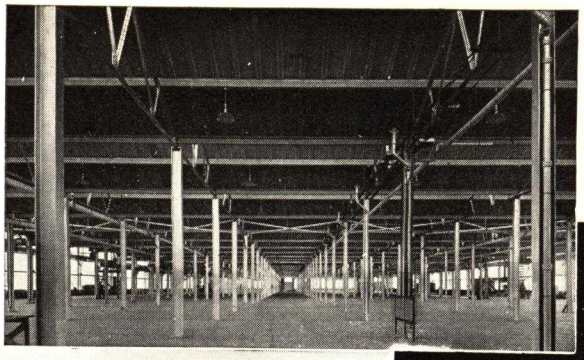
All slabs shall be natural water and air cured under cover at a constant temperature of not less than 65° F.

This contractor shall submit details based on the steel fabricator's shop drawings as well as the architect's drawing for approval before proceeding with manufacture.

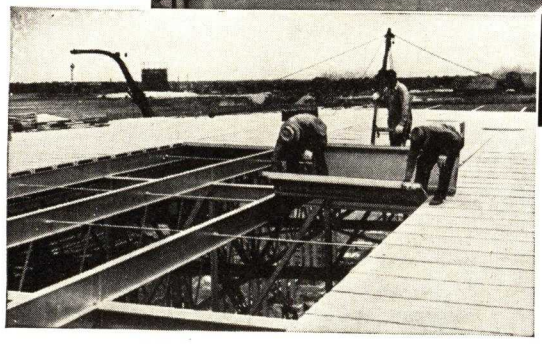
All slabs shall be erected by or under the supervision of the manufacturer in a thorough, workmanlike manner.

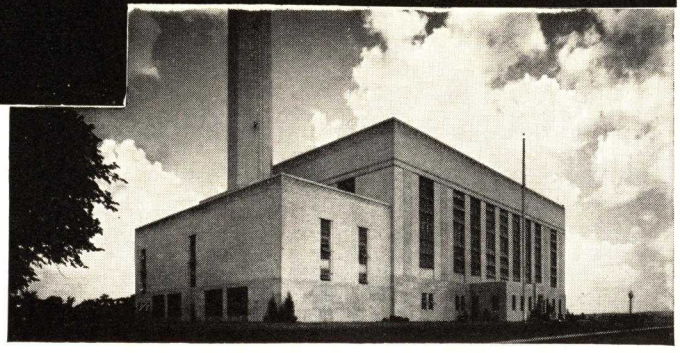
Where specified, top lighting shall be provided by Interlocking Slabs with ¼" x 21" x 35" wire glass inserts. Locate as shown on drawings.

TYPICAL INSTALLATIONS

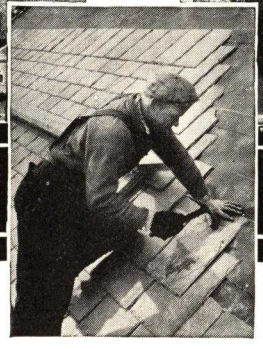


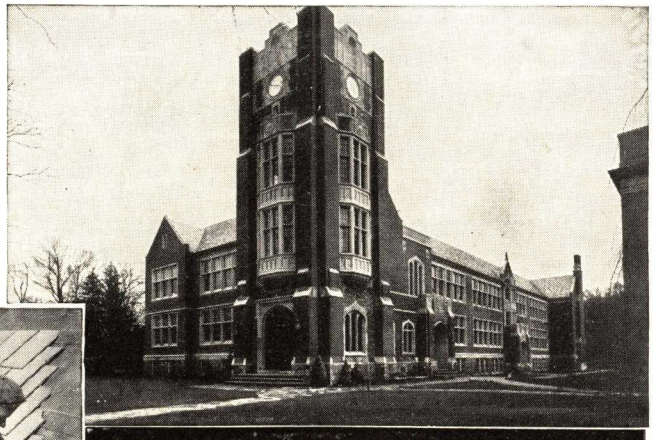
Featherweight PRECAST CONCRETE CHANNEL SLABS





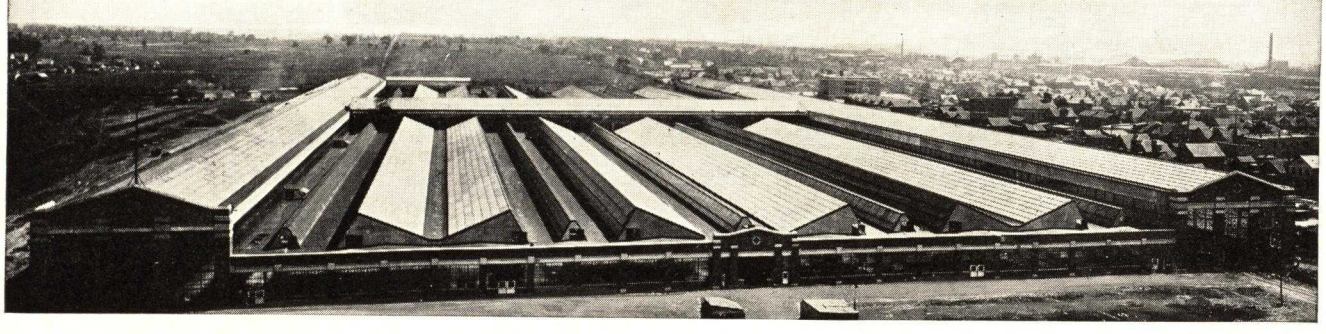
Featherweight





NAILING CONCRETE SLABS

Featherweight CONCRETE INTERLOCKING SLABS

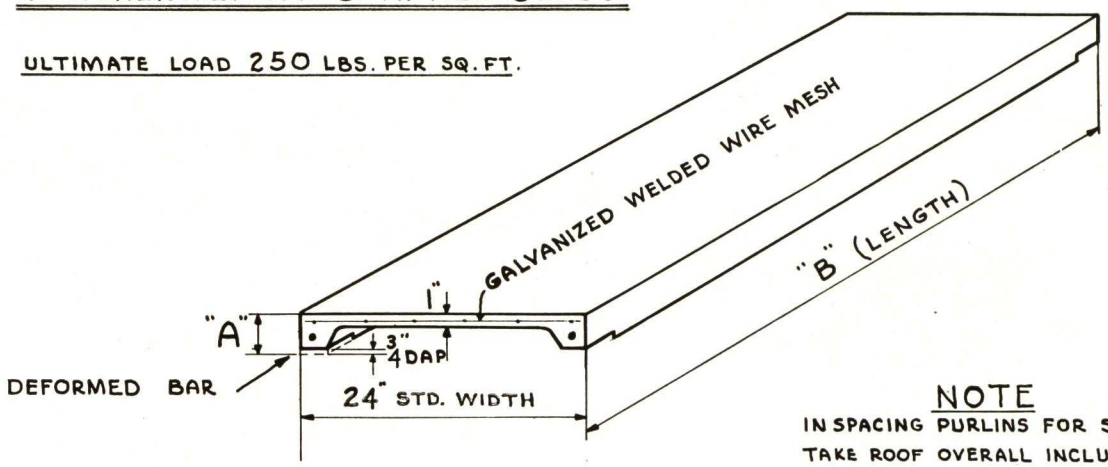


FEDERAL-AMERICAN CEMENT TILE CO. - CHICAGO

CHANNEL SLAB DETAILS

FEATHERWEIGHT CHANNEL SLABS

ULTIMATE LOAD 250 LBS. PER SQ. FT.

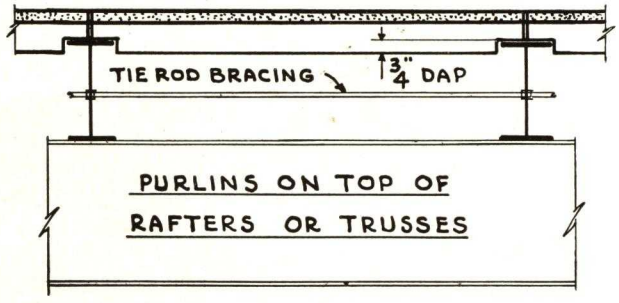


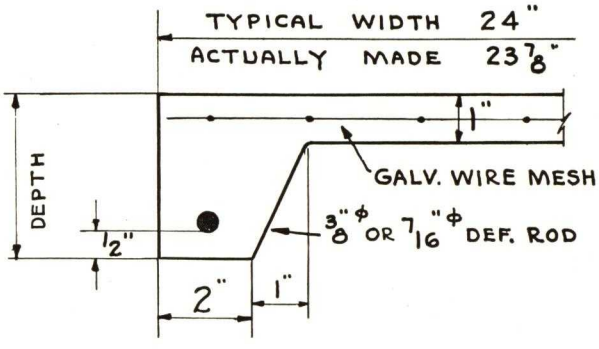
"A" DEPTH	"B" LENGTH	MAXIMUM LENGTH	WEIGHT PER SQ. FT.
2 3/4"	SEE NOTE	6'-4"	10 LBS.
3 1/2"	SEE NOTE	8'-4"	12 LBS.

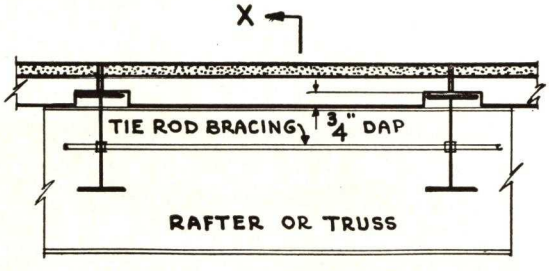
SLABS CAN BE FURNISHED FOR SPECIAL CONDITIONS

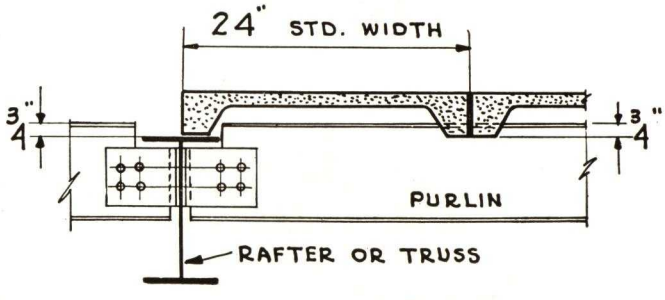
NOTE

IN SPACING PURLINS FOR SLABS TAKE ROOF OVERALL INCLUDING OVERHANG EQUALIZING SLAB LENGTHS. LENGTHS TO 6'-4" USE 2 3/4" DEPTH. LENGTHS OVER 6'-4" USE 3 1/2" DEPTH. AVOID COMBINATION OF BOTH DEPTH SLABS TOGETHER.





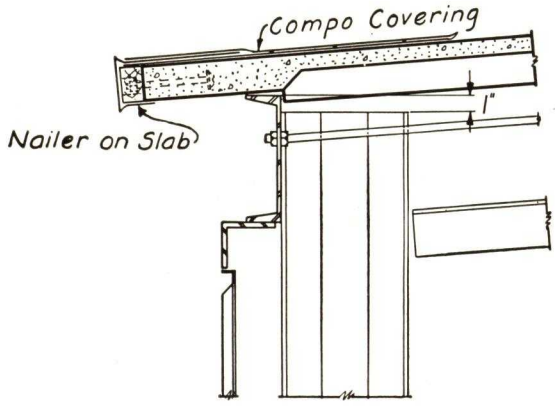


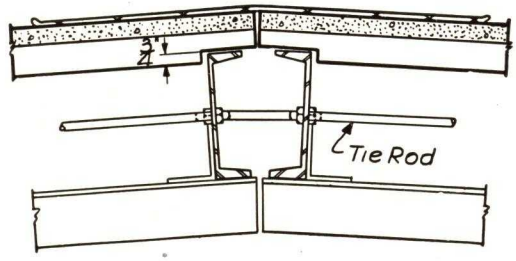


SECTION "X-X"

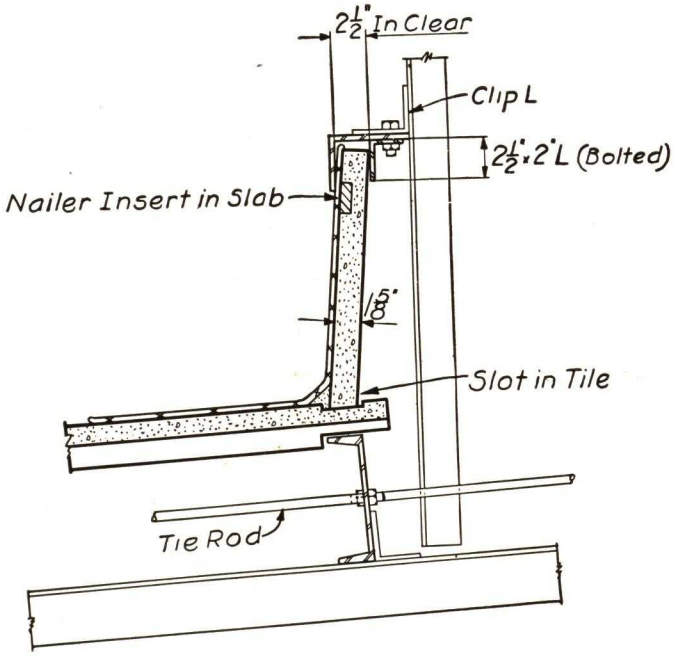
WHEN PURLINS FRAME TO RAFTERS OR TRUSSES
PLACE TOP OF PURLINS 3/4" ABOVE
(RAFTER ALSO USED FOR SLAB SUPPORT)

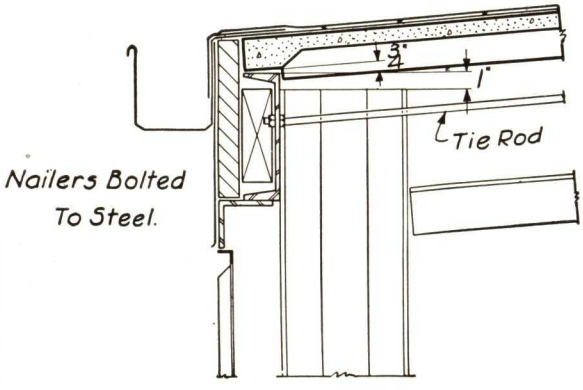
CHANNEL SLAB DETAILS

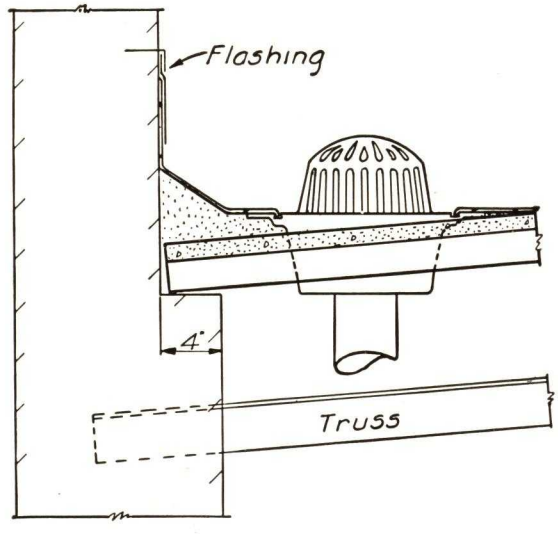


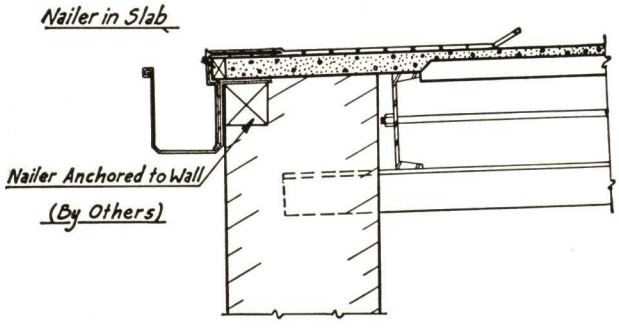


Note Stop Cols 1" Below Top of Purlins
Slabs Notched 3/4" for Locking

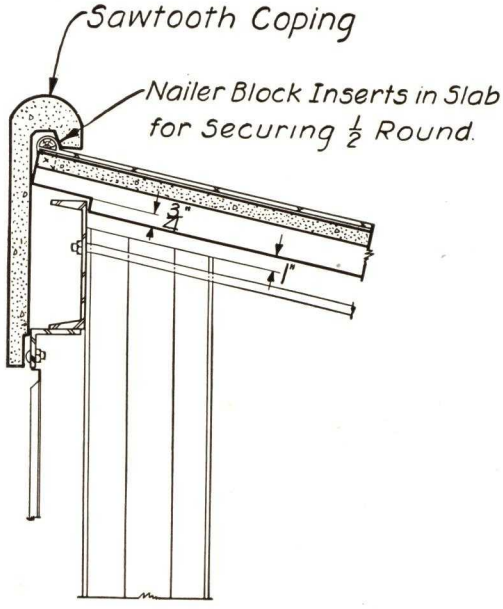


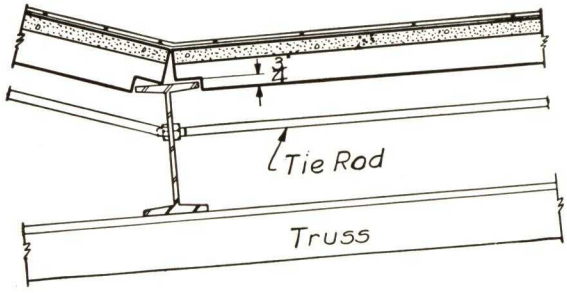


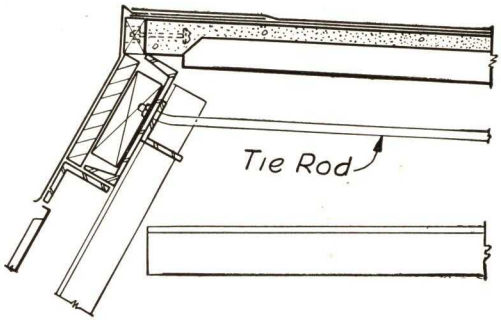


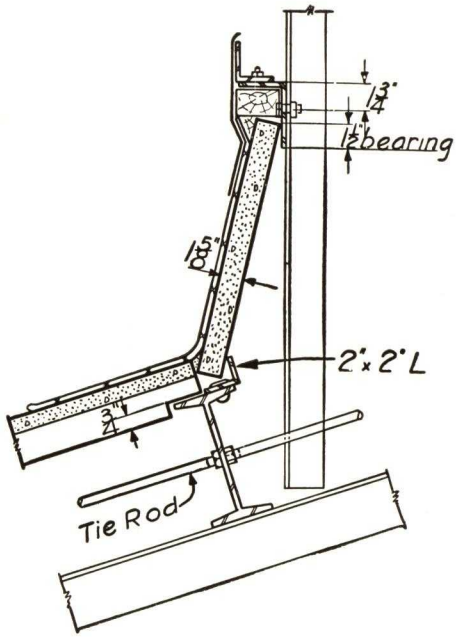


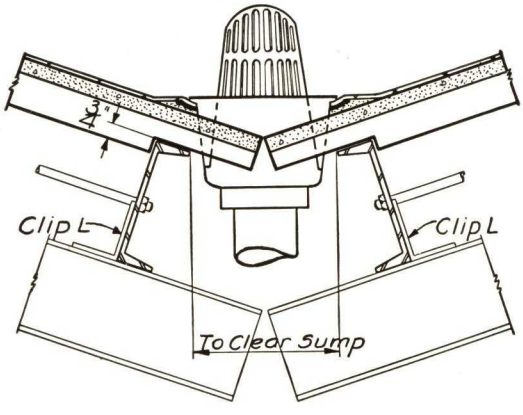
CHANNEL SLAB DETAILS



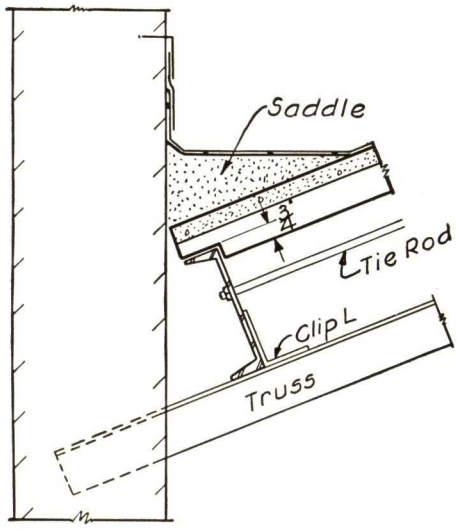




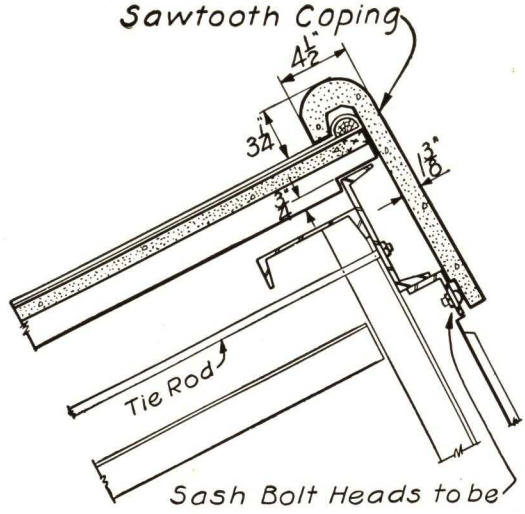




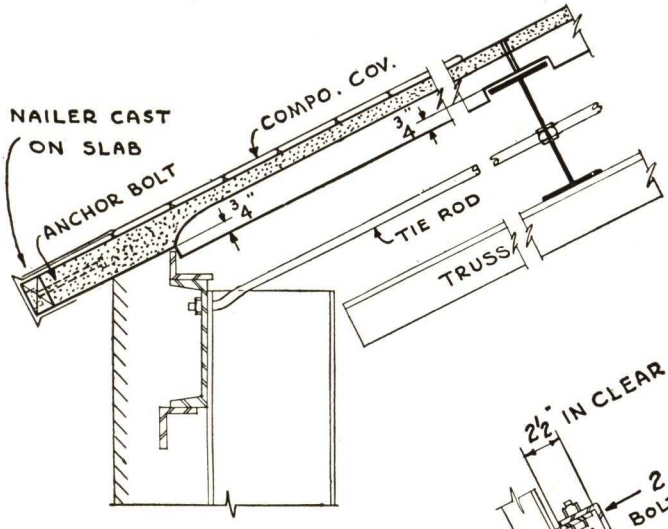
CHANNEL SLAB DETAILS

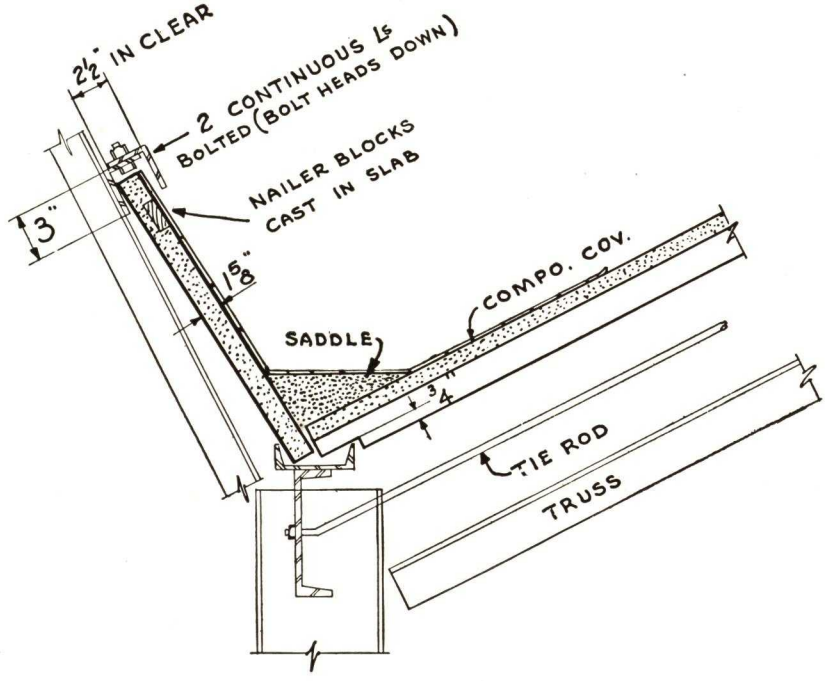


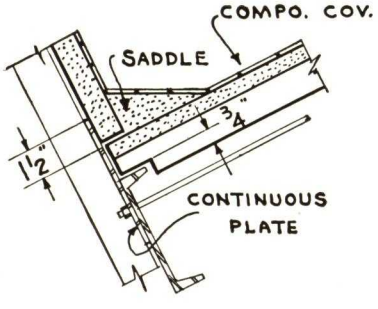
Brace Top Purlin against Pull down of Roof



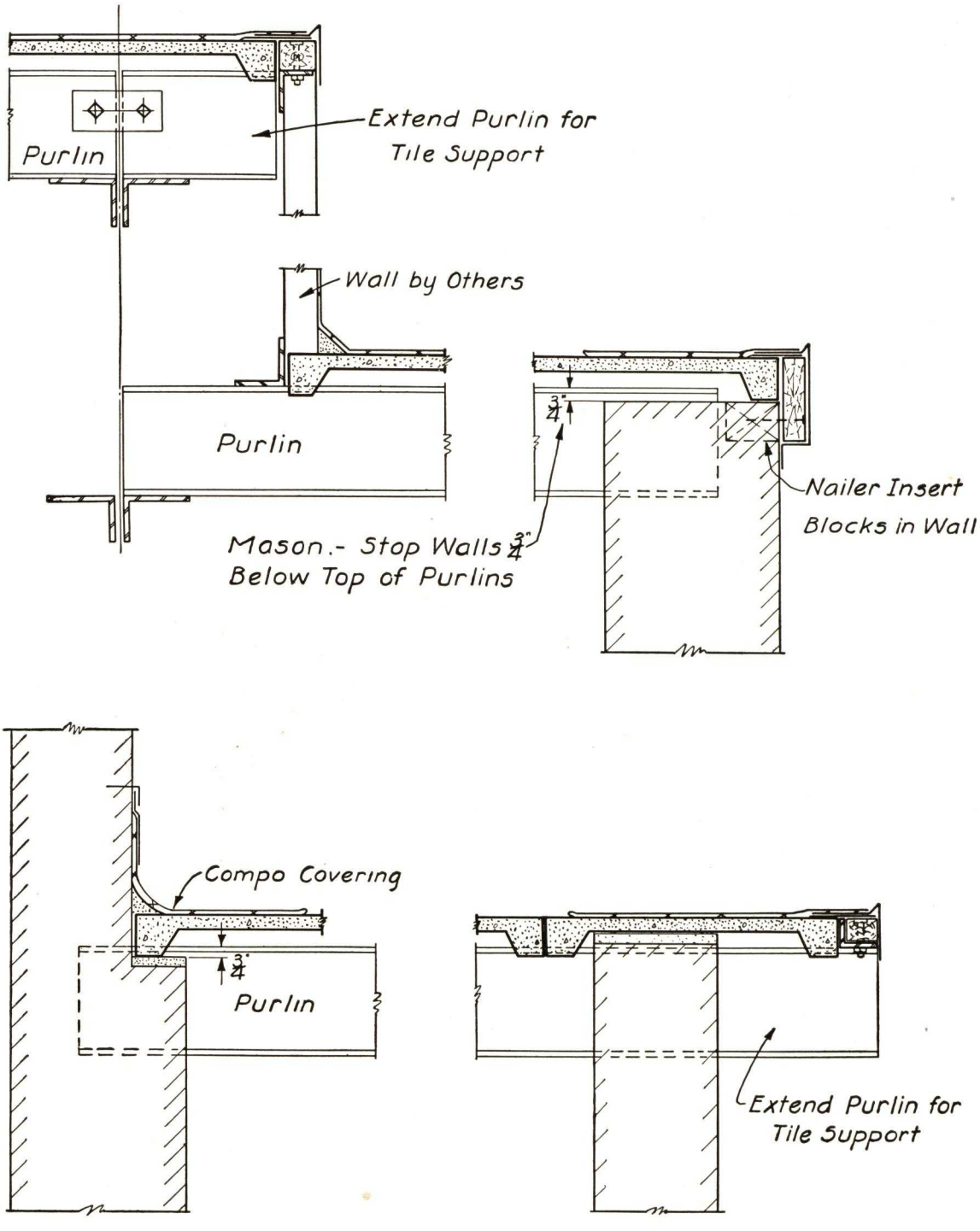
Sash Bolt Heads to be on Outside of L







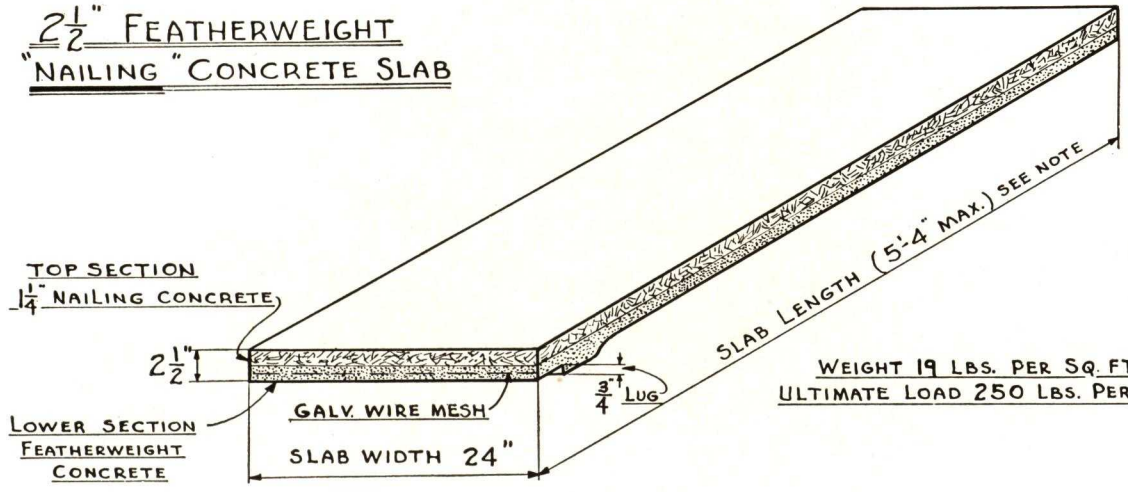
CHANNEL SLAB DETAILS



GABLE END DETAILS

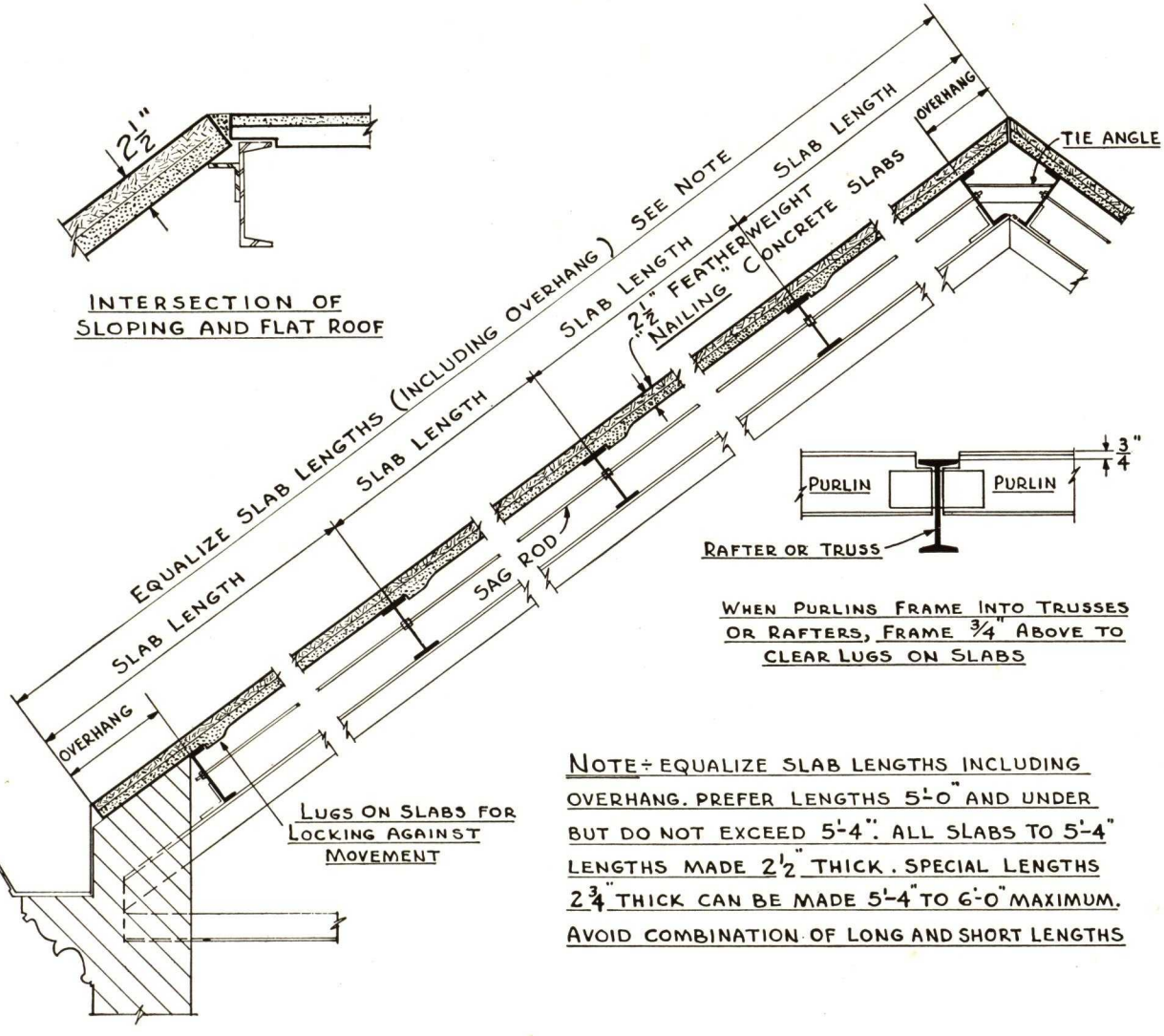
NAILING CONCRETE SLAB DETAILS

2½" FEATHERWEIGHT "NAILING" CONCRETE SLAB



WEIGHT 19 LBS. PER SQ. FT.
ULTIMATE LOAD 250 LBS. PER SQ. FT.

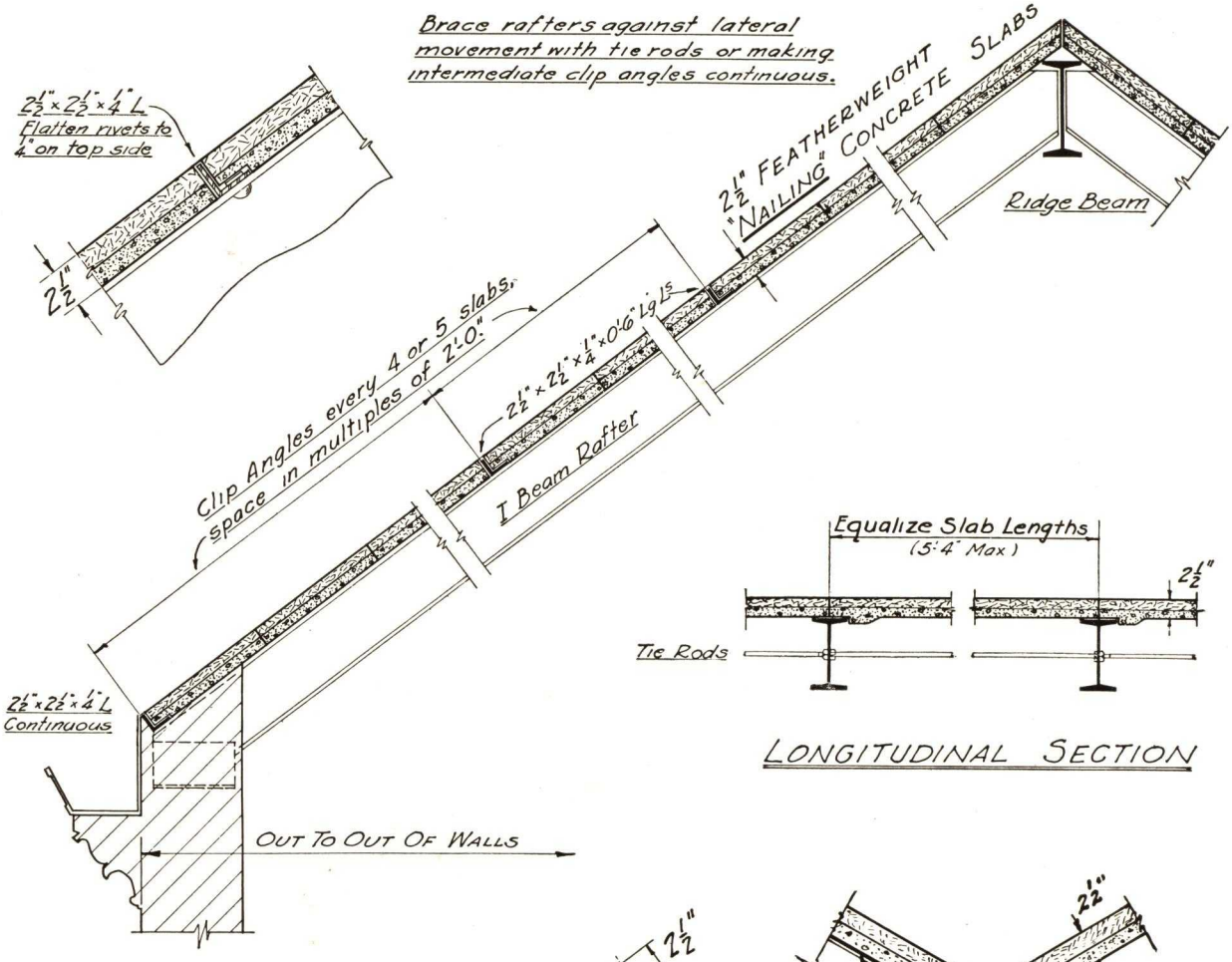
INTERSECTION OF SLOPING AND FLAT ROOF



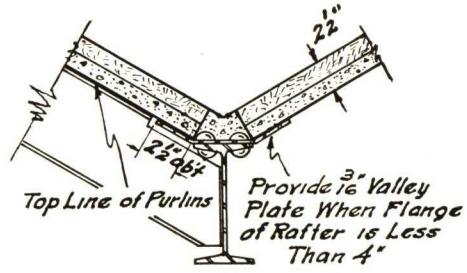
WHEN PURLINS FRAME INTO TRUSSES OR RAFTERS, FRAME ¾" ABOVE TO CLEAR LUGS ON SLABS

NOTE: EQUALIZE SLAB LENGTHS INCLUDING OVERHANG. PREFER LENGTHS 5'-0" AND UNDER BUT DO NOT EXCEED 5'-4". ALL SLABS TO 5'-4" LENGTHS MADE 2½" THICK. SPECIAL LENGTHS 2¾" THICK CAN BE MADE 5'-4" TO 6'-0" MAXIMUM. AVOID COMBINATION OF LONG AND SHORT LENGTHS

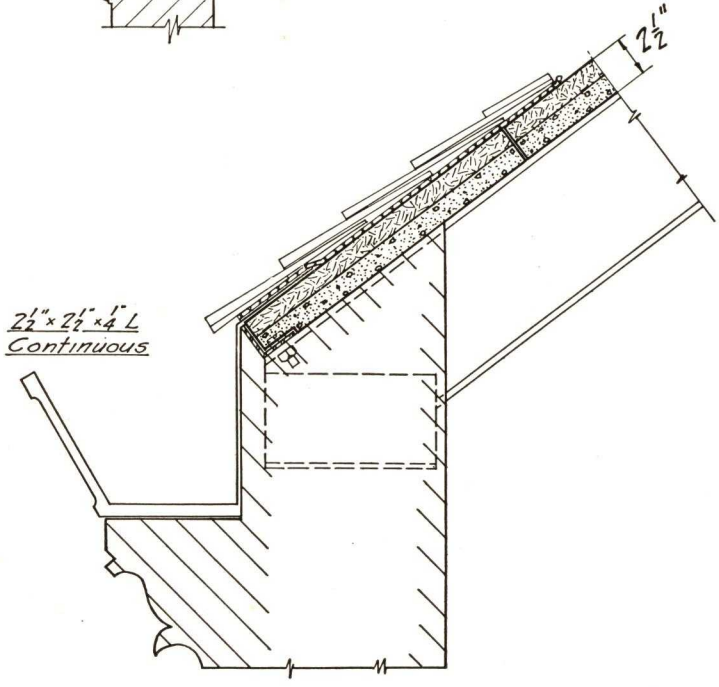
NAILING CONCRETE SLAB DETAILS

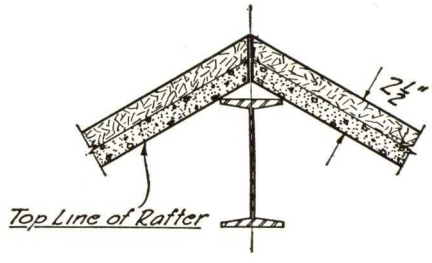


LONGITUDINAL SECTION



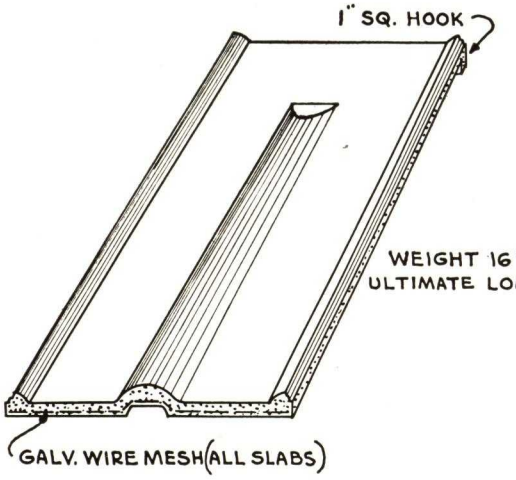
TYPICAL VALLEY SECTION

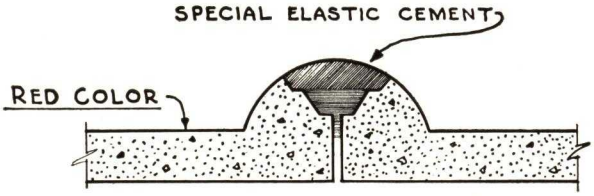




TYPICAL HIP SECTION

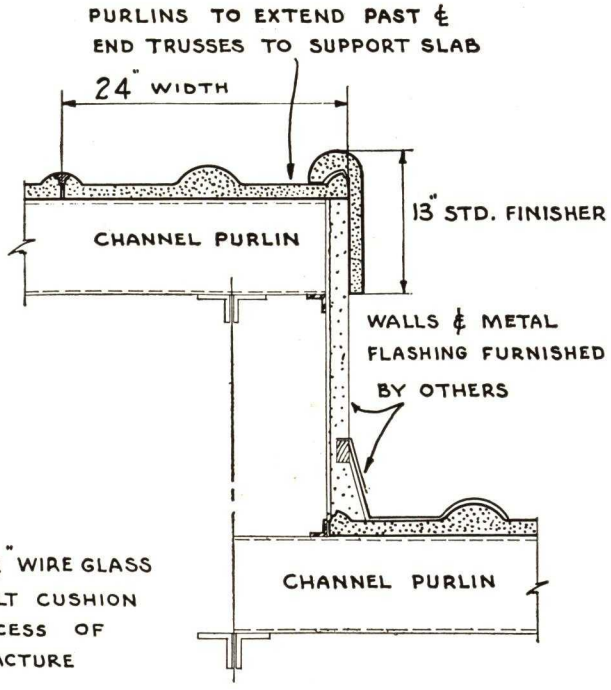
RED INTERLOCKING SLAB DETAILS

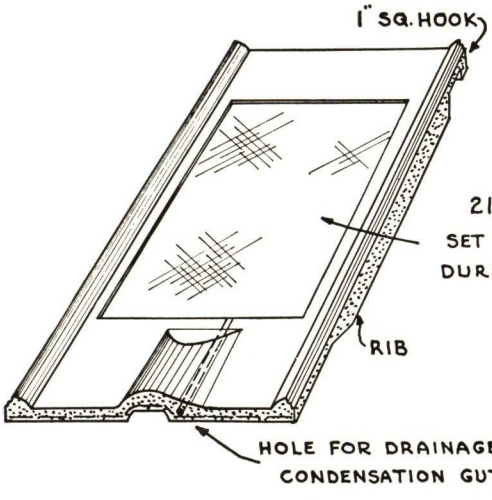




SECTION AT JOINT

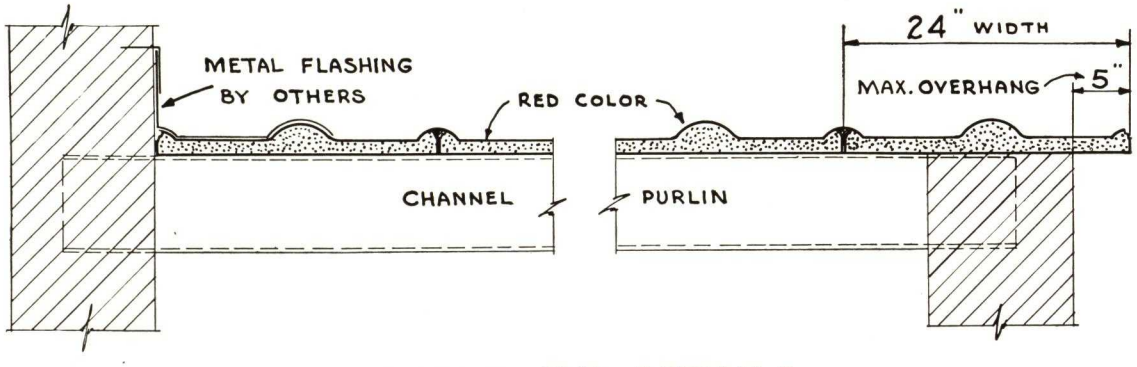
STD. SLAB 52" LONG - 24" WIDE - 1⅛" THICK
(SPACE ROOF PURLINS 3'-9" TO 4'-0½")
EXPOSED SURFACE OF SLABS AND TRIM
HARD WATERPROOF RED COLOR FINISH
(NO COMPOSITION COVERING REQUIRED)





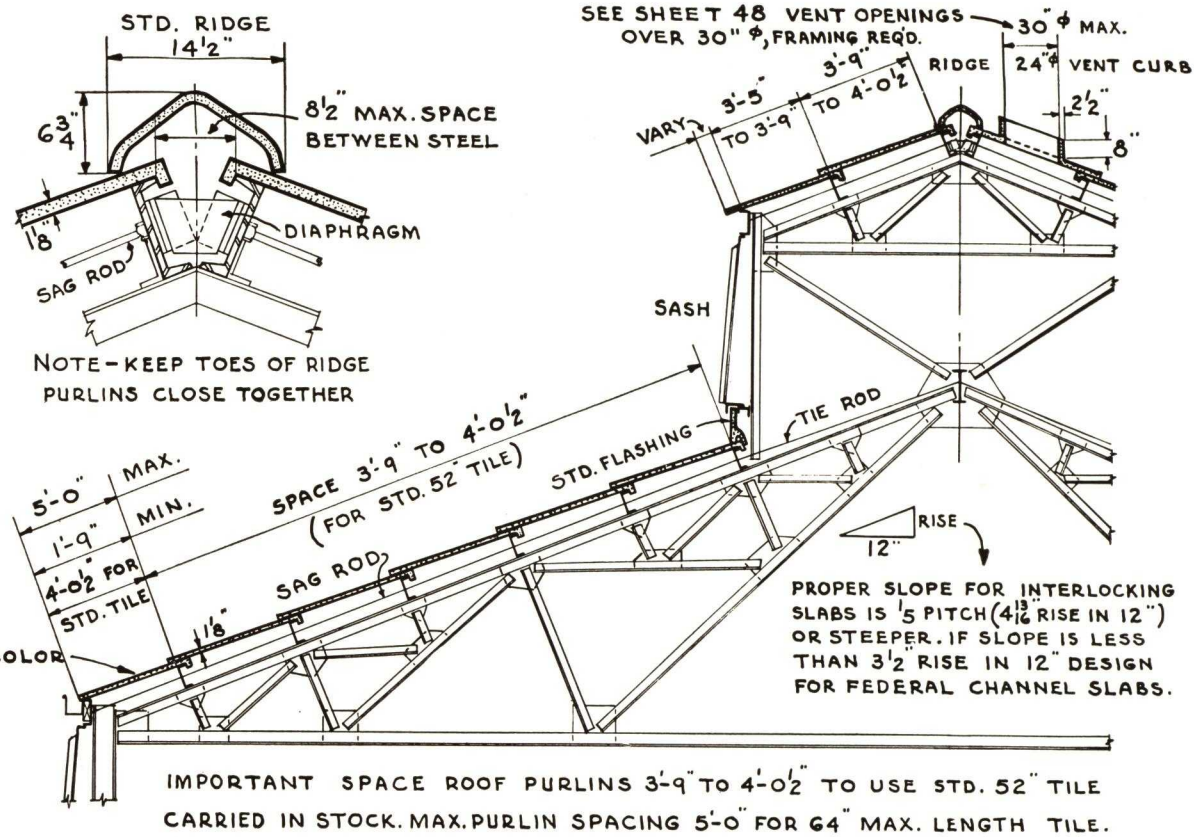
NOTE - METAL FLASHING
RECOMMENDED IN
SEPARATE SHEETS FOR
LENGTH OF SLAB.

STD. GLASS SLAB 52" LONG - 24" WIDE
(SPACE ROOF PURLINS 3'-9" TO 4'-0½")
(INTERCHANGEABLE WITH STD. SLABS)

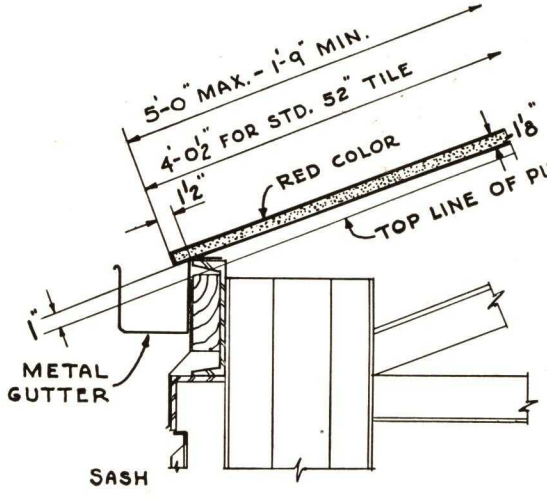


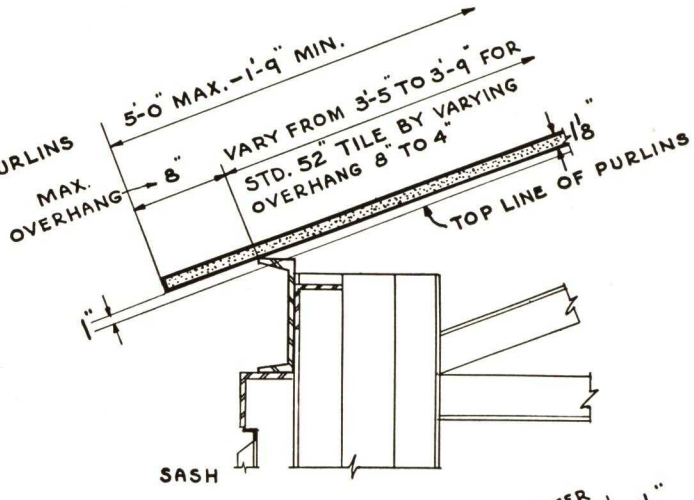
GABLE END DETAILS

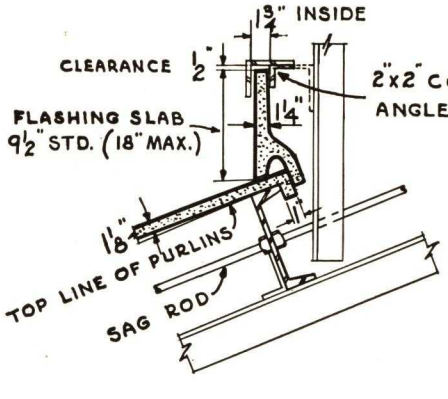
RED INTERLOCKING SLAB DETAILS

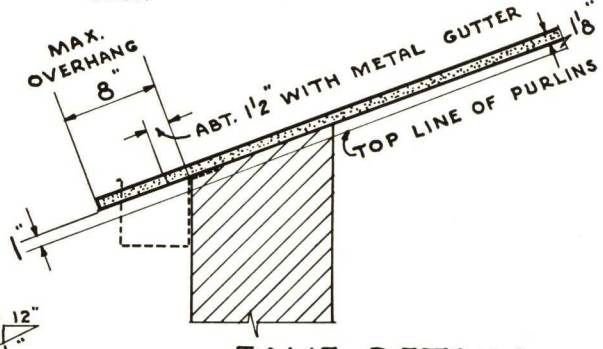


IMPORTANT SPACE ROOF PURLINS 3'-9" TO 4'-0½" TO USE STD. 52" TILE CARRIED IN STOCK. MAX. PURLIN SPACING 5'-0" FOR 64" MAX. LENGTH TILE.



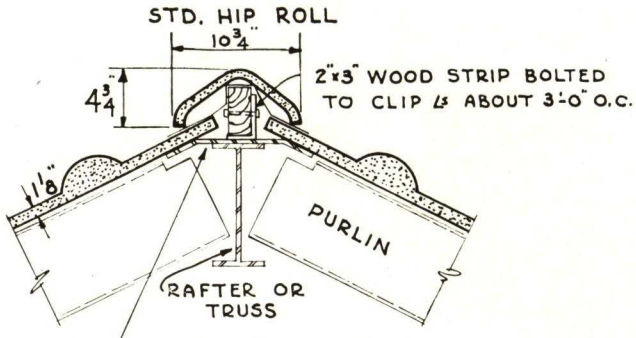




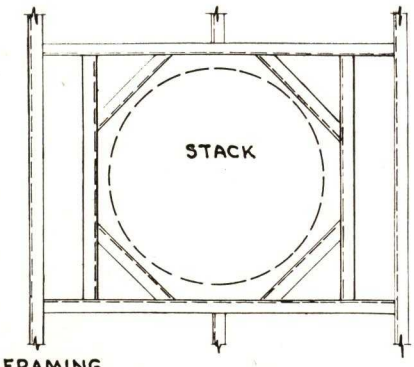


EAVE DETAILS

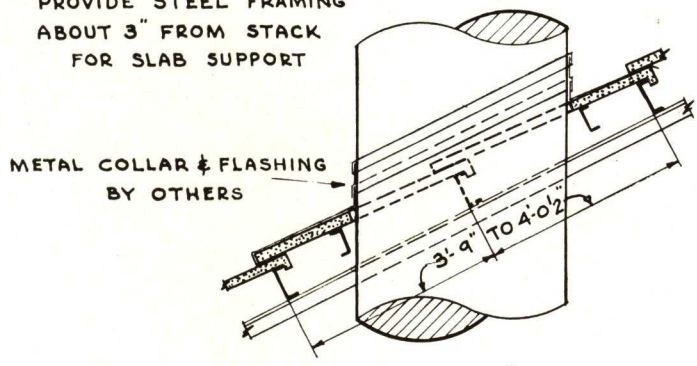
RED INTERLOCKING SLAB DETAILS



TYPICAL "HIP" SECTION

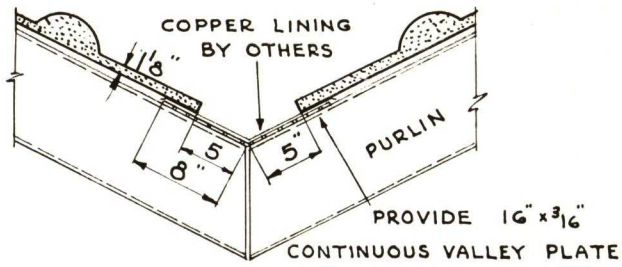


PROVIDE STEEL FRAMING ABOUT 3" FROM STACK FOR SLAB SUPPORT

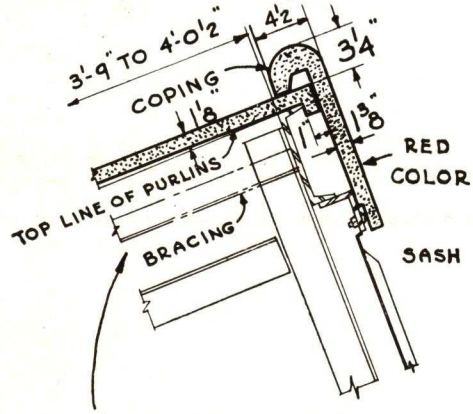


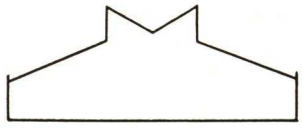
TYPICAL "STACK" FRAMING

LARGE VENTILATOR FRAMING SIMILAR

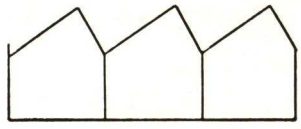


TYPICAL "VALLEY" SECTION



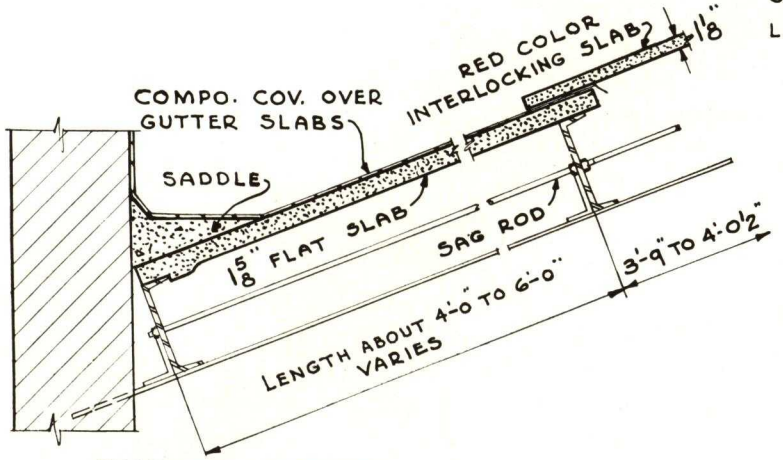


INVERTED MONITOR

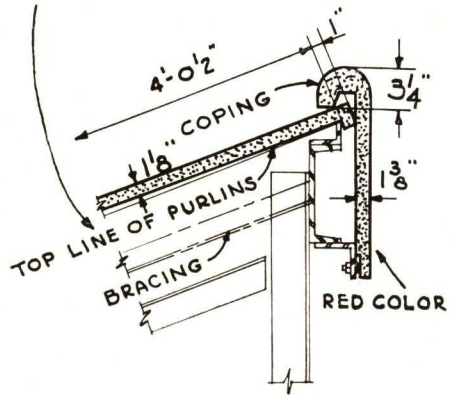


SAWTOOTH

SEE SHEET 39 FOR DETAIL OF LATTICE DIAGONAL BRACING



GUTTER DETAIL



SAWTOOTH COPING

FEDERAL-AMERICAN CEMENT TILE CO.

NATIONAL NAYLEGRIP COMPANY, INC.

Nailing Concrete Compounds, Cement Paint Base, Roof Slabs, Building Blocks

1721 Ash Street, ERIE, PA.

Products

NAYLEGRIP
NAILBOND
BONDO
ROOF SLABS
BUILDING BLOCKS

Naylegrip and Nailbond

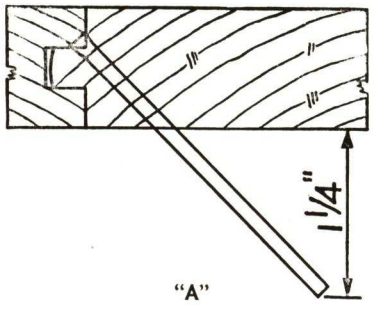
Years of scientific experimentation and further years of proven worth have established Naylegrip and Nailbond as ideal compositions for making permanent, efficient nailing concrete. Economy results from the fact that in purchasing either Naylegrip or Nailbond, you buy only one-fifth of the materials necessary for the concrete. The remainder is purchased at the nearest shipping point, a considerable saving in transportation costs.

Nailgrip Composition is made up of 90% pure mineral cementing substance, 10% vegetable substance. Combined with portland cement, a small amount of mason's sand, and cokebreeze (screenings or finer particles of commercial coke), it forms a perfect lightweight nailing concrete that readily receives nails and forms an increasingly firm bond with them. Fireproof, excellent for use with steel joist and rib lath or other suitable mesh.

Best used above grade, because of its porosity.

Nailbond Composition is a substance similar to Naylegrip and is ideal for use where cokebreeze is not obtainable. Mixed simply with mason's sand and portland cement to form Nailbond Concrete, it is a permanent nailing concrete of 600 to 900 lbs. compression. It is highly cementitious, makes a perfect bond with nails, and is not injurious to metals of any kind. It bonds well to a concrete sub-base and, poured on a well-tamped cinder bed, will lay clear and not settle into the cinders. Nailbond may be installed on metal lath and bar joist with very little waste.

Specifically recommended for ground floor installation.



Nailbond Installation Specifications

Nailbond Concrete on Ground Floors—Mix in a mechanical mixer one bag of Nailbond Composition with one bag of portland cement and 7 cu. ft. of washed mason's sand to a soft, plastic mixture. Install 3 in. of Nailbond Nailing Concrete (upon at least 4 in. of well tamped and tile drained cinders) to a level floated surface. Let cure under cover for at least 21 days, or until the surface is dry. Treat the surface with tar coating applied with a steel trowel, 2 gals. per 100 sq. ft. Apply a damp-proof paper directly upon the tar coating immediately after applying the tar coating. Flooring shall be nailed securely to the surface of the Nailing Concrete with 8d cut flooring nails spaced not more than 12 in. on centers and at an angle such that the point of the nails shall penetrate the Nailing Concrete to a depth of not less than 1¼ in. (See "A".)

Nailbond Concrete Above Grade on Bar Joist—Mixture same as above. Depth not less than 2 in. thick. For dampproofing, apply 1 gal. of tar coating to 75 sq. ft. of surface. Nailing: same, except nails may be spaced not more than 14 in. on centers.

Other Products

Bondo—Mixed half and half with water, Bondo forms a perfect bond coat for bonding new concrete floors to old ones.

Bondo Cement Paint—In combination with water and portland cement, Bondo forms a cement paint for waterproofing cement blocks, cinder blocks, concrete walls, tile, etc. If color is desired, oxide colors or pure mineral pigments may be added.

Roof Slabs — We manufacture lightweight precast fireproof roof slabs, either nailable, or non-nailable, for pitch or flat roof decks. Length, 5 ft. to 6 ft. 6 in., with shorter filler lengths. Width, 2 ft.; depth, 2½ in. Slabs are cured naturally, no chloride.

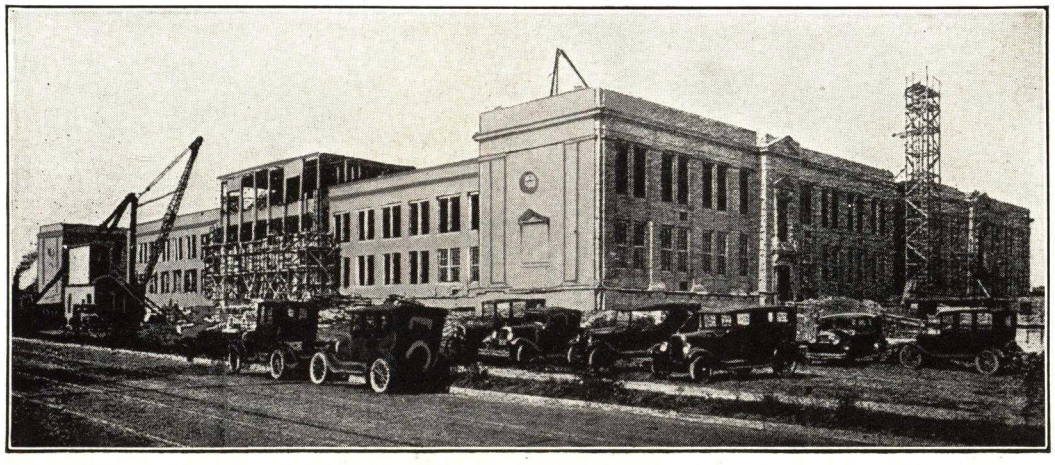
Building Blocks—Artificial limestone face building blocks are made in widths of 8 and 10 in., face 7¾ x 16 in. Between artificial stone facing and Naylegrip backing is an insulating filler. Coefficiency is approximately 92%.

Backup and Partition Blocks—For backing brickwork and for partitions, we make a wide range of sizes in building blocks. Made with either Naylegrip or Nailbond as a base.

Bondo Silica Colormix—For corridors, toilets, porch floors, stairs, basement floors, etc., we manufacture and install Bondo Silica Colormix. It has a cement base of hard durable finish of good appearance. Wears smooth and glossy.

At Your Service

More detailed description of any of our products and complete specifications are yours for the asking. Consult us on your particular problem.



Strong-Vincent High School

This fine building was erected in 1929.

45,000 sq. ft. of wood flooring secured to a Nailing Concrete sub-base furnished by NATIONAL NAYLEGRIP CO., INC.

It is as nailable today as it was 30 days after being installed—The nature of the composition insures nailability for centuries.

THE NAILCRETE CORPORATION

Manufacturer of the Original Nailing Concrete and Nailcrete Blocks

105 West 40th Street, NEW YORK, N. Y.

SELLING AGENTS IN ALL THE PRINCIPAL CITIES IN THE UNITED STATES

NAILCRETE (NAILING CONCRETE)

The Original Nailing Concrete

NAILCRETE
PATENTED - NAME REG.

Nailcrete is the original nailing concrete. It was developed after extended laboratory research and tests in connection with economic construction methods, and has been in successful commercial use for over 20 years.

Nailcrete is a cementitious, fibrous, all-mineral fire-proof compound, containing no animal or vegetable matter, no acids, alkalis or any substance injurious to metals, wood or other construction materials coming in contact with it.

Nailcrete is used extensively and successfully with many types of architectural construction ranging from large apartment buildings, hotels, schools, hospitals, public and industrial buildings to small residences.

Qualities and Physical Properties

Wherever a light, strong and easily applied fireproof, rotproof and verminproof nailing base for floors or roofing is desired, Nailcrete has proved its value. It holds nails firmly, and will not shrink or swell, as it is not affected by dampness. It is an effective sound-deadener and a poor conductor of heat. Nailcrete is mixed on the site and is poured like ordinary concrete.

The coefficient of expansion of Nailcrete and its setting and drying periods are substantially the same as those of cinder concrete. Nailcrete requires the same care in mixing and protection against freezing, quick drying, etc., as ordinary concrete.

Tests of Approval

Nailcrete has been approved as a structural fireproof material in several of our principal cities, and records of tests are available.

Characteristics of Nailcrete

Fireproof and Rotproof—Being an all-mineral compound, which is mixed with cement and sand in quantities that depend upon the purpose for which it is to be used, Nailcrete is absolutely fireproof, rotproof and verminproof.

Nailability—Nailcrete is permanently nailable. The nail-holding qualities, far beyond those required to meet service requirements, are clearly shown by tests conducted for us at Columbia University, New York City.

Light Weight—Nailcrete weighs about 96 lbs. per cubic foot, compared to 112 lbs. for cinder concrete, and 150 lbs. for stone concrete.

Compressive Strength—The compressive strength of Nailcrete depends upon the mixture used. Floor mixtures will average about 850 lbs. per square inch and those for structural slabs about 1,000 lbs.

Corrosion—As Nailcrete does not contain any saw dust, wood shavings or any combinations of injurious chemicals, it will not cause corrosion to materials with which it may come in contact.

Conductivity Tests—Conductivity tests indicate that a 4-in. slab of Nailcrete transmits approximately .8 B.t.u. per hour per square foot per degree Fahr., compared with a transmission of from 1.5 to 2.25 B.t.u.'s for concrete.

Uses of Nailcrete

Nailcrete is used as a nailing base for wood floors, eliminating sleepers, sleeper clips, underflooring or sheathing and is more durable than ordinary construction using wood sleepers and cinder or stone-concrete fill. It is delivered in burlap bags, each containing the correct quantity for the unit mix. It is mixed on the job with portland cement, screened sand and clean water, and screeded smooth and level. To insure the best results complete mixing and laying directions, covering the conditions of each application, are furnished when the material is ordered. Following are some of its uses:

For Subfloors—Nailcrete is laid not less than 2 in. thick as a subfloor on top of the structural slab or floor arch, to which is directly applied wood flooring, cork tile, etc., giving the floor greater resiliency and making it more impervious to sound. Sleepers, underfloor and cinder fill are eliminated. (See specifications.)

For Reinforced Floor Slabs—Nailcrete is used 2 or more inches thick on top of metal lath placed on metal lumber or bar joist floor beams. In this case the Nailcrete acts as a fireproof floor slab and as a nailing base for the finished wood floor. (See specifications and table of safe loads.)

For Roof Coating—A fireproof, rotproof nailing base 1½ to 2 in. thick on top of cinder or stone concrete or gypsum roof slabs to receive tile, slats, copper, etc. (See specifications.)

For Reinforced Roof Slab—A poured-in-place construction on rafters of steel, metal lumber or bar joists. (See specifications and table of safe loads.)

For Floor-Fill—Under cement finish, terrazzo, marble, tile, etc., as a non-corrosive fill in place of cinder concrete or other floor fills. (See specifications.)

For Plaster, Interior and Exterior—For *interior plastering*, especially for fireproofing, sound-insulating and as a nailing base for wood paneling; for *exterior plastering* of penthouse walls, skylight curbs, etc., to receive sheet metal or other covering.

For Carpet Nailing Strip — In connection with concrete floors, poured in place where required. (Consult The Nailcrete Corporation for specifications.)

For Pre-Cast Nailable Roof Slabs and Nailcrete Nailable Cinder Blocks—Can be supplied only in certain regions. (Consult The Nailcrete Corporation for data.)

NAILCRETE SLABS—SAFE LOADS IN POUNDS PER SQUARE FOOT

Gross sectional area of steel in sq. in. per ft. slab	Thickness of Nailcrete above steel	Span in feet									
		1½	2	2½	3	3½	4	4½	5	5½	6
⅜-in. Hy-Rib, Ribplex or equal, .061 sq. in.	2 in..	480	312	176	122	...	...	...	...	...	...
	2½ in..	...	...	232	161	118	91	...	...	...	...
	3 in..	...	...	...	...	144	110	87	...	...	...
¾-in. Hy-Rib, Ribplex or equal, .1407 sq. in.	2 in..	...	...	...	158	114	87	...	...	...	...
	2½ in..	...	...	...	230	171	130	102	...	...	...
	3 in..	...	...	...	...	144	110	87	...	...	...
	3½ in..	...	...	...	...	...	228	180	146	121	...
	4 in..	...	...	...	...	...	...	238	193	159	134

Nailcrete weighs about 96 lb. cu. ft. or 8 lb. per in., 1 ft. square.

Table based on WL/10. For WL/8 (or simple span), deduct 20% from above.

Brace self-centering lath to support wet Nailcrete.

Safe loads on spans above 6 ft. furnished on request.

Total live and dead load on tile roofs: 2-ft. slab, 66 lb.; 2½-ft., 70 lb.; 3-ft., 74 lb.; 3½-ft., 78 lb.; 4-ft., 82 lb. per sq. ft.

Nailcrete Mixtures and Cost of Materials

For Floors—1 bag Nailcrete, 2½ bags cement, 7 cu. ft. sand. Will cover about 60 sq. ft., 2 inches thick.

For Roofs — *Over Structural Slab*: 1 bag Nailcrete, 2 bags cement, 8 cu. ft. sand. Will cover about 60 sq. ft., 2 inches thick.

As a Structural Slab: 1 bag Nailcrete, 2 bags cement, 4 cu. ft. sand. Will cover about 42 sq. ft., 2 inches thick.

The cost of materials in the unit mix depends upon local conditions. In most places it should not exceed 8c per sq. ft.

2 in. thick for floors, or for roofs over a structural slab, and 11c as a structural slab on roofs, but each case should be figured separately on account of differences in freight rates, trucking and labor costs for handling. The mixing and laying costs will approximate those for concrete. On floors it averages from 2½c to 5c per sq. ft., depending upon wages, areas and conditions. On roofs the cost will be correspondingly more. The figures given do not include the contractor's overhead and profit.

Specifications for Nailcrete

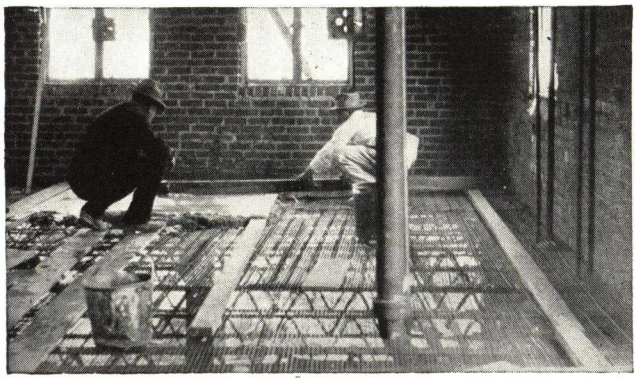
Note: Always specify Nailcrete by name.

Materials—Nailcrete shall be made with portland cement and sand strictly in accordance with the specifications of the manufacturer. All sand shall be sharp, clean, and screened through ¼-in. mesh.

Preparatory Work—Immediately before Nailcrete is laid, the surface to be covered shall be swept broom-clean, thoroughly wetted and grouted.

Setting—All Nailcrete shall be allowed to set properly before being walked on.

Note: Ordinarily 2 days in summer and 3 days in winter.



Method of Applying Nailcrete Over Steel Joist and Hy-Rib in a Residence

Nailcrete Subfloors—On structural floor construction Nailcrete shall be laid 2 or more inches thick and screeded, and, if necessary, troweled to a level.

When Nailcrete is dry, the surface shall be given a brush coat of asphaltic waterproofing before flooring is laid. Flooring to be nailed with 8d cut nails, driven at an angle of approximately 45°.

Note: For high class work specify (under the heading of Carpentry) 1 layer of tarred paper (not less than 2-ply) additional deadening felt, if desired, and the finish wood flooring to be used. Underflooring is never necessary with strip flooring but is recommended where parquet flooring is to be used.

On Metal Lumber Beams—Cover the floors of rooms, etc., (specify which ones are to be covered), with metal lath secured directly to the beams (not over 2 ft. apart) and on top of the metal lath put a bed of Nailcrete not less than 2 in. thick at the thinnest point, screeded level to receive the finish flooring specified under Carpentry.

Note: In high class work specify paper as above. Even in work of the highest class, underflooring is unnecessary as stated above.

Nailcrete Roof Coating—The structural roof construction shall be covered with 2 in. of Nailcrete.

Note: If slate is thicker than ¾ in. consult The Nailcrete Corporation as to the thickness of the Nailcrete.

Reinforced Sloping Roof Slab—Cover steel rafters with self-centering lath (as specified by manufacturers) or pour in place fabric-reinforced Nailcrete slab .... in. thick. (See table for areas of steel and safe loads.)

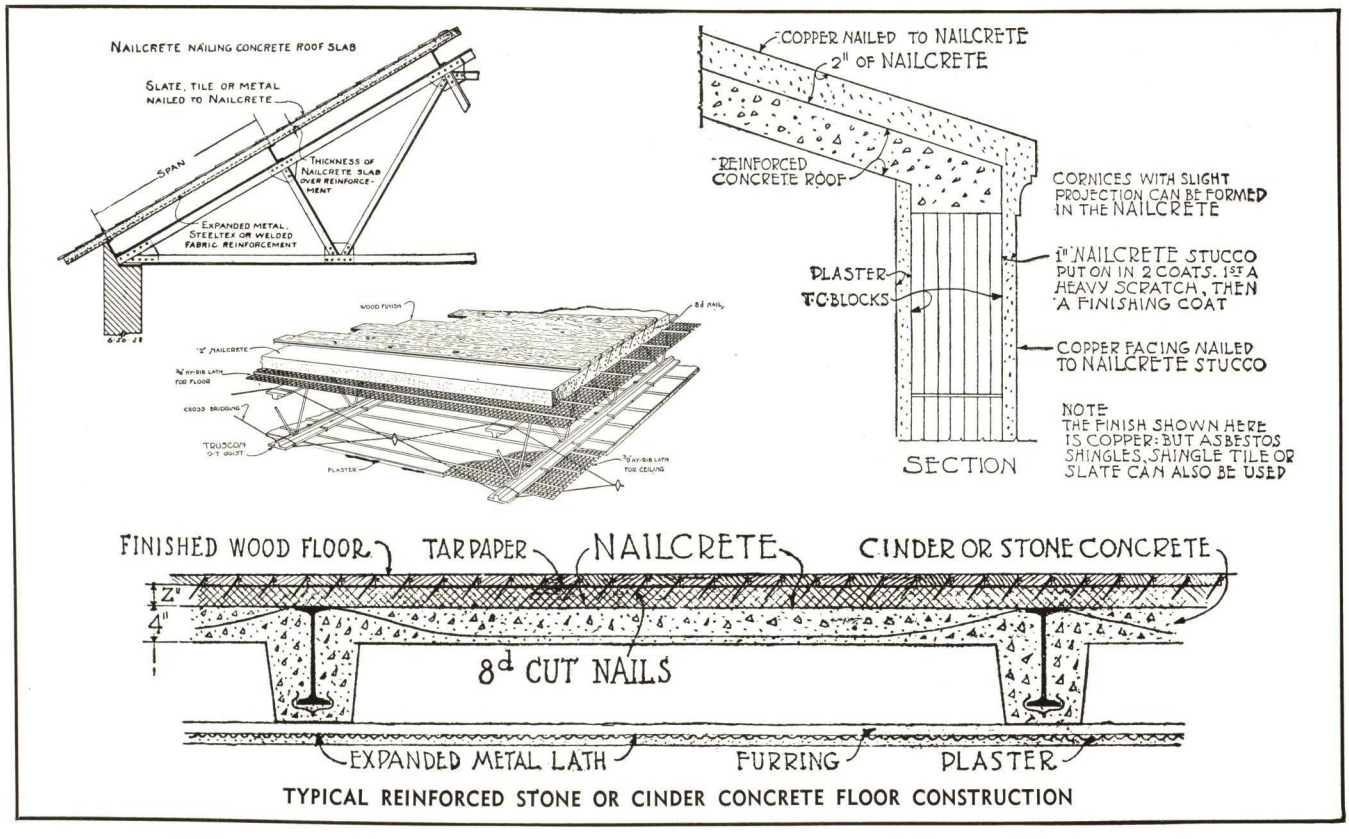
Plaster—*Interior*—Plaster interior walls to an approved finish, true and even as per instructions of The Nailcrete Corporation.

Exterior—Plaster the exterior of penthouse walls, skylight curbs, etc., with Nailcrete plaster 1 or more inches thick in 2 coats, scratch and finish, troweled (or floated) true and even.

Note: If the Nailcrete plaster is to be applied to gypsum blocks, the blocks should be covered first with proper bonding material, and the Nailcrete is then to be applied while the bonding material is still tacky.

Floor Fill—Over structural arch (specify rooms or areas) pour in place Nailcrete floor fill as indicated on drawings.

Carpet Nailing Strip—Pour in place, as indicated on drawings, Nailcrete Carpet Strip material as specified by The Nailcrete Corporation.



TYPICAL REINFORCED STONE OR CINDER CONCRETE FLOOR CONSTRUCTION

3
35

ESTABLISHED 1920

PORETE MFG. CO.

TELEPHONE
Kearny 2-4070

Manufacturers of Lightweight Concrete Products

Porete Avenue, NORTH ARLINGTON, N. J.

Products

PORETE LIGHTWEIGHT CONCRETE:
Precast for Floor and Roof Slabs.
Porete Fill (Poured in Place).
Porete Floor Systems.
PORETHERM—Insulation.
PORETE NAILFILL—A Lightweight Nailing Concrete.
POREX SLABS—For Roofs, Floors, Ceilings and Walls.
CONCRETE DECKS for Stadiums.
SLABS OF HEAVY CONCRETE—Cast Stone.

What Porete Is

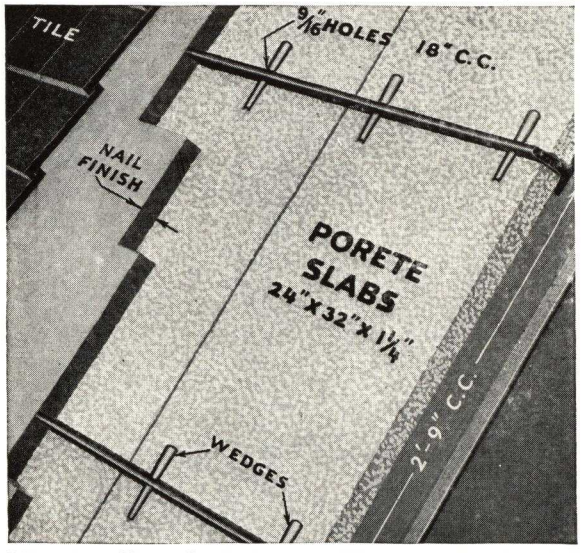
Porete is a lightweight cellular concrete made of Portland cement and sand. It is of uniformly honeycombed structure and combines the durability of concrete with the lightness of wood. Porete is made of a very rich cement mix and any reinforcing metal is thoroughly coated and protected against corrosion.

Porete can be cast in different weights from 19 lbs. per cu. ft. to 70 lbs. per cu. ft. and heavier. On account of the air cells which it contains, it is a good heat and sound insulator and a better fire resisting material than solid concrete. Its permanency is equivalent to that of concrete and its strength improves with age.

The PORETE MFG. CO., organized in 1920, is the pioneer in the development of lightweight cellular concrete and its adaptation to roofs and floors. The nailable Porete roof decks for steep roofs, as well as the various flat roof constructions, of which millions of square feet have been erected, are recognized as the best in the roofing field.

PRECAST FLOOR AND ROOF SLABS

Slabs Made of Lightweight Aerated Concrete

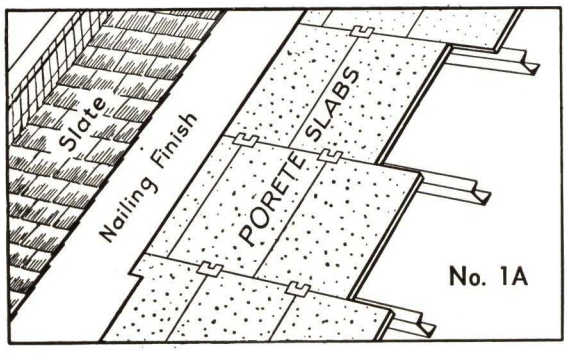


No. 1A—Short Span Porete Slabs with Field Finish

Purlin spacing 2 ft. 8 in., thickness 1¾ in., weight 10 lbs. per sq. ft.; nailable; good heat insulation.

These slabs are reinforced with welded galvanized wire fabric. 1¼-in. thick slabs are clipped to channels or laid on T-irons and covered with a ½-in. nailing finish. This is the best deck for roofs of complicated nature intersected by hips, valleys and dormers. On roofs above 45° pitch, we recommend the slabs to be laid on T-irons as shown.

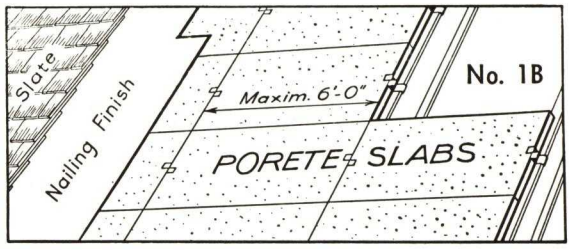
The short span precast slab construction with T-irons and wedge pins as shown in the cut on the right has become the standard for steep tower and mansard roofs. The exposure of such roofs to high winds at great heights demands a roof deck to which tile, slate, copper or lead roofing can be nailed with safety. Many of the most prominent skyscrapers with tower roofs in the east are covered with this construction.



No. 1B—Long Span Porete Slabs with Field Finish

Purlin spacing 3 to 6 ft., thickness 2 to 3½ in., weight 11 to 16 lbs. per sq. ft.; nailable; excellent heat insulation.

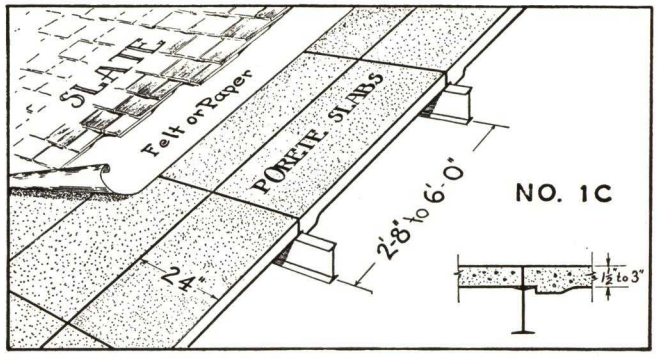
These slabs are reinforced with welded galvanized wire fabric. They are laid on channels or I-beams to which they are fastened with steel clips. They are covered with a ½-in. nailing finish. The steel purlins can be laid horizontally or in vertical planes. This is the best deck for sloped roofs with large unbroken areas as on school buildings, churches, etc. It is advisable to lay out the steel with a spacing as uniform as possible to avoid many different size slabs. This deck has very high heat insulating value. Due to the monolithic field finish it makes a first grade foundation for the roofing particularly where slate, tile or sheet metal roofing has to be nailed up.



No. 1C—Long Span Porete Slabs without Field Finish

Purlin spacing 3 to 6 ft., thickness 2 to 3½ in., weight 11 to 16 lbs. per sq. ft.; nailable; excellent heat insulation.

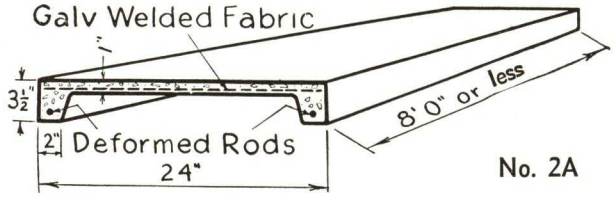
These slabs are reinforced with welded galvanized wire fabric. They are used on the same kind of roofs as the Long Porete Slabs with field finish under No. 1B. The main difference is that these slabs are cast to accurate thickness so that when they are laid tight together they form a smooth bed for the roofing which goes on top of it without the application of a field finish.



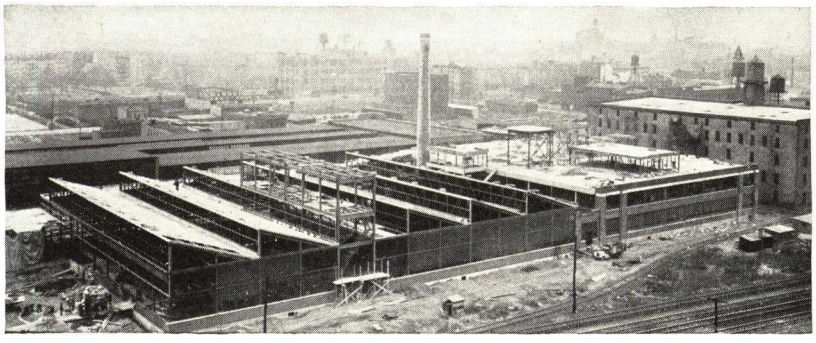
No. 2A—Channel Slabs

Made of dense vibrated concrete using lightweight aggregate. No field finish. Purlin spacing 5 to 8 ft., thickness 3½-in. leg, 1-in. web; weight, 12 to 14 lbs. per sq. ft. depending upon aggregate; not nailable; fair heat insulation.

These slabs are reinforced with a deformed steel bar in each leg and a welded wire fabric in the web. They are laid on channel or I-beam purlins, and the joints are pointed up with elastic cement. They make the most economical roof deck for large unbroken roof areas and are particularly well suited for warehouses, manufacturing plants, piers, etc.



No. 2A

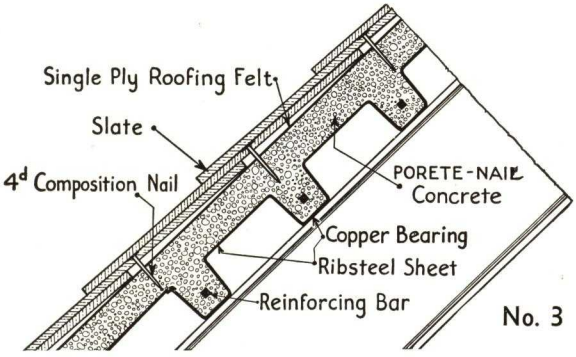


Channel Slab Roof, Publication Building, Hoboken, N. J.
THE BALLINGER CO., Philadelphia, Pa., Architects

No. 3—Rib Steel Roof Decks

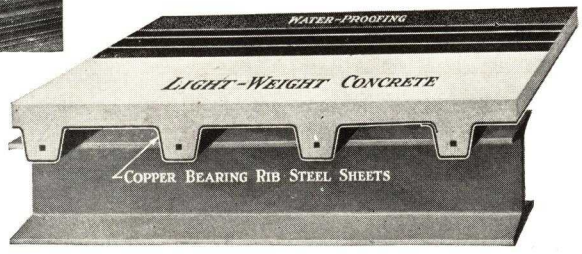
Made of copper bearing sheets of No. 20 to No. 24 gauge covered with a field concrete finish, purlin spacing 3 to 10 ft., thickness of slab 3 to 3½ in., weight 9 to 16 lbs. per sq. ft., can be made nailable; fair heat insulation.

These decks are recommended particularly on buildings for large unbroken roof areas with flat or sloped roofs where great rigidity of the roof deck is required. The ribs are 1½ in. deep on standard and 2 in. deep on supersheets, and are spaced 6 in. on centers. The sheets are laid on structural steel



No. 3

purlins and securely fastened to them with clips. After the sheets are laid, they are covered with concrete. On flat roofs, the usual application is 1 in. of cement grout, on sloped roof 1½ in. of nailing concrete suitable for the nailing of slate, tile or metal roofing. The ribs are reinforced with independent steel bars in each corrugation. The sheets are painted with a shop coat of either black asphaltum or aluminum paint on the bottom. This construction is suitable not only for medium spans but also purlin spacing up to 12 ft.



PORETE FILL (CAST IN SITU)

Porete is made by aerating a slurry of Portland cement and small aggregates. This aerated mixture is poured to the proper level where it sets; no expansion takes place afterwards. The weight per cubic foot of the final cellular concrete is predetermined. *An ordinary concrete mixer of the tilting type can easily be adapted to pour this cellular concrete, also most truck or transit mixers are practical to use.*

Porete Fill can be made in any weight from 19 to 90 lbs. per cu. ft. Fills which weigh 32 lbs. per cu. ft. and less are designated as PORETHERM on account of their high insulating qualities. The table below gives the insulating value for different weights compared with other materials.

Materials	Weight per cu. ft., lbs.	Coeff. Heat. Cond. B.T.U.'s	Wall thickness for same insulation, in.
Cork Boards	9	.30	1.
Poretherm 19	19	.37	1.3
Porex Board	24	.46	1.6
Poretherm 32	32	.63	2.1
Porete for Floor Fill	45	.80	2.7
Porete for Structural Slabs	65	1.1	3.7
Wood Dry	40	.9	3.0
Brick Wall	110	4.4	15.0
Concrete	140	8.0	27.0

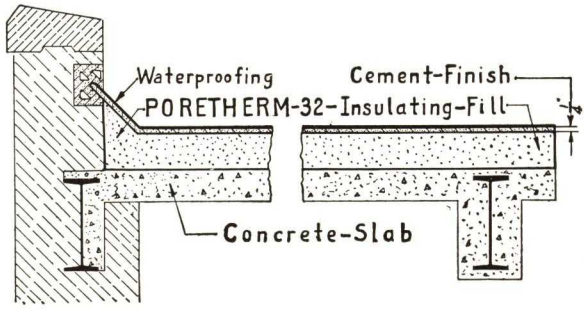
PORETHERM 19—Weighs 19 lbs. per cu. ft., is recommended for high and low temperature insulation, and is particularly economical on floors and roofs of refrigerating buildings.

Poretherm 32 As an Insulating Fill for Roofs and Floors

PORETHERM 32 is a low cost, high grade insulation material that can be poured on the job. It consists of almost nothing else but Portland cement. 2.1 in. in thickness have an insulation equivalent to 1 in. of cork. It is a heat and sound insulating material par excellence, because it is permanent and fireproof. Unlike materials of vegetable or wood fibre, it does not deteriorate when continuously exposed to moisture. It is odorless, permanent and fungi proof. PORETHERM is solid, uncompressible under ordinary loads and does not settle or sag like loose insulating materials. It is cast monolithically without joints, which are liable to decrease the insulation.

When used as an insulating fill on roofs, it is not necessary to grade the structural slab accurately, as PORETHERM being not much more expensive than concrete, when poured on the structural slab will fill up all the irrgularities. It can also be used for forming crickets for drainage. On account of all these features and the low cost of the raw materials, PORETHERM 32 is today one of the most economical insulating materials on the market. The Roof Fill is usually covered with a 1:3 cement finish ¼ in. thick before the roofing is applied.

PORETHERM 32 is also made in precast blocks for heat and sound proof partitions. Size 12 x 30 in. x 3 to 6 in. thick.



Porete Fill 50 Lbs. Cu. Ft. and Heavier

Lightweight Concrete Fills are used between sleepers, under wood floors, also under cement and terrazzo finish.

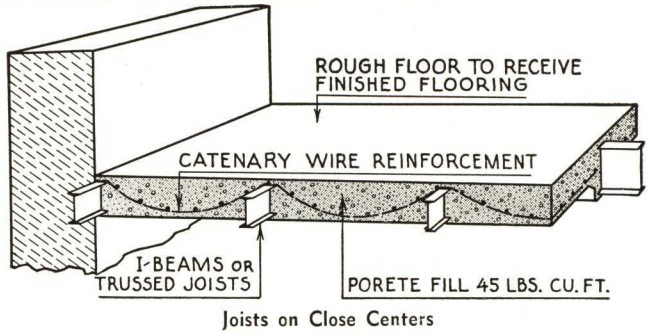
For these fills a heavier Porete is often preferred with a weight of 50 to 90 lbs. per cu. ft. These fills are made of Portland cement with an addition of sand or lightweight aggregates.

All these fills are mixed on the job and applied to the structural base to the final level at which the Porete sets. There is no expansion after pouring. As the Porete slurry when it comes from the mixer is a smooth emulsion of thick consistency, it will run around I-beam flanges and into corners very easily, and much better than ordinary concrete. The fill can be left rough on top for a cement or terrazzo finish, or it can be brought to a smooth level finish for a wood floor to be applied with mastic.

FLOOR SYSTEMS

Steel Beam and Lightweight Porete Fill Floor System

In this system the steel beams, which can be standard rolled sections, J & L Jr. Beams or Trussed Joists, are completely embedded in the lightweight concrete weighing 32 to 50 lbs. per cu. ft., the weight depending upon the loads and span. A catenary wire reinforcement over the beams is used.



Joists on Close Centers

This Floor System is exceedingly simple and flexible. The steel beams are designed to carry the necessary loads. A temporary centering is hung up from the steel beams, so that no expensive shoring is needed. Pipes and conduits can be directly embedded into the fill. Holes can easily be cut where required.

When the beams are on close centers (24 to 30 in.) the floor slab can be as thin as 6 in. When 4-in. beams are used this leaves 1 in. below and 1 in. above the beams.

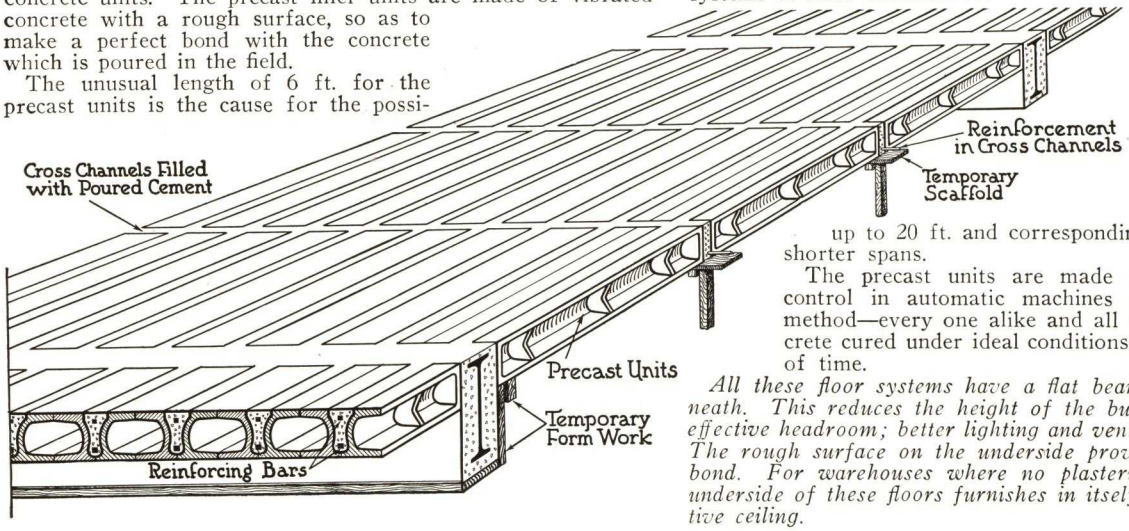
For close spacing of the beam centers, a fill weighing only 32 lbs. per cu. ft. will develop all the necessary strength to carry the usual live loads. This light fill is covered with ¼-in. thick 1:3 rough cement finish which serves as a construction floor until the finished floor is put on top. This makes an exceedingly light floor which weighs only about 20 lbs. per sq. ft. for a thickness of 6 in.

For wider spacing of the beams up to 8 ft. the thickness of the fill should not be less than 8 in. and the weight 45-55 lbs. per cu. ft., depending upon the load and spacing.

Long Span Precast Unit Floor System

This is a one-way reinforced concrete slab consisting of T-beams poured in place between 6-ft. long precast hollow concrete units. The precast filler units are made of vibrated concrete with a rough surface, so as to make a perfect bond with the concrete which is poured in the field.

The unusual length of 6 ft. for the precast units is the cause for the possibility of quicker erection with less labor and for a minimum of temporary framing and shoring not possible with other systems of floor construction.



The Porete Long Span System is based on standard reinforced concrete practice. This floor system, without a cement finish on top, is good for 75 lbs. per sq. ft. live load for spans up to 20 ft. and correspondingly higher loads on shorter spans.

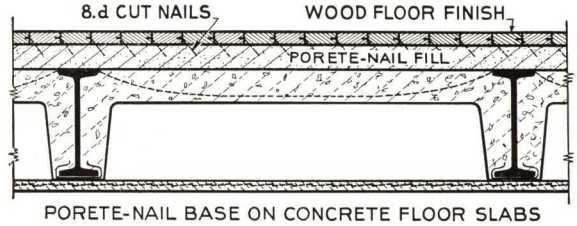
The precast units are made under rigid factory control in automatic machines using the vibrating method—every one alike and all of high quality concrete cured under ideal conditions for the right length of time.

All these floor systems have a flat beamless ceiling underneath. This reduces the height of the building for the same effective headroom; better lighting and ventilation is obtainable. The rough surface on the underside provides a good plaster bond. For warehouses where no plastering is required, the underside of these floors furnishes in itself a light and attractive ceiling.

PORETE NAILFILL

Porete Nailfill is an all-mineral compound principally composed of asbestos. When mixed with Portland cement, sand and water, it forms a plastic mortar that sets similar to concrete, and when matured it becomes an elastic, lightweight concrete, into which nails can be driven as readily as into wood, and in which the nails will hold. As it consists entirely of minerals, it is fireproof and verminproof. Like concrete its strength improves with age; it will not disintegrate and will always retain its nailing qualities.

Porete Nailfill concrete forms a permanent, resilient, lightweight nailing base. A 2-in. layer is placed on top of the concrete slab with which it forms an excellent bond. The wood flooring can be nailed directly to this base, as soon as it is set and dry. The weight of Porete Nailfill concrete is 96 lbs. per cu. ft.



PORETE-NAIL BASE ON CONCRETE FLOOR SLABS

The Porete Mfg. Co. *will furnish and erect all these products and systems and guarantee satisfactory results or it can furnish the necessary supervision for the erection.*

The Engineering Dept. of the Porete Mfg. Co. *is ready to make suggestions regarding the steel layout so as to attain the best co-operation for a most economical design.*

POREX SLABS

Made of Portland Cement and Mineralized Wood Fibre

Porex Slabs are made of high grade mineralized wood fibre bound under high pressure with Portland cement. Being bound with Portland cement, which is insoluble in water, the Porex Slabs will stand up under continuous exposure to water. For this reason they can be stored out of doors in the rain and frost without being damaged. The materials of which they are made are straight Portland cement with a tough mineralized wood fibre as an aggregate.

Porex Slabs are odorless, vermin and fungi proof; they are highly fire-resisting. Covered with ½-in. cement plaster on the fire side, they will resist a fire of 1700° Fahr. for over an hour.

Due to their light weight Porex Slabs are excellent for heat and sound insulation. They can be sawed like ordinary lumber. On account of the large size slabs, covering 11 sq. ft., the labor cost for erecting them is low.

Because of its porous texture, Porex has a high sound absorption. When used on ceilings or walls it will provide great acoustical qualities combined with an attractive surface finish of natural gray color. The exposed surface can be painted any suitable color, and it can be cleaned easily with a brush.

Porex Slabs are 20 in. wide x 80 in. long, 1 in. and 1¾ in. thick, covering an area of 11.1 sq. ft. Nine slabs have an area of 100 sq. ft. The 1-in. slabs weigh 2 lbs. per sq. ft. and the 1¾-in. slabs 4 lbs. per sq. ft.

Porex Roofs and Floors

1¾-in. Thick Porex

The 1¾-in. slabs are recommended as floor and roof slabs on wooden or steel joists up to 24-in. centers. When used in this way they are usually covered with a thin cement grout ¼ in. thick. On floors this makes a good construction floor until the finished floor is ready to be set up. This construction is light in weight, gives excellent resiliency and elasticity which is usually lacking in a concrete floor. This floor system is low in price.

On roofs when slate or tile has to be nailed up, a ½ in. thick Porete Nail Finish should be applied instead of the cement finish.

STRENGTH OF POREX FLOOR SLABS 1¾-IN. THICK

Cement Finish Thickness, in.	Total Thickness of Slab, in.	Spacing of Joists, in.	Breaking Load, lbs. per sq. ft., uniform
None	1¾	24	210
¼	2	24	240
¼	2	16	800

Porex Slabs for Stucco Walls

1-in. Thick Porex

Porex Slabs are nailed to the upright studs on 16-in. centers over a waterproofing paper, or they are fastened to steel framing with special clips. After they are erected they are covered with two coats of cement stucco. Their rough surface makes an excellent bond with stucco, and the stucco is not affected by the materials of which the Porex Slabs are made.

The 1-in. thick Porex Slabs are also economical for fireproof ceilings under wooden or steel joists in basements and attics; for forms or centering of concrete slabs; and for furring of brick and stone walls. Porex Slabs covered with cement stucco makes a low cost indestructible permanent wall with good heat insulating value. This construction is not only recommended for dwelling houses, but is particularly valuable for farm buildings where the fireproofness is an important factor.

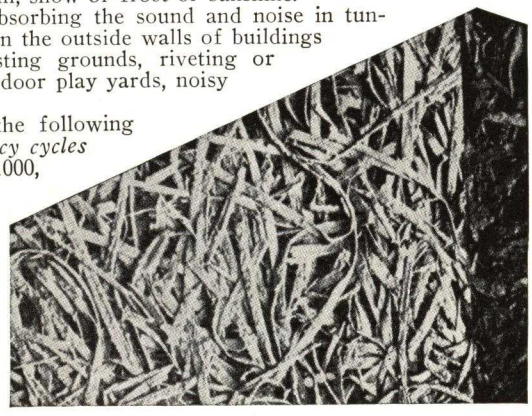
Silent-Porex

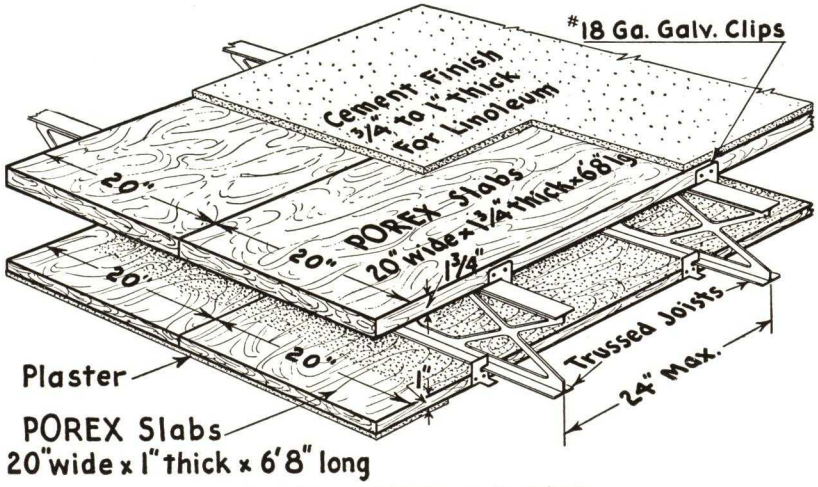
Acoustical for Outdoor Use

Silent-Porex Slabs, 1¾ - in. thick, 20 x 80 in., are fastened against the outside walls of buildings where noise has to be reduced. Silent-Porex is the only material made in large sheets, which can be set up outdoors and which is not affected by rain, snow or frost or sunshine.

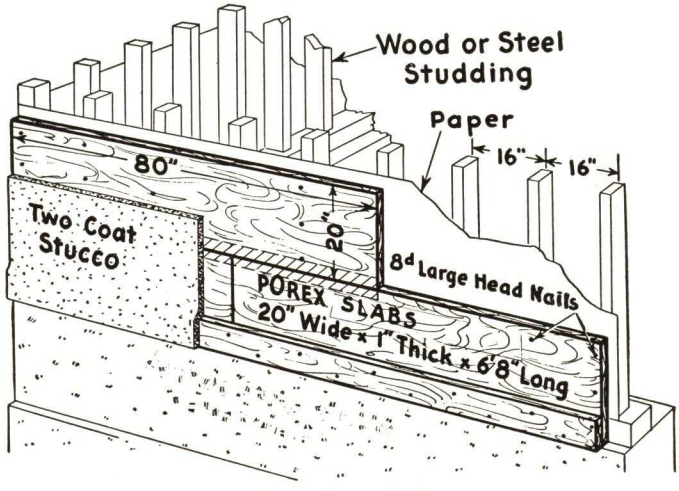
We recommend it for absorbing the sound and noise in tunnel ventilating shafts and on the outside walls of buildings near aeroplane engine testing grounds, riveting or air hammer operations, outdoor play yards, noisy radio sets, etc.

Laboratory tests show the following sound absorption: *Frequency cycles per second:* 120, 250, 500, 1000, 4000; *percentage absorption:* .23, .43, .90, .74, .65.





Porex Floor and Ceiling on Steel Joists



Porex Stucco Wall

ALPHA STEEL CONCRETE CONSTRUCTION

A New System for Buildings and Bridges

The Alpha System of steel concrete construction consists of a structural steel beam, a reinforced concrete slab, and a spiral electrically welded to the beam and solidly embedded into the concrete slab, thereby combining these three elements into one structural unit. Numerous tests have shown that the spiral is an ideal and reliable means for transmitting all the horizontal shear from concrete slab to steel beam.

In the commonly used floor systems supported by steel framing, the steel beams carry the total load, and they are stressed for both tension and compression, while in the Alpha System the steel section, bonded solidly by the spiral to the concrete slab, takes only the tensile stresses and the concrete slab all the compressive stresses. The system therefore combines the advantages of standard steel construction with those of reinforced concrete. It is obvious that for equal strength the Alpha System can thus make use of considerably lighter steel sections, while the combined unit has nevertheless greater stiffness.

For example: If we compare a typical bay, 18 to 24-ft. span, of an office or apartment building, using short span concrete slabs supported on fireproofed steel beams, we find a saving in weight of steel for the same floor depth of 35% to 55% which results in a saving of 9¢ to 13¢ per sq. ft. of floor area in favor of the Alpha System. In this analysis the cost of the slabs between the supporting beams, is practically the same for both systems. In addition to the above, there is a saving in concrete for the Alpha System since the haunches of the steel section of this system will be smaller due to the lighter steel section used.

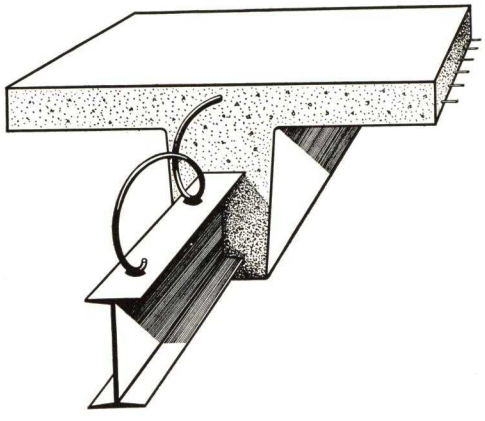
In heavier construction, such as warehouses and industrial buildings, the saving is even more pronounced and varies according to conditions from 17¢ to 30¢ per sq. ft. of floor area. In most cases the Alpha System effects a saving also in comparison to reinforced concrete structures.

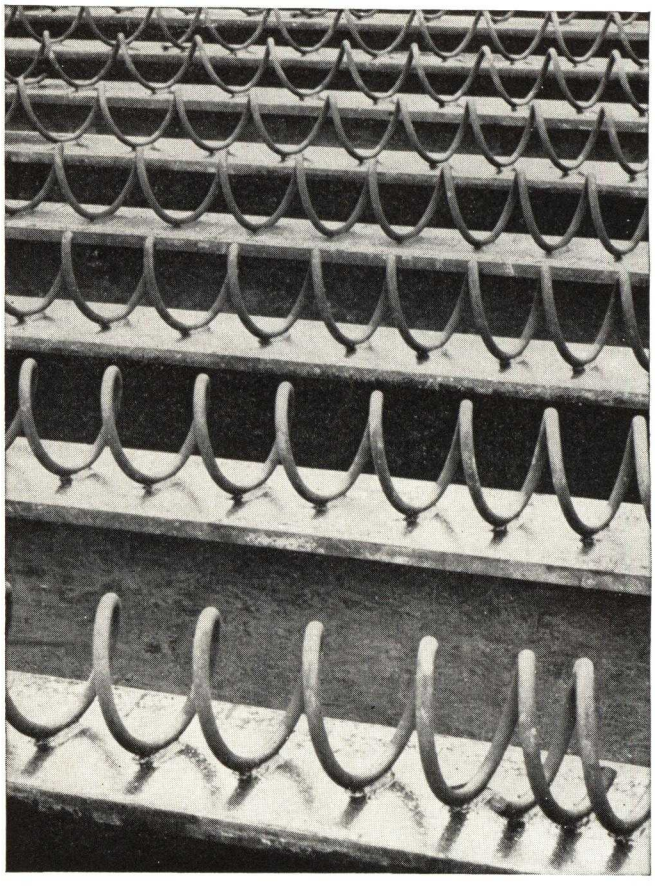
Standard structural shapes are used by the Alpha System. The erection of steel and concrete is done in the usual way and by the same trades, so that no established customs need be changed. Cover plates welded to the bottom flange of standard sections, special shapes, or riveted, or welded built-up sections with heavier bottom flanges make possible additional savings.

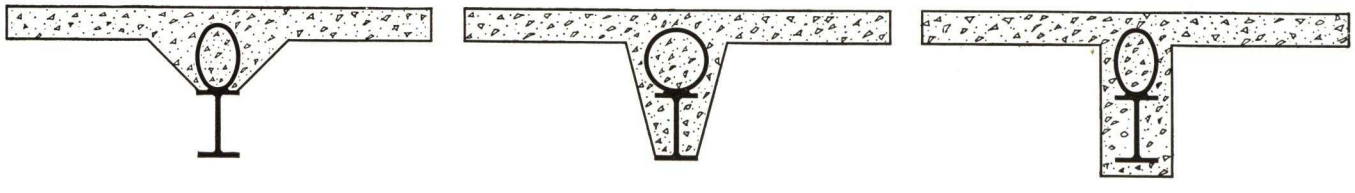
The Alpha System is suitable for any type of floor construction and no increase in floor depth is required. In fact, decreased depths are often obtainable. For instance, in bridges, whenever the girders can be adapted to the Alpha System, a reduced depth may be effected at the abutments, an important point with respect to the shortening of the approaches. In strengthening old bridges, the carrying capacity may be materially increased by the welding of a spiral to the existing beams and pouring a new concrete slab.

The designs and calculations for the Alpha System follow the standard formulas for reinforced concrete. We shall be glad to furnish comparative estimates and typical panel designs for building projects at no cost or obligation.

Numerous references.







Typical Alpha Beam Sections Showing Various Forms of Spirals and Beam Coverings

Porete Mfg. Co. is the Licensee of the Alpha System for Eastern United States. For other territories write Alpha Steel Concrete Construction, 55 West 42nd Street, New York, N. Y.

SECTION 3

CONTINUED ⟶

ESTABLISHED 1870

THE GEO. RACKLE & SONS CO.

Newburg Station P. O.

CLEVELAND, OHIO

RACKLE ROOFS FOR MODERN CONSTRUCTION

Pre-cast concrete slabs as a base for membrane waterproofing have furnished desirable and trustworthy roofs for over a third of a century. First used by railroads for simple structures such as freight houses and storage sheds, they have been adapted successively to factories, theatres, schools and all buildings with structural steel roof support. THE GEO. RACKLE & SONS Co., pioneers in developing this useful new building material, have achieved many improvements in the quality, lightness and economy of this low-cost, permanent material.

Architects and Builders will find here a concise discussion of general characteristics, design and construction details for floor or roof decks made with Rackle Concrete or Haydite Slabs. The material is simple as its specifications, wide in adaptability.

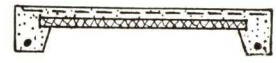
1. Permanency—and No Maintenance Cost!

First cost is last cost. Slabs are not affected by water, heat, condensation, steam, gases or rust. They never need to be painted, though can be if desired. They furnish a dry and even surface for the application of membrane covering. Rackle Slabs are fire resistant. Their merits in underwriter's tests have not been exceeded by that of any other building material used in masonry. There are cheaper roof decks, but none whose final economy and permanence compares with a Rackle Slab roof.

2. Speed of Erection

On buildings where time is important, the speed with which Rackle Slabs can be laid is an important factor in construction schedules. Large, easily handled units come to the job prefabricated, ready to be placed. Numerous high-speed building concerns rely completely on the Rackle organization to handle jobs of major importance.

RACKLE ACOUSTICAL ROOF SLABS

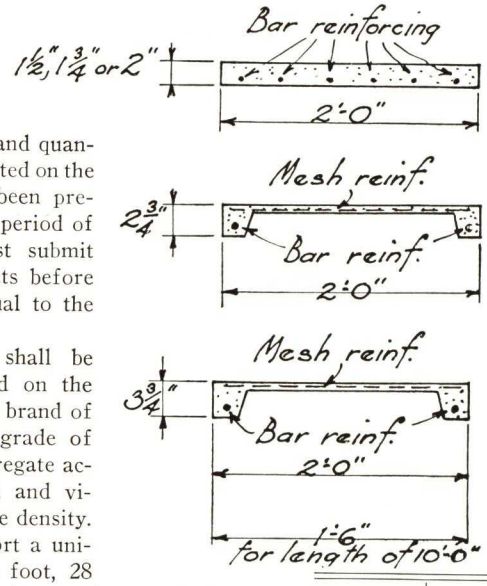


These slabs, when used for roof decks for schools, churches, auditoriums, gymnasiums, factories, etc., accomplish three important objectives, namely, fireproofing, adequate insulation, and sound absorption, which is now recognized as being so important to meet modern ideas of efficiency and general welfare. This modern type of construction accomplishes in one unit what required three individual operations by former methods. Where economy is paramount no further decoration is necessary.

If further information on any phase of Rackle products or their application is needed, it will be gladly furnished on request.

Specifications for Rackle Floor and Roof Slabs

(1) Kind—All material furnished under this specification shall be the product of THE GEO. RACKLE & SONS CO., or a manufacturer whose capacity and facilities for furnishing the quality, size and quantities of precast concrete slabs indicated on the drawings and whose product has been previously used on similar work for a period of at least five years and who must submit tests, list of buildings and architects before being accepted by architects as equal to the material specified.



(2) Strength—The roof slabs shall be precast concrete slabs, as indicated on the drawings, composed of an approved brand of portland cement and the highest grade of (Haydite) (Nailing) (Gravel) aggregate accurately graded, thoroughly mixed and vibrated to obtain the greatest possible density. All slabs shall be designed to support a uniform load of 250 lbs. per square foot, 28 days after manufacture, when tested with the maximum span used on the roof.

(3) Dimensions—Outside dimensions shall correspond accurately to sizes shown on the plans. All slabs shall have straight, perpendicular edges and true, unwarped surfaces. All cracked and broken slabs shall be rejected.

(4) Details—This contractor shall design and submit details to the architect for approval. These details are to be based upon the architect's drawings and steel fabricator's details. Manufacture of special size or shaped slabs shall not be started until details have been approved.

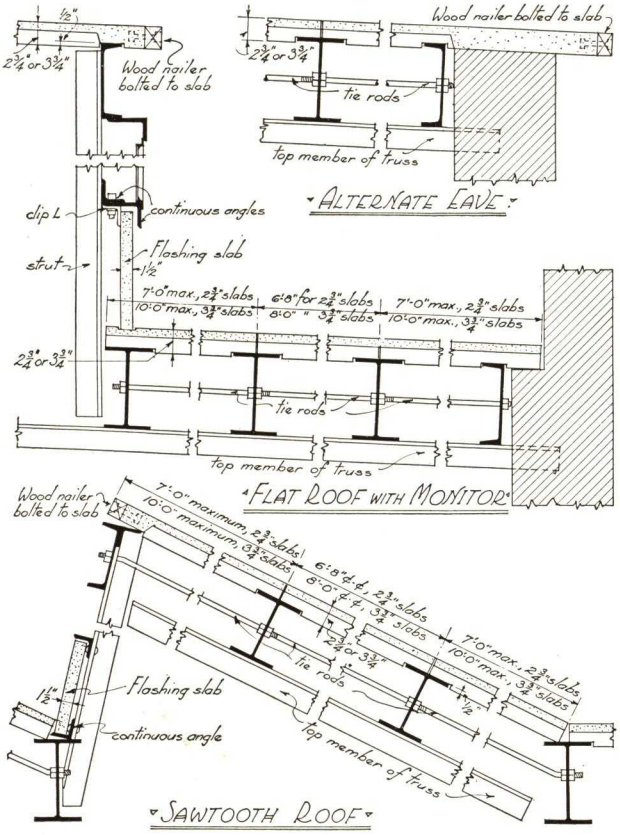
(5) Notification—The general contractor shall notify this contractor one week in advance when the roof will be ready for the application of slabs.

(6) Erection—All slabs are to be erected by this contractor in a thoroughly workmanlike manner. Joints are to be pointed on upper side with mastic cement and protected with 2½ in. strip of asphalt saturated duck over all joints. (Floor and nailing slabs do not require duck strip.) The completed work must present a smooth surface ready for the application of the composition or ornamental covering.

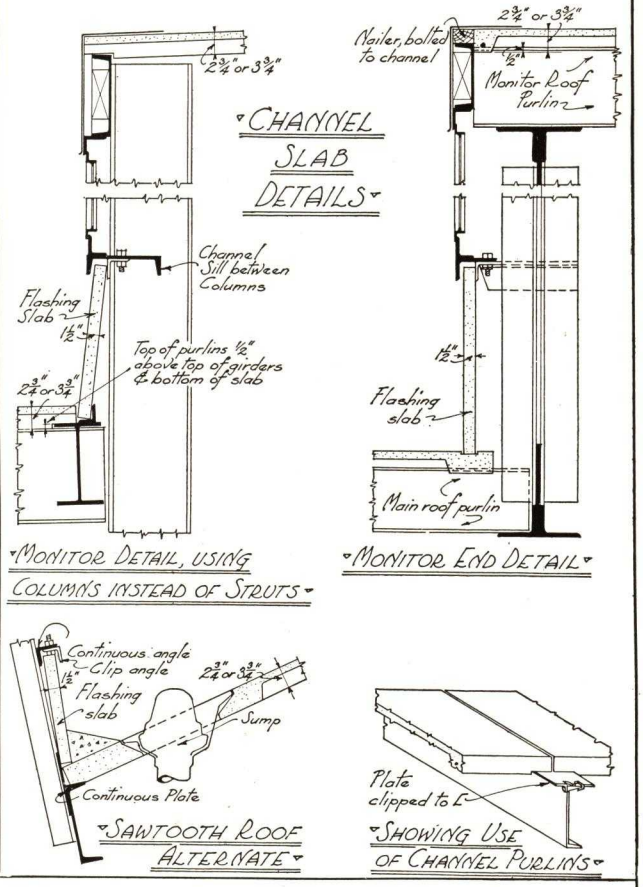
Type of slab	Standard length	Absolute max. length	Thickness	Width	Weight, sq. ft.	
					Gravel	Haydite
Flat	5'-0"	5'-6"	1½"	2'-0"	17 lbs.	12 lbs.
Flat	5'-6"	6'-0"	1¾"	2'-0"	19 lbs.	14 lbs.
Flat	5'-6"	6'-6"	2"	2'-0"	21 lbs.	16 lbs.
Channel	6'-0"	6'-8"	2¾"	2'-0"	15 lbs.	11 lbs.
Channel	6'-8"	9'-0"	3¾"	2'-0"	18 lbs.	14 lbs.
Channel	8'-0"	10'-0"	3¾"	1'-6"	20 lbs.	16 lbs.
Nailing Flat	5'-0"	6'-0"	2½"	2'-0"	22 lbs.	18 lbs.

Note: Add 7 lbs. per sq. ft. and 1¼" to thickness for nailing concrete on channel slabs.

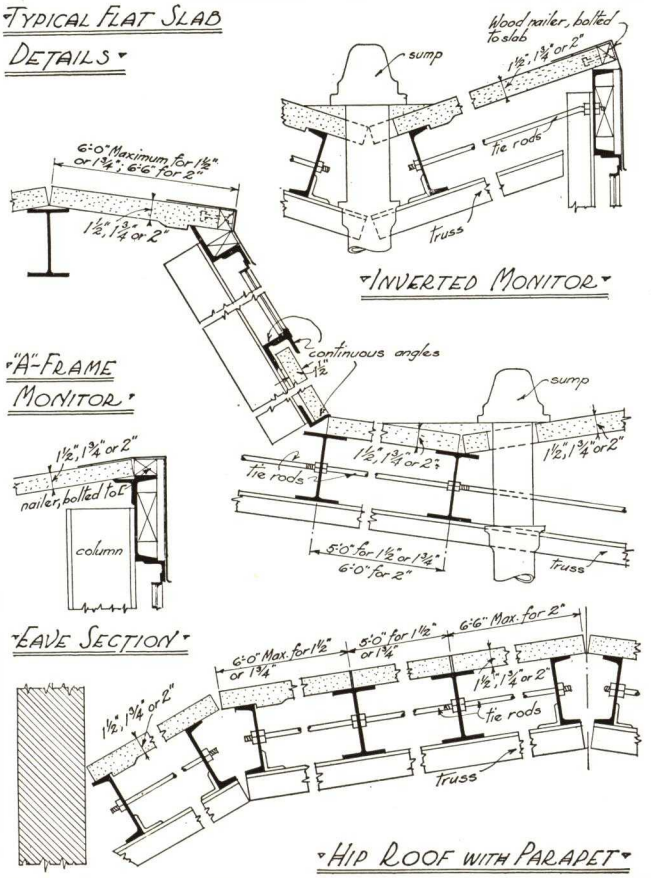
RACKLE CHANNEL ROOF SLABS



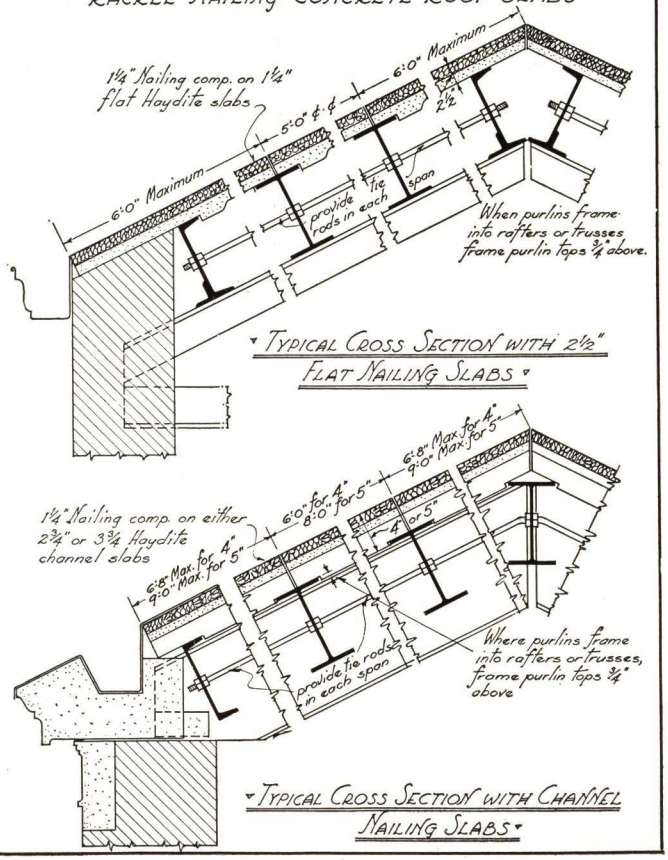
TYPICAL LONGITUDINAL SECTION



TYPICAL FLAT SLAB DETAILS



RACKLE NAILING CONCRETE ROOF SLABS



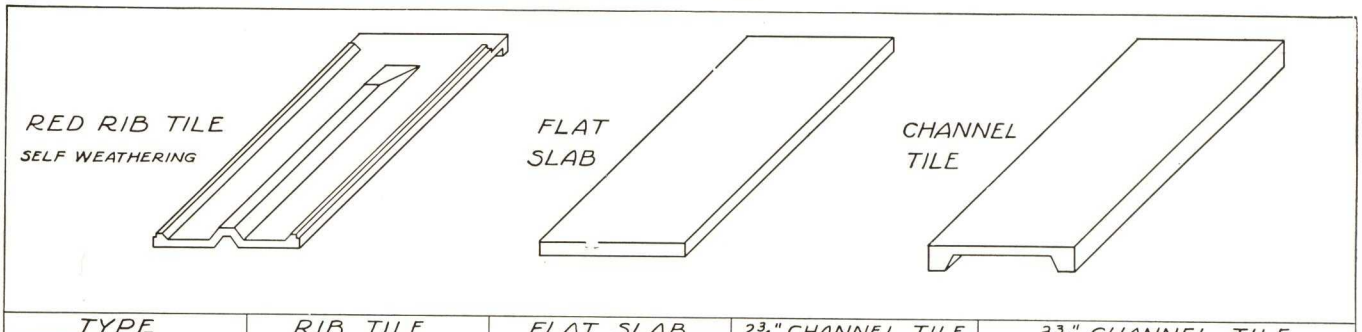
THE TRUSCON LABORATORIES

Cement Tile Division

WORKS AND GENERAL OFFICES

Caniff Avenue and Grand Trunk R. R., DETROIT, MICH.

OFFICES IN PRINCIPAL CITIES



TYPE	RIB TILE	FLAT SLAB	2¾" CHANNEL TILE	3¾" CHANNEL TILE
WIDTH	24" } STOCK SIZE	24" } STOCK SIZE	24"	24" | 18"
LENGTH	4'-4" } STOCK SIZE	5'-0" } STOCK SIZE	6'-8" MAX.	8'-0" MAX. | 9'-0" MAX.
THICKNESS	WEB - 1⅛"	1⅝"	LEG - 2¾" - WEB-1"	LEG-3¾" - WEB-1"
WEIGHT PER SQ. FT. HAYDITE	16 LBS.	13.5 LBS.	10.5 LBS.	12 LBS. | 13.5 LBS.
WEIGHT PER SQ. FT. SAND	17 LBS.	19 LBS.	16 LBS.	17.5 LBS. | 19 LBS.
REINFORCEMENT	WELDED GALV. MESH	WELDED GALV. MESH	MESH ¢ 2 DEF. BARS	MESH ¢ 2 DEF. BARS
ROOF PITCH	⅕ PITCH OR GREATER	FLAT OR PITCHED	FLAT OR PITCHED	FLAT OR PITCHED
ROOFING	SELF WEATHERING	COMP. ROOFING REQ'D	COMP. ROOFING REQ'D	COMP. ROOFING REQ'D
PURLIN SPACING	4'-0½" MAX. - 3'-9" MIN.	5'-0" MAX.	6'-8" MAX.	8'-0" MAX. | 9'-0" MAX.

Truscon Rib Tile

This reinforced cement roofing tile is self-weathering and is laid directly on the roof purlins. It is fireproof, watertight, of light weight, economical, not only in first cost, but in its permanence without upkeep expense. These tile, together with the necessary trim, are furnished in red color and add materially to the architectural beauty of any building.

Truscon Glass Insert Tile

These reinforced tile are exactly the same dimensions as the standard rib tile and are interchangeable with them. The glass is inserted after the tile is laid and glazed from the outside. Provides increased light over entire roof area or over certain operations as required. Should a glass become broken it can readily be replaced without disturbing the tile.

Truscon Haydite Flat Slabs

These precast reinforced factory-made flat slabs are laid directly on the supporting structural steel. Joints are cemented ready for application of composition roofing. The erection labor is speedily performed without interference with the work of any other trade. No centering or costly form work is required. Light weight—made from Haydite aggregate—fireproof, economical first cost, with no maintenance. Vibrated to give extreme density and solidity. Adaptable for both flat and pitched roofs.

Truscon Haydite Channel Slabs

The channel section design of these slabs permit light weight construction, where longer spans than practical for flat tile are required.

This type of slab is used under the same conditions and present the same advantages as the flat slabs.

Truscon Nailing Concrete Slabs

Where it is desirable to nail an ornamental roof covering and at the same time retain fireproofness, Truscon Nailing Slabs have been developed. The lower portion is of structural concrete and the upper 1¼ ins. of nailing concrete. The base portion may be either the flat type or the channel type, with a maximum span of 5 ft. 4 ins. and 6 ft. 8 ins. respectively.

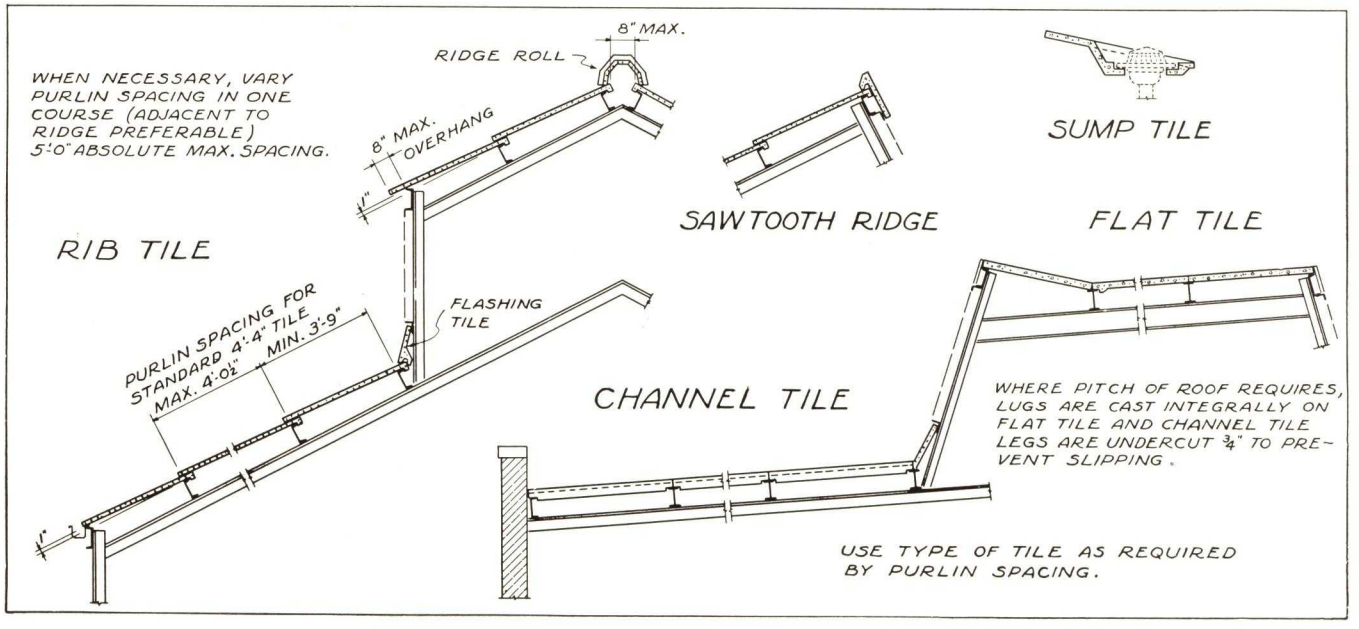
All of the foregoing types are properly reinforced and only the best materials are used.

Concrete mixes are all scientifically controlled by weight and all slabs are cured under constant temperature.

Being factory made, rigid inspection is enforced, which insures uniform excellence in composition, workmanship and results—a standardized product of extreme accuracy.

Installation made as easily in winter as in summer.

List of important installations, such as General Motors, Ford and others gladly sent on request.



DOUGLAS FIR PLYWOOD ASSOCIATION

Tacoma Building, TACOMA, WASHINGTON

The Association

A non-profit organization of United States manufacturers of Douglas fir plywood, founded to sponsor a continuing program of technical research, to promote the use of this material in construction and industry, and to help users employ it to the best advantage.

Inquiries as to the characteristics or uses of Douglas fir plywood will receive prompt attention. Address DOUGLAS FIR PLYWOOD ASSOCIATION, Tacoma, Washington, or any of the following industry mills:

ABERDEEN PLYWOOD COMPANY
Aberdeen, Washington

BUFFELEN LUMBER & MFG. CO.
Tacoma, Washington

CAPITOL PLYWOOD COMPANY
Olympia, Washington

ELLIOTT BAY MILL COMPANY
Seattle, Washington

HARBOR PLYWOOD CORPORATION
Hoquiam, Washington

M & M PLYWOOD CORPORATION
Portland, Oregon

NORTHWEST DOOR COMPANY
Tacoma, Washington

OLYMPIA VENEER COMPANY, INC.
Olympia, Washington

OREGON-WASHINGTON PLYWOOD CO.
Tacoma, Washington

THE PLYLOCK CORPORATION
Portland, Oregon

ROBINSON MANUFACTURING CO.
Everett, Washington

SMITH WOOD PRODUCTS, INC.
Portland, Oregon

UNITED STATES PLYWOOD CORPORATION
Seattle, Washington

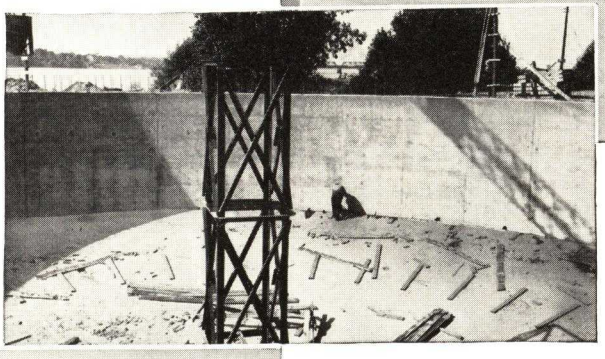
VANCOUVER PLYWOOD & VENEER CO.
Vancouver, Washington

WASHINGTON VENEER COMPANY
Olympia, Washington

WEST COAST PLYWOOD COMPANY
Aberdeen, Washington

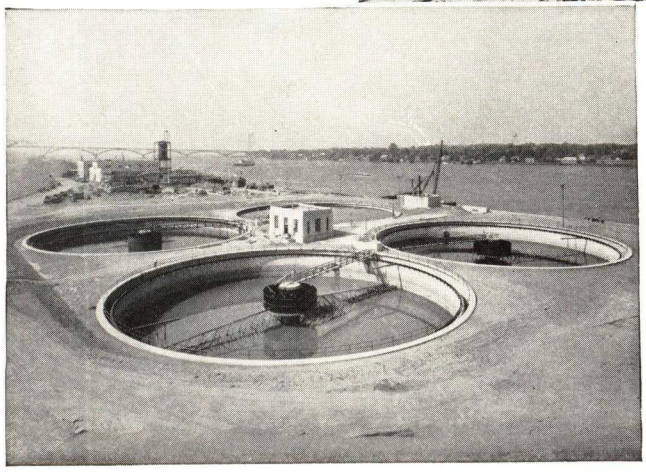
WHEELER OSGOOD SALES CORPORATION
Tacoma, Washington

Above: Columbia Broadcasting Company's KNX Studios, designed by William Lescaze, Architect and Earl Heitschmidt, Associate. Douglas Fir Plywood Concrete Form Panels ¾ in. thick were used for all exposed concrete except the round exterior columns where a single ply was used as the contact surface.



Right: Close-up detail of one of the four sludge digestion tanks of the $15,000,000 Buffalo Sewer Authority project. The Douglas Fir Plywood Concrete Form panels have just been stripped from the concrete.

Below: The four digestion tanks and the control building of the Buffalo Sewer project. The walls were formed with ⅝-in. Douglas Fir Plywood Concrete Form Panels. On this job 67,000 sq. ft. of concrete form panels were used for the contact surface of approximately 350,000 sq. ft. of the structure. Concrete form panels were also used for the conduits, the administration building, the service tunnels and other concrete structures.



SPECIFY PLYFORM FOR SMOOTH FINLESS CONCRETE

The specially-fabricated Concrete Form Panels of Douglas Fir Plywood should be specified when the economies of this type of construction with its repeated re-uses are desired. Where an indefinite number of re-uses is needed, the Exterior grade of plywood should be specified. For general information about Douglas fir plywood, see the Index of this edition of Sweet's Catalog File (Architectural). For complete information write for a copy of CONCRETE FORMS OF DOUGLAS FIR PLYWOOD.

THE HAUSMAN STEEL CO.

Steel Forms for Concrete Construction

P.O. Box 416, TOLEDO, OHIO

Products

REMOVABLE STEEL FORMS for concrete joists and adjustable round column forms.

REMOVABLE STEEL FORMS for any type of construction wherever there is sufficient duplication to make steel forms economical.

Experience

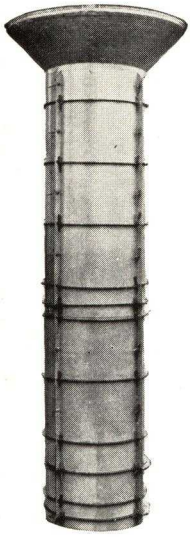
We have had twenty-four years' experience in design and construction of all types of wood and steel forms. Our forms have been used on hundreds of buildings throughout the country.

Service

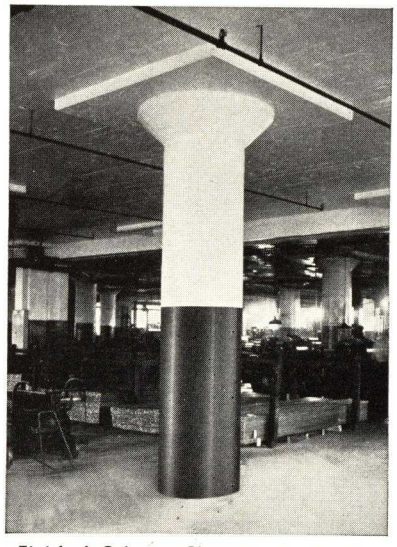
Forms are either leased outright or erected complete, including all centering underneath same. Our Engineering Department will prepare preliminary estimates and comparative cost data.

Cost

Estimates furnished promptly and costs vary with spans, loads, location and speed. Repeat orders confirm our claims for economy.



Hausman Adjustable Column Form Assembled



Finished Column, Champion Spark Plug Co., Toledo, Ohio
MILLS, RHINES, BELLMAN & NORDHOFF, Architects
THE HENRY J. SPIEKER CO., Contractors

ADJUSTABLE ROUND COLUMN FORMS

The Hausman Column Mold Form is an ingenious, adjustable device for forming perfect concrete columns of varying diameters and heights with speed and efficiency.

Built up out of panels of 20-gauge steel, the forms are easy to handle, though strong enough to carry the loads to which they are subjected. Construction is simple throughout. The panels are firmly held together to form a true circle by circular steel bands and steel wedges. By assembling the form with different sized panels, the diameter is changed. The diameter of the shaft must be in multiples of 2 in., the capitals in multiples of 6 in.

Capitals are adjustable to any column diameters specified. Forms may either be leased or erected complete. Consult us on your special problem.

Typical Installations of Column Forms

NAME	LOCATION	CONTRACTOR	ARCHITECT
Chevrolet Fisher Plant	Flint, Mich.	J. A. Utley	Albert Kahn
Eastman Kodak Co.	Rochester, N. Y.	Ridge Construction Co.	Owner
Educational Press	Columbus, Ohio	E. Elford & Son	Richards, McCarty & Bulford
Brown-Forman Distilling Co.	Louisville, Ky.	Geo. H. Rommel Co.	Joseph & Joseph
Shillito Department Store	Cincinnati, Ohio	Frank Messer & Sons, Inc.	Potter, Tyler & Martin
Federal Warehouse	Washington, D. C.	B-W Construction Co.	Lockwood, Greene, Inc.
J. L. Hudson Co. Delivery Bldg.	Detroit, Mich.	Bryant & Detwiler	Smith, Hinchman & Grylls
Marshall Field & Co., Warehouse	Spray, N. C.	Southeastern Construction Co.	N. C. Robert & Co.
Kimberley-Clark Corp. Whse.	Neenah, Wis.	Koepke Construction Co.	Owner

Typical Installations of Ribbed Slabs

State Hospital	Willard, N. Y.	A. E. Stephens Co.	W. E. Haugaard
U. S. Veterans Hospital	Bedford, Mass.	Thos. O'Connor & Co.	Veterans Bureau
Ohio State Office Building	Columbus, Ohio	Struck Construction Co.	Harry Hake
U. S. Veterans Hospital	Canandaigua, N. Y.	Irwin & Leighton	Veterans Bureau
U. S. Veterans Hospital	Bath, N. Y.	Irwin & Leighton	Veterans Bureau
15 Buildings, State Hospital	Gowanda, N. Y.	C. F. Haglin & Sons, Inc.	W. E. Haugaard
U. S. Veterans Hospital	Little Rock, Ark.	McGregor & Pickett	Veterans Bureau
Lord Baltimore Hotel	Baltimore, Md.	Consolidated Engineering Co.	W. L. Stoddart
U. S. Veterans Hospital	Perry Point, Md.	North-Eastern Construction Co.	Veterans Bureau
Abraham Lincoln Hotel	Reading, Pa.	Hunkin-Conkey Construction Co.	W. L. Stoddart
U. S. Veterans Hospital	Kecoughtan, Va.	Virginia Engineering Co.	Veterans Bureau
U. S. Veterans Hospital	Lexington, Ky.	J. A. Jones Construction Co.	Veterans Bureau
Charity Hospital of Louisiana	New Orleans, La.	Geo. A. Fuller Co.	Weiss, Dreyfous & Seiferth
U. S. Veterans Hospital	Togus, Me.	Doyle & Russell	Veterans Bureau
U. S. Veterans Hospital	Dearborn, Mich.	Cooper-Little Co.	Veterans Bureau
U. S. Veterans Hospital	Camp Custer, Mich.	E. W. Sproul Construction Co.	Veterans Bureau
Royal York Apartments	Columbus, Ohio	Nelson-Pedley, Inc.	Thalheimer & Weitz
U. S. Veterans Hospital	Chillicothe, Ohio	James I. Barnes Const. Co.	Veterans Bureau
Mt. Carmel Mercy Hospital	Detroit, Mich.	Darin & Armstrong	Marr & Sullivan
U. S. Veterans Hospital	Roanoke, Va.	A. Farnell Blair	Veterans Bureau

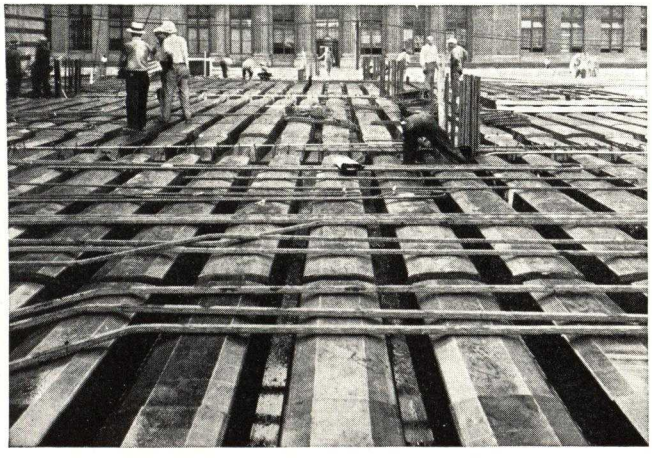
REMOVABLE STEEL FORMS FOR CONCRETE JOISTS

Description

Structural steel channel soffits combined with 14-gauge smooth type pans in long lengths and a system of shoring which permits pans to be removed while shores remain in place. Note illustration above showing double taper pans and channels, bridging joist and method of centering. Our quotations include not only lease and erection of pans, but all centering underneath same. Further details upon request.

Advantages

Forms are sufficiently heavy so that there are no deflections or indentations. Structural steel soffits insure straight, true lines and tight joints. No leakage of concrete. No re-shoring is required, and all shores are superimposed directly above each other, providing maximum safety. Shores are far enough apart to provide ample working space for other trades. Extremely rapid progress schedules can be maintained.



Hausman Steel Forms in Place, General Motors Research Building, Detroit, Mich.
ALBERT KAHN, Architect
O. W. BURKE CO., Contractors

Typical Hausman Steel Form Installation, Mt. Pleasant Senior High School, Providence, R. I.
PUBLIC WORKS DEPARTMENT, Architects
CHAS. T. WILLS, INC. and TUCKER CONST. CO., INC., Contractors

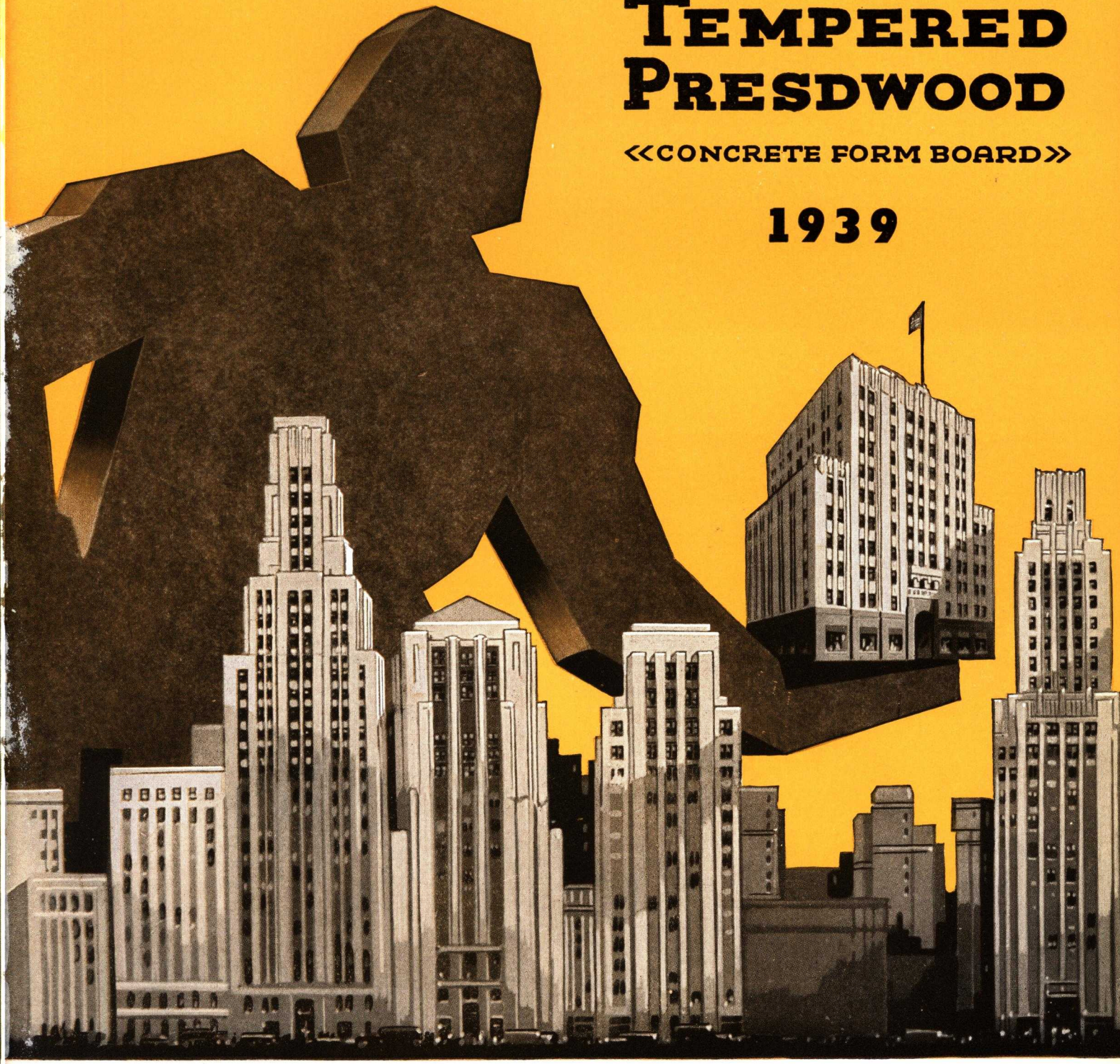
MEMORANDA

Genuine

MASONITE TEMPERED PRESDWOOD

«CONCRETE FORM BOARD»

1939



MASONITE *Corporation*

111 *W. Washington Street*, CHICAGO, ILLINOIS

MASONITE Corporation

111 W. Washington Street, CHICAGO—ILLINOIS.

FOR CATALOG ON **MASONITE STRUCTURAL INSULATION** *See Sweet's File Index*

MASONITE TEMPERED PRESDWOOD (CONCRETE FORM BOARD)

Why You Should Specify It

Two requisite characteristics of concrete are strength and durability. To secure these characteristics, it is necessary that the concrete be thoroughly and completely hydrated. Perfect hydration can be obtained only when forms that retain the mixing-water and maintain the established water cement ratio during the early stages of curing, are used. Properly constructed forms of Masonite Tempered Presdwood retain the mixing-water, thereby insuring the complete and uniform hydration of the concrete mass during the early stages of curing.

Tempered Presdwood forms not only insure better concrete, but also effect substantial economies, as there are numerous instances in which they have been reused upward of twenty times, and some cases in which they have been reused upward of thirty times.

An understanding of what Masonite Tempered Presdwood is, will immediately explain why it serves so well in concrete form work.

INTRODUCTION

A Tried and Proved Material

The increasing demand and successful use of Masonite Presdwood for the lining of concrete forms to economically produce smooth, finished, exposed concrete surfaces, led the Research and Development Department of the MASONITE CORPORATION to further develop and perfect this material to more particularly adapt it to this use.

This fine material, Tempered Presdwood, should in no way be confused with the previously made board, still admirably adapted to many uses in building and other industries.

Tempered Presdwood is much denser, less absorptive and of considerably greater structural strength than Standard Presdwood.

To the long and favorably known unique qualities of Presdwood have been added almost unbelievable new qualities of tough, wear-resisting ruggedness and strength.

Made of Exploded Wood

Masonite Tempered Presdwood is a manufactured board, made entirely of wood fibres by the Mason Process (Patented).

No binders are added and no chemicals are used in its manufacture.

Clean wood chips (yellow pine) are exploded under high steam pressure. This first stage in the manufacturing process produces long cellulose fibres with their original strength unimpaired and the lignin or natural cementing constitutent of the wood entirely retained. The exploding process is purely physical, not chemical, and there is no change in the wood except that it is torn apart into exceptionally long fibres.

These clean, long fibres are next thoroughly felted together and compressed into boards 4 feet by 12 feet in steam heated, flat-bed hydraulic presses where they are subjected to tremendous pressure and at the same time to a high temperature. In four ways the board thus produced is better than nature's own original material. It is both grainless and knotless, has greater moisture resistance and is much denser and tougher.

The compressed or finished boards (Masonite Presdwood) are tempered by a patented process which adds unbelievably to their density, non-absorption, structural strength and toughness. The result is a board of uniformity in thickness and physical properties. The face surface of the board is smooth and semi-polished. The reverse surface is screen-mesh-indented.

THE COMPANY *Manufacturing Facilities*

The MASONITE CORPORATION has been continuously in business since 1925. All of its products, "Masonite Insulation," "Quartrboard," "Presdwood," the new "Tempered Presdwood," and "Presdwood Temprtile" are produced by the "Mason Process." They are made entirely of pure, clean wood fibre. All of the products are sold nationally through retail lumber merchants.

The Manufacturing Plant is located at Laurel, Miss., with an annual capacity of better than 200,000,000 square feet of its various insulation and hard board products. Reasonable stocks are always maintained at the factory to insure quick delivery for any size operation.

Form Designing Service

The MASONITE CORPORATION maintain a corps of competent engineers to assist in the design and erection supervision of economical concrete forming based on the use of Tempered Presdwood.

Physical Characteristics of TEMPERED PRESDWOOD

SIZE (AREA)

The boards are uniformly 4'x12' cut accurately rectangular in shape with smooth, sharp arrises.

THICKNESS

Form Liner Boards—$\frac{3}{16}$ in. thick.
Structural Form Boards—$\frac{1}{4}$ in. and $\frac{5}{16}$ in. thick.

WEIGHT

$\frac{3}{16}$ in. thick—1100 lbs. per thousand square feet.
$\frac{1}{4}$ in. thick—1400 lbs. per thousand square feet.
$\frac{5}{16}$ in. thick—1700 lbs. per thousand square feet.

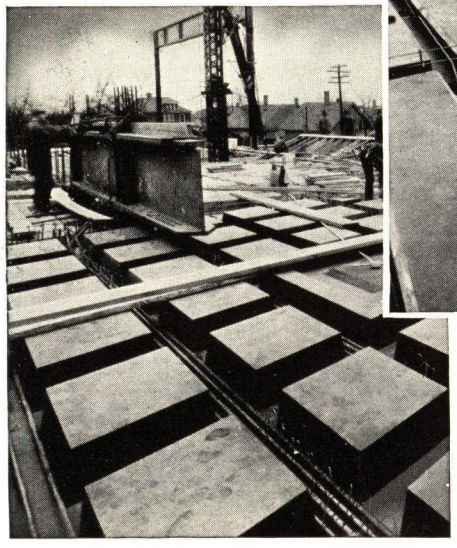
SPECIFIC GRAVITY

The specific gravity of Tempered Presdwood is 1.08, which is greater than Northern Hard Maple.

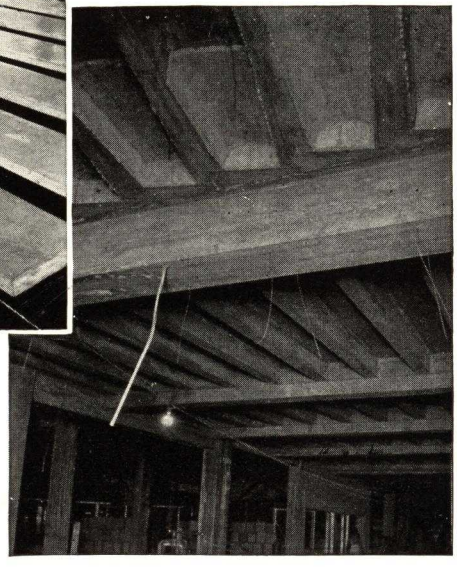
STRUCTURAL STRENGTH

Tensile Strength per square inch....	5,000 lbs.
Modulus of Rupture per square inch.	10,000 lbs.
Working stress per square inch.....	1,250 lbs.
Modulus of Elasticity.....	850,000 lbs.

NORTH EAST Y. M. C. A. NOTE TWO WAY JOIST SYSTEM USED ON THIS PART OF THE BUILDING AND THE ADAPTABILITY OF TEMPERED PRESDWOOD TO THIS SYSTEM



NORTH EAST Y. M. C. A. NOTE STRAIGHT ALIGNMENT AND CLEAN EDGES OF THE CONCRETE JOIST. COMPARE THIS SURFACE WITH THE FOREGROUND METAL PAN SURFACE



NORTH EAST Y. M. C. A. BUILDING —DETROIT, MICH. ARCHITECTS: SMITH, HINCHMAN & GRYLLS—DETROIT. GEN. CONTRACTORS: A. A. ALBRECHT CO.—DETROIT. TEMPERED PRESDWOOD USED AS A FORM LINER ON ALL EXPOSED SLABS, JOISTS AND COLUMNS

Advantages and Economies of MASONITE TEMPERED PRESDWOOD

(Concrete Form Board)

FORM FINISHED CONCRETE—GENERAL ADAPTABILITY

Building Industry for years searched without success for a material wholly suitable for concrete form lining and structural forming which would leave the concrete surface in a smooth, finished condition without added labor and expense.

The development of Tempered Presdwood, a grainless, all-wood fibre board, has through actual use on practically every type of concrete structure, proven its entire practicability and adaptability for this purpose. Tempered Presdwood has all the advantages previously accredited to natural wood lumber with the elimination of all of its inherent disadvantages.

Smooth finished concrete surfaces, both for the interior and exterior, are obviously an economy and may be utilized in practically every type of construction where reinforced and mass concrete are adapted.

On the interior, Form Finished Concrete in columns, beams, girders and slabs forming ceilings requires no plastering or furred or suspended ceilings to cover up or make presentable the structural members. The finished concrete is practically ready for decorating when the forms are removed.

For subways, tunnels and similar construction, a dense, smooth concrete surface is provided.

For exterior exposed building foundations and walls, Form Finished Concrete devoid of the usual form lumber disfigurations, has infinite possibilities. This is particularly true in the case of bridge piers, bridges and viaducts. Tempered Presdwood has proven an ideal form surface for special-process exposed-aggregate concrete wall facings.

Tempered Presdwood boards may be formed to the average curves required for arches and vaults.

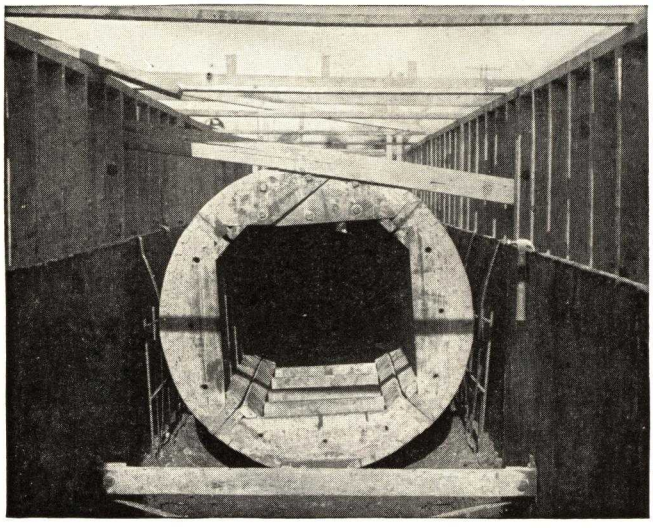
ELIMINATION OF FORM JOINTS, ETC.

Due to the large area of the Tempered Presdwood units (4 ft. x 12 ft.), form joints, which would appear as disfiguring marks and fins on the concrete surface, are entirely eliminated.

Where joints between boards are necessary, they can be practically obliterated if ordinary care is exercised in cutting the boards and matching and securing the edges at the butt. (The manufactured edges of Tempered Presdwood boards are straight and square with sharp, true arrises.) No joint filler is required.

Much of the disfiguring form marks on exposed concrete in the past has been due to moisture absorption which has caused swelling, cupping and bulging of the individual boards of even the most carefully built wood lumber forms.

KALAMAZOO OUTFALL SEWER 6000 LINEAL FT. OF MONOLITHIC CONCRETE SEWER. 4' 6" INSIDE DIAMETER. NO HORIZONTAL JOINTS
OWNER: CITY OF KALAMAZOO, MICHIGAN
ENGINEERS & BUILDERS: CITY ENGINEERING DEPT. OF KALAMAZOO
INTERIOR FORM IN PLACE. NOTE TEMPERED PRESDWOOD PARTIALLY LINING EXTERIOR SKELETON FRAME. IT HAD BEEN USED 21 TIMES WHEN PHOTOGRAPH WAS TAKEN



Since Tempered Presdwood is practically non-absorptive, it remains flat and smooth even after repeated uses.

UNIFORMITY

Tempered Presdwood boards are absolutely uniform in surface finish, density and strength and are accurately cut to dimension.

The material is grainless and therefore has no tendency to split.

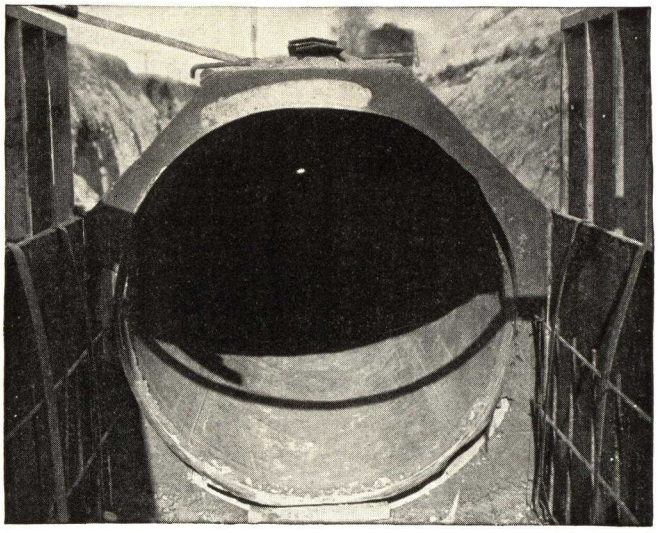
The fibres are uniformly compacted throughout the entire thickness—it is not laminated or stratified, therefore it will not separate or flake transversely.

LIGHT WEIGHT—EASILY HANDLED

While of great structural strength, the boards are thin ($\frac{3}{16}$, $\frac{1}{4}$ and $\frac{5}{16}$ in.) and weigh only 67.2 lbs. for 48 sq. ft. of $\frac{1}{4}$ in. Whether used as lining for wood forms or structurally spanning between wood supports, they are easy to handle and weigh less than any other material possessing comparable characteristics.

A SMOOTH FORM SURFACE

The face of Tempered Presdwood is smooth and has a semi-polished appearance. This is due to the smooth chromium steel platens against which Presdwood is pressed when being made.



The tempering process fills the voids that may be in the surface of the board, increasing both its hardness and smoothness.

ANOTHER VIEW OF KALAMAZOO OUTFALL SEWER SHOWING SECTION OF SEWER HAVING JUST BEEN STRIPPED. NOTE COMPARATIVE SMOOTH SURFACE OF INTERIOR LINING OF SEWER. TEMPERED PRESDWOOD USED 21 TIMES WHEN THIS PHOTOGRAPH WAS TAKEN

RETAINS THE CORRECT WATER CEMENT RATIO

Forms lined with or built of Tempered Presdwood are tight and retain all of the pre-determined moisture within the forms assuring complete, uniform hydration of the cement and, therefore, better concrete.

The full strength of concrete pre-determined by the water cement ratio method is secured.

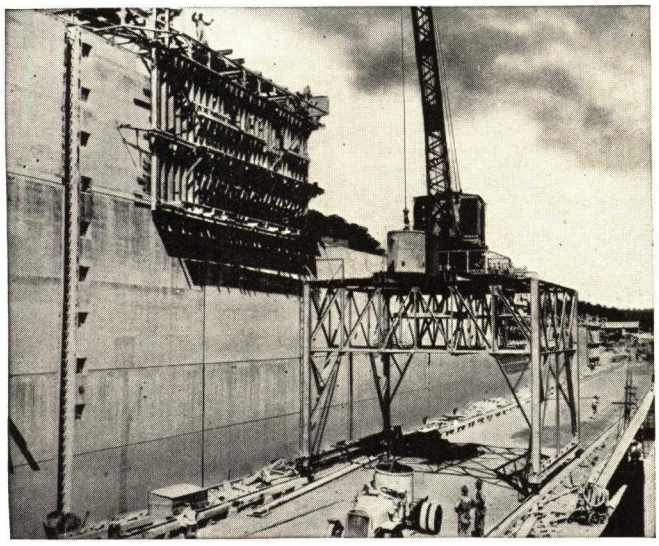
There are few, if any, cracks or joints for the moisture to seep through and practically no moisture is absorbed by the Tempered Presdwood.

TEMPERED PRESDWOOD ENDURES REPEATED USE

The greatest economy in forming may obviously be expected where the form units for floor arches or slabs, joists, beams, girders and columns are designed in sections for easy removal and repeated reuse on similar members. This is particularly so on floor constructions in multi-story buildings.

Column form size reductions on successive stories are easily accomplished with a minimum loss of material and labor.

Eight to twelve reuses of Tempered Presdwood in form units are frequently obtained when reasonable care is exercised in stripping, cleaning, storing, handling, and re-erecting. There have been jobs on which forms have been reused upward of thirty times.



SECTION SHOWING LOWER GUIDE WALL AT DAM No. 3

After the concrete has set sufficiently for form removal, Tempered Presdwood strips easily from the concrete surface.

Tempered Presdwood from large forms may be repeatedly cut down for use in smaller units.

On an average job, 5% is considered a generous allowance for wastage in cutting.

SAVES FORM LUMBER COSTS

Only sound square edged form lumber need be used in conjunction with Tempered Presdwood—dressed and matched material may be entirely eliminated.

Where Tempered Presdwood is used structurally the skeleton wood form bracing or backing may be so arranged as to require little, if any, cutting to length—the ends of alternate boards may be staggered and lapped.

Since the Tempered Presdwood largely prevents the seepage or loss of water from the concrete, the wood bracing or backing lumber remains in good condition (out of contact with moisture) and with ordinary care in stripping and handling, the salvage and reuse is very considerably increased.

Under average conditions 85% salvage of the supporting wood form lumber is not unusual.

WOOD ACCESSORIES FOR ARCHITECTURAL EFFECT

Where the design requires it, reverse wood moulding forms are easily and inexpensively added to Tempered Presdwood forms to provide ceiling panels, beam and girder crown moulds, beam soffit chamfers and panels and column chamfers.

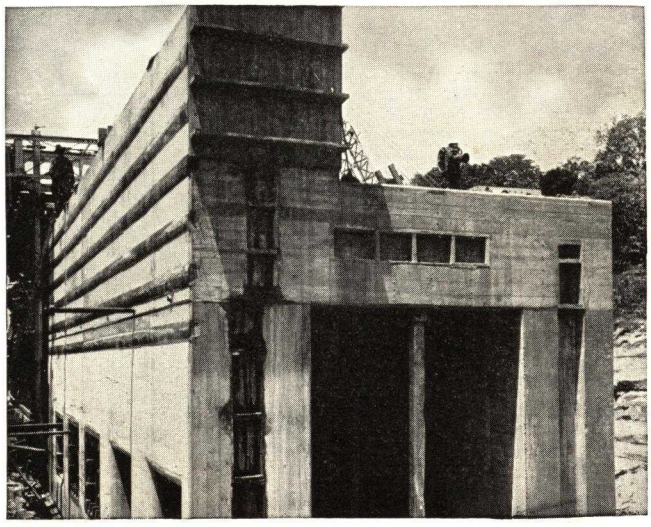
These accessories should be carefully fitted, particularly at miters and intersections and thoroughly oiled to reduce moisture absorption.

SAWING TEMPERED PRESDWOOD

Tempered Presdwood, due to its density and grainless composition, is best cut with a power saw. The saw blade should be an 88-tooth, 14 inch diameter, 10 gauge, for straight saws and 8-13-8 gauge for mitre ground saws and such equipment will give the greatest efficiency for the longest period of time.

For cutting Tempered Presdwood the saw blade should be raised from one-half (½) inch to three-quarters (¾) inch above the surface of the board. The pitch is considerably lengthened and is instrumental in speeding the

LOCK WALLS ON LOCK AT DAM NO. 3 TENNESSEE RIVER, CHATTANOOGA DISTRICT, WERE POURED IN FORMS LINED WITH GENUINE MASONITE TEMPERED PRESDWOOD.



cutting of Tempered Presdwood Board.

TYPE OF CONCRETE REQUIRED

A uniform, extremely plastic concrete mix should always be used, well spaded to assure complete elimination of air and provide full contact with the form face. The whole mass should be puddled, agitated or vibrated by artificial means where concrete is closely confined in comparatively narrow members.

INSPECTION OF FORMS

The best of exposed concrete surfaces can be obtained by a minimum of added care and expense in form construction and proper care and treatment of the forms. Finished forms should always be inspected to insure tight butted joints of the Tempered Presdwood and any foreign substance clinging to the surface of the forms should be removed.

MASTER SPECIFICATIONS

TEMPERED PRESDWOOD FOR CONCRETE FORMS

Note: Notes are explanatory or advisory only and are not to be included in the specifications.

Note: Select and include only those clauses which apply to the particular work. Words or clauses within brackets in italics are selective.

GENERAL REQUIREMENTS

(1) WORK INCLUDED

The following concrete surfaces shall be so executed that the exposed faces shall be "Form Finished," smooth and true, devoid of surface irregularities, disfigurement or markings without the necessity of rubbing, grinding, tooling or other mechanical finishing.

Note: Here list and locate all areas of "Form Finished Concrete." Contractor to take advantage of the structural strength of Tempered Presdwood.

MONTGOMERY WARD BUILDING, DENVER, COLORADO. EXPOSED FACE OF EXTERIOR WALL FORMS WERE LINED WITH TEMPERED PRESDWOOD, TOUGH AND NON-WARPING, FOR "FORM FINISHED" CONCRETE REQUIRING NO TOOLING OR RUBBING AFTER FORM STRIPPING

(2) FORM FACING MATERIAL

(2a) Forms for "Form Finished Concrete" shall be faced with Tempered Presdwood as manufactured by the MASONITE CORPORATION, 111 W. Washington Street, Chicago, Illinois.

(2b) Boards shall be 4 ft. x 12 ft. in area with square-cut, straight edges and sharp arrises; $\frac{3}{16}$ in. for form lining and $\frac{1}{4}$ in. or $\frac{5}{16}$ in. thick for structural forms as best adapted to the particular type of concrete construction.

(3) APPLICATION OF TEMPERED PRESDWOOD—GENERAL REQUIREMENTS

(3a) For surfaces to be painted or surfaces to be left smooth, not rubbed, use the smooth face of the board in contact with the concrete. For surfaces to be rubbed, use the screen face of the board next to the concrete.

(3b) Approximately 24 hours before applying the Presdwood, thoroughly wet with water the screen side of the board. Stack the boards, screen side to screen side, in the pile before using.

(3c) Boards shall be so disposed and of such sizes as to eliminate all unnecessary joints between board areas.

(3d) All joints between boards shall be butted tight. Do not spring or force the boards in place.

(3e) The edges of Tempered Presdwood boards, cut on the job, shall be straight, true and clean to produce a smooth, even edge where butted at joints.

(3f) All butt joints shall be rigidly supported for their full length to prevent movement.

(3g) All curved surfaces shall be formed accurately.

(3h) Nail Tempered Presdwood using three-penny cement coated, casing head nails or 3d blued lath nails. Space nails staggered through the center of board on 6″ or 8″ centers. Along all four edges space nails approximately 4″ on centers. Always nail from the center of the board out to the edges.

(3i) Tempered Presdwood may be reused as many times as will provide a continuous, smooth surface.

(4) FORM OILS AND GREASES

Before each use, Tempered Presdwood Forms shall be wiped with waste saturated with grease having a calcium soap or aluminum stearate base, or with waste dipped in paraffin base oil having a viscosity of 145 (Saybolt) or over, free from volatile constituents. These are obtainable under various trade names from Standard Oil Co., Shell Oil Co., Texas Oil Co., Gulf Refining Co., and other refiners. Do not use an excess of oil.

(5) WOOD ACCESSORIES

Wood accessories, such as reverse crown moulds, panel moulds, chamfers, etc. shall be accurately and smoothly milled to produce smooth finished concrete surfaces. They shall be so secured in conjunction with the Tempered Presdwood form facing as to form unbroken lines with all joints, miters, etc. accurately and closely fitted. Wood accessories shall be well oiled with a good grade of form oil before use and shall be maintained in a fairly waterproof condition throughout the work.

(6) FORM LUMBER

Form lumber used in conjunction with Tempered Presdwood form facing shall be sound material of sufficient size and so spaced as to adequately support the loads to be carried without deflection.

(7) STRIPPING

Care should be exercised in stripping the forms from the finished concrete that the Tempered Presdwood edges and face surfaces are not injured in any way to preclude their reuse.

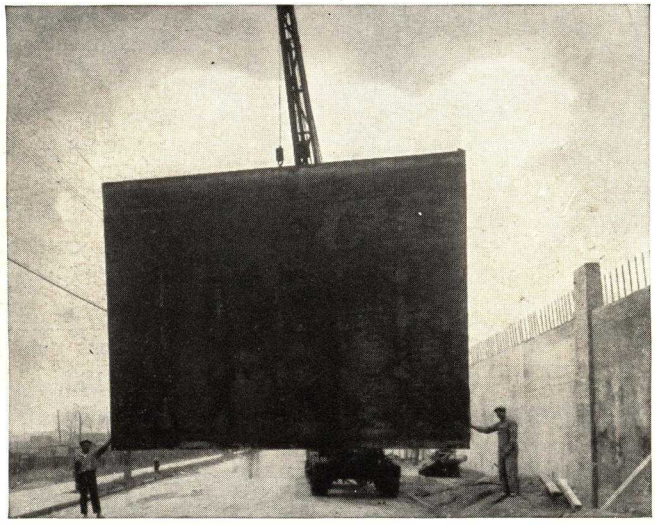
(8) CLEANING AND CARE OF TEMPERED PRESDWOOD

(8a) Tempered Presdwood forms when stripped from the concrete shall be set face down until dry.

(8b) Brush the face vigorously with a fibre scrubbing brush. Wipe the forms with oil or grease as specified in paragraph (4). Do not use an excess amount of oil.

(8c) Tempered Presdwood boards when finally removed from forms at completion shall be carefully stacked face down for subsequent reuse. When dry clean the faces. Adequately protect the edges from injury or abuse. All nails shall be carefully backed out and removed before stacking. Tie wire, tie bolt or other holes which will deleteriously affect reuse, shall be patched and filled level with Rutland patching plaster sanded smooth. When dry coat with grease.

LINDEN BLVD. UNDERCROSSING, LIVONIA AVE. YARD, NEW YORK CITY. 1400 LINEAL FT. OF 19 FT. HIGH WALL. 20 x 24 FT. PANEL, LINED WITH ONE-QUARTER INCH TEMPERED PRESDWOOD, LIGHTWEIGHT PERMITTED TRANSPORTATION AND EASY ERECTION. 25 REUSES OBTAINED



(9) INSPECTION OF FORMS

Immediately before placing concrete the forms shall be carefully inspected to make sure that they are properly braced, sufficiently rigid and thoroughly cleaned of any foreign matter in contact with or adhering to the Tempered Presdwood form face.

(10) CONCRETE CONSISTENCY

Wherever "Form Finished Concrete" is specified, provide an exceedingly plastic concrete to insure smooth finished surfaces free from honey-comb or similar defects.

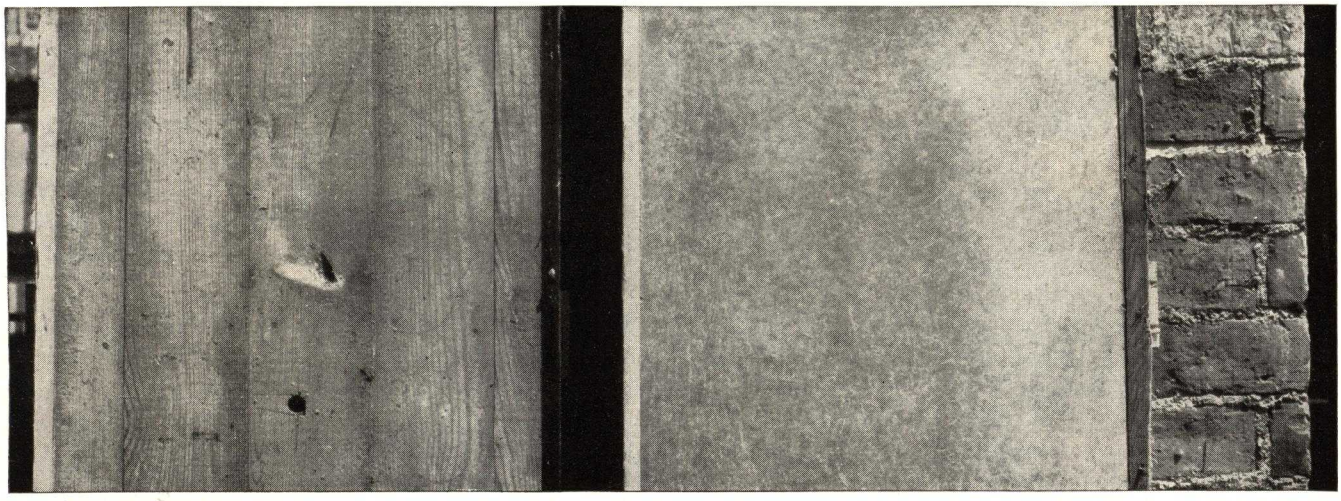
Note: Concrete should not be over sanded to produce plasticity.

(11) PLACING CONCRETE

(11a) All concrete placed in Tempered Presdwood forms should be well spaded at form sides to assure full and uniform contact with the form face. Use wood rod for spading.

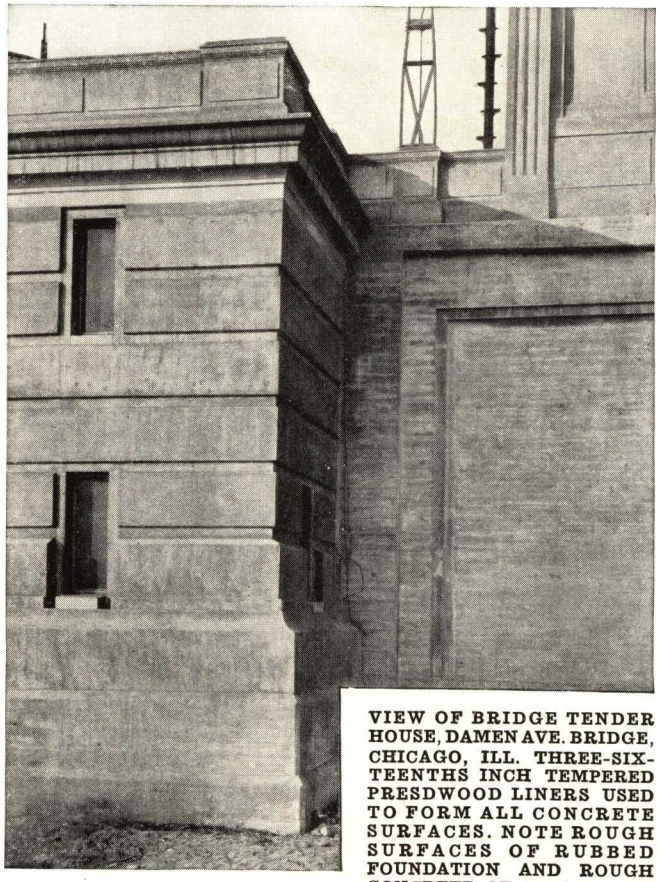
(11b) Thoroughly rod, agitate or vibrate the concrete in closely confined form areas.

(11c) Mass concrete shall be thoroughly puddled.

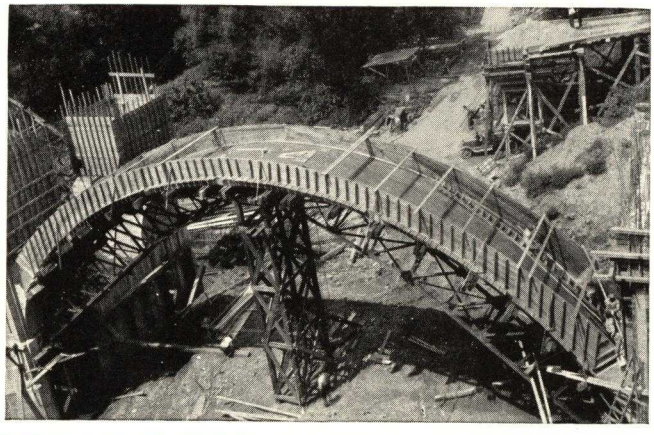


THE ILLUSTRATION ABOVE IS FROM AN UNRETOUCHED PHOTOGRAPH OF STRIPPED CONCRETE COLUMNS. THE COLUMN AT THE LEFT WAS FORMED WITH BETTER THAN AVERAGE STANDARD FORM LUMBER. THAT AT THE RIGHT WAS FORMED WITH MASONITE TEMPERED PRESDWOOD FORMS. NOTE THE SMOOTH FINISHED SURFACE OF THE "FORM FINISHED CONCRETE" JUST AS IT APPEARS WHEN THE FORMS ARE STRIPPED

SHORT FORM SPECIFICATION
For CONCRETE FORMING



VIEW OF BRIDGE TENDER HOUSE, DAMEN AVE. BRIDGE, CHICAGO, ILL. THREE-SIXTEENTHS INCH TEMPERED PRESDWOOD LINERS USED TO FORM ALL CONCRETE SURFACES. NOTE ROUGH SURFACES OF RUBBED FOUNDATION AND ROUGH CONCRETE OF APPROACHES



BALTIMORE ST. BRIDGE, BALTIMORE, MD. ENGINEER: H. L. LUCKE, CITY BRIDGE ENGINEER. CONTRACTORS: THE W. C. BRIDDEL CO., BALTIMORE

MASONITE TEMPERED PRESDWOOD ONE-QUARTER INCH THICK USED TO LINE ARCHES AND SLABS. NOTE SMOOTH PRESDWOOD LINER IN PLACE ON ARCH SOFFIT

FORMS FOR EXPOSED CONCRETE

Forms for all exposed interior and exterior concrete surfaces, including concrete surfaces that are to be painted, shall be lined with Masonite Tempered Presdwood or Masonite Concrete Form Board as manufactured by the Masonite Corporation, 111 W. Washington Street, Chicago, Illinois or equal, not less than $\frac{3}{16}$ in. thick with a hard, smooth surface on one side.

The wood fibre board shall be specially processed to resist moisture.

Boards shall be of sizes as large as practical so as to obtain a minimum number of joints.

They shall be applied to the wood form construction with the smooth side against the concrete, and nailed so as to secure them properly.

Where rubbing is required to produce a uniform surface color it is recommended that the boards be applied to the wood form construction with the screen side against the concrete.

All joints shall be butted tight and shall bear on solid construction.

The entire installation shall provide for exposed concrete surfaces which will be practically free from jointmarks, lumber grain marks, fins, depressions, or other defects which would not insure a continuous smooth surface.

Bevels shall be formed of smooth straight grained wood and shall be nailed through the fibre board and into the backing.

Before using and between reuses, the forms shall be wiped with waste saturated with grease having a calcium soap or aluminum stearate base or with waste dipped in paraffin base oil having a viscosity of 145 (Saybolt) or over, free from volatile constituents. These are obtainable under various trade names from many large refiners.

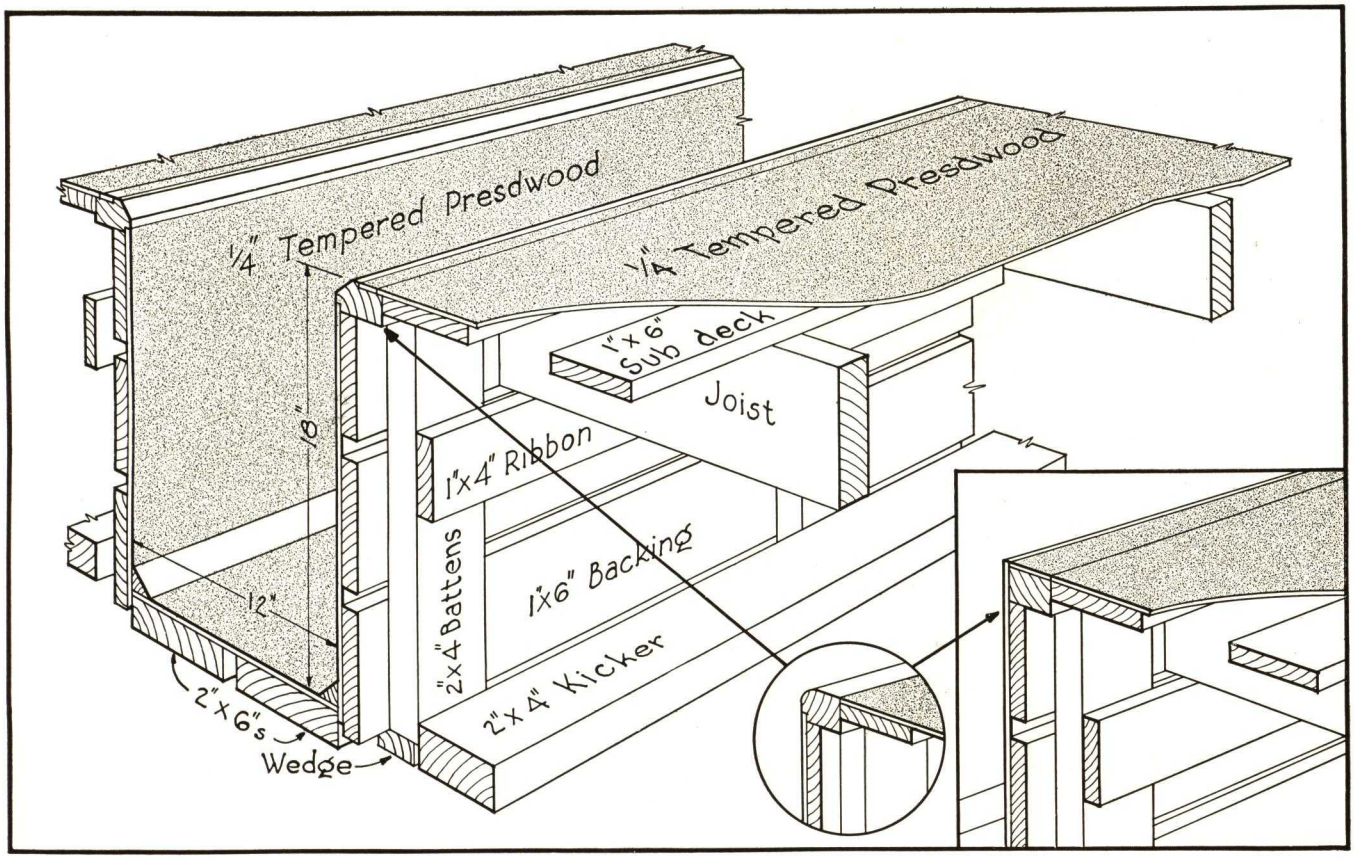
The board shall only be reused as many times as will insure such continuous smooth concrete finish.

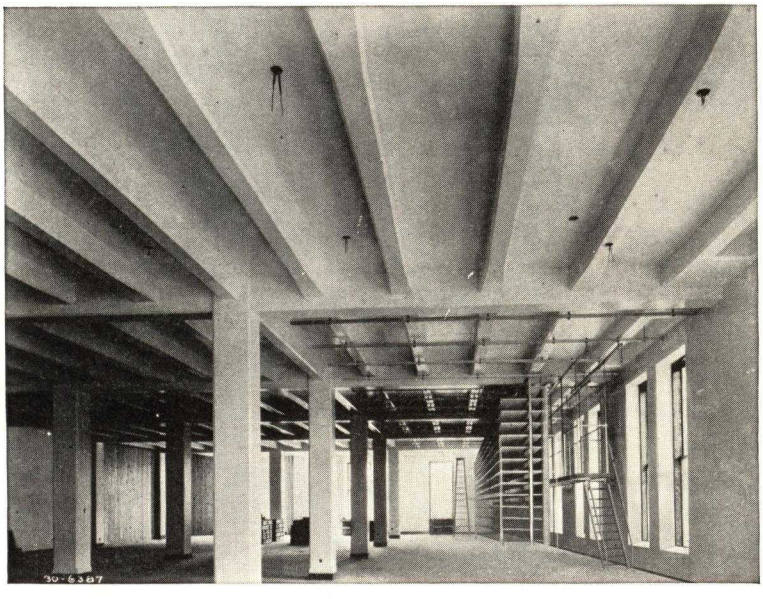
Special care shall be taken in pouring concrete against fibre board to insure the finished surface required.

The manufacturers' specification shall be considered a part of this specification and shall be consulted for further information or instructions.

CONCRETE BEAM AND SLAB FORM

USING 1/4" TEMPERED PRESDWOOD STRUCTURALLY

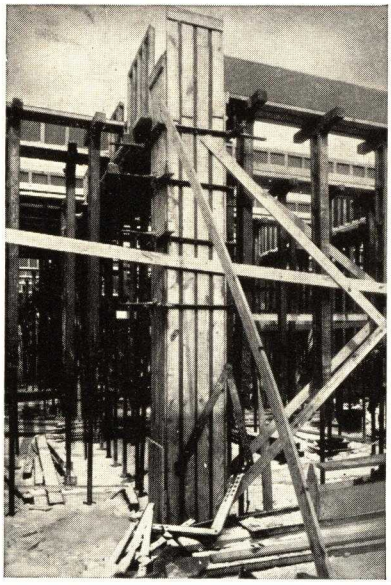


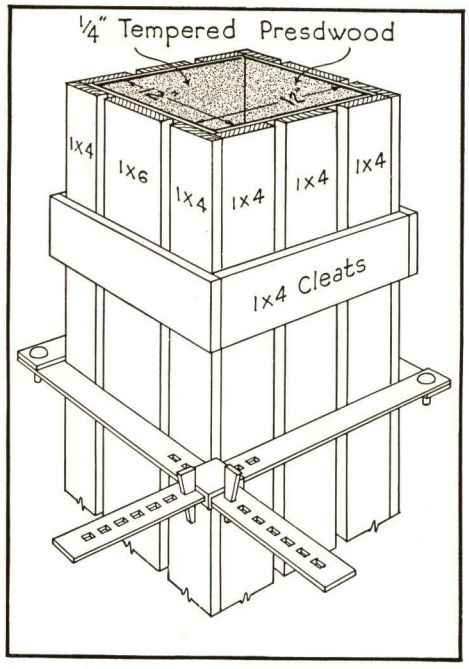


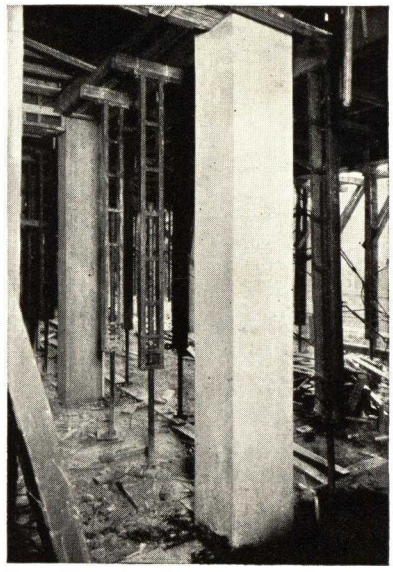
DAYTON BELL TELEPHONE BUILDING, DAYTON, OHIO. R. H. BLAGG, CONTRACTOR. SHENCH & WILLIAMS, ARCHITECTS. ALL COLUMNS, BEAMS, GIRDERS AND SLABS ARE EXPOSED CONCRETE. SURFACES PRODUCED WITH MASONITE TEMPERED PRESDWOOD AND PAINTED

CONCRETE COLUMN FORM

USING ¼" TEMPERED PRESDWOOD STRUCTURALLY

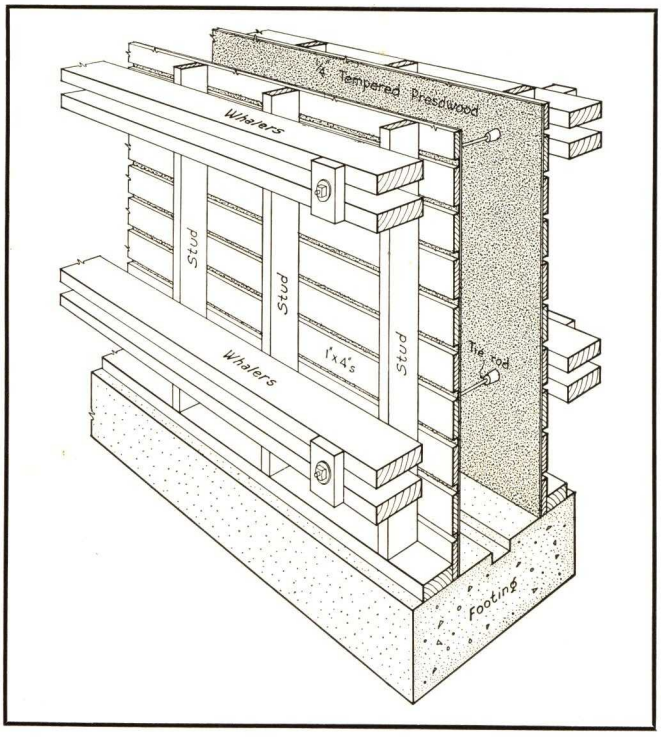






At left—A typical column form in place.

At right—Concrete column with forms stripped. Note the uniform surface and sharp corners.



CADET BARRACKS, RANDOLPH FIELD, TEXAS

TEMPERED PRESDWOOD USED TO LINE ALL FORMS FOR THE PORCH SLABS AND BEAMS. SURFACE MARKED OFF IN 4 x 4 FEET TILES

AT LEFT—CONCRETE WALL USING ¼ IN. TEMPERED PRESDWOOD STRUCTURALLY. OPEN SHEATHING NOT EXCEEDING 4 IN. CAN BE USED WHEN POURING NOT MORE THAN 3'-0" PER HOUR IN WALL HEIGHT OR THE EQUIVALENT OF A HYDROSTATIC PRESSURE OF 450 LB. PER SQ. FT. OF WALL SURFACE

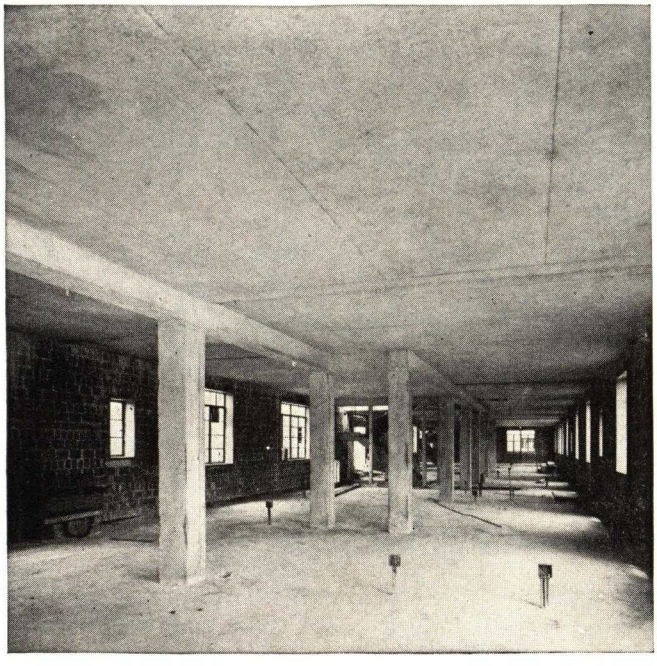
CONCRETE FLOOR SLAB FORM

SHOWING STEP-BY-STEP CONSTRUCTION IN A LARGE HOUSING PROJECT

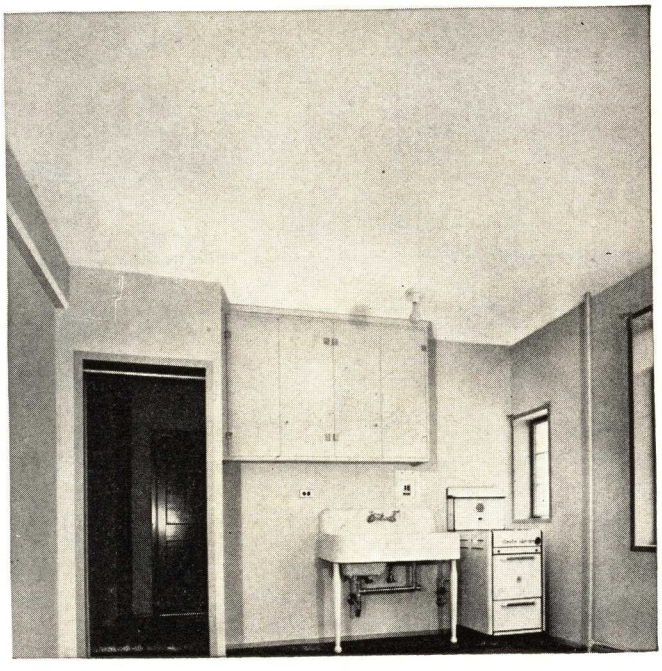
CONCRETE FLOOR SLAB FORMS IN THE LAUREL HOMES HOUSING PROJECT, CINCINNATI, OHIO. DAVID GORDON BUILDING AND CONSTRUCTION CO. WERE THE GENERAL CONTRACTORS AND THE ADJUSTABLE FORMS CO., MINNEAPOLIS, MINN., WERE THE SUB-CONTRACTORS.

AT RIGHT—UNDERSIDE OF FLOOR SLAB FORMS. MASONITE TEMPERED PRESDWOOD FORM PANELS SUPPORTED ON STEEL JOISTS IN PLACE READY TO POUR CONCRETE

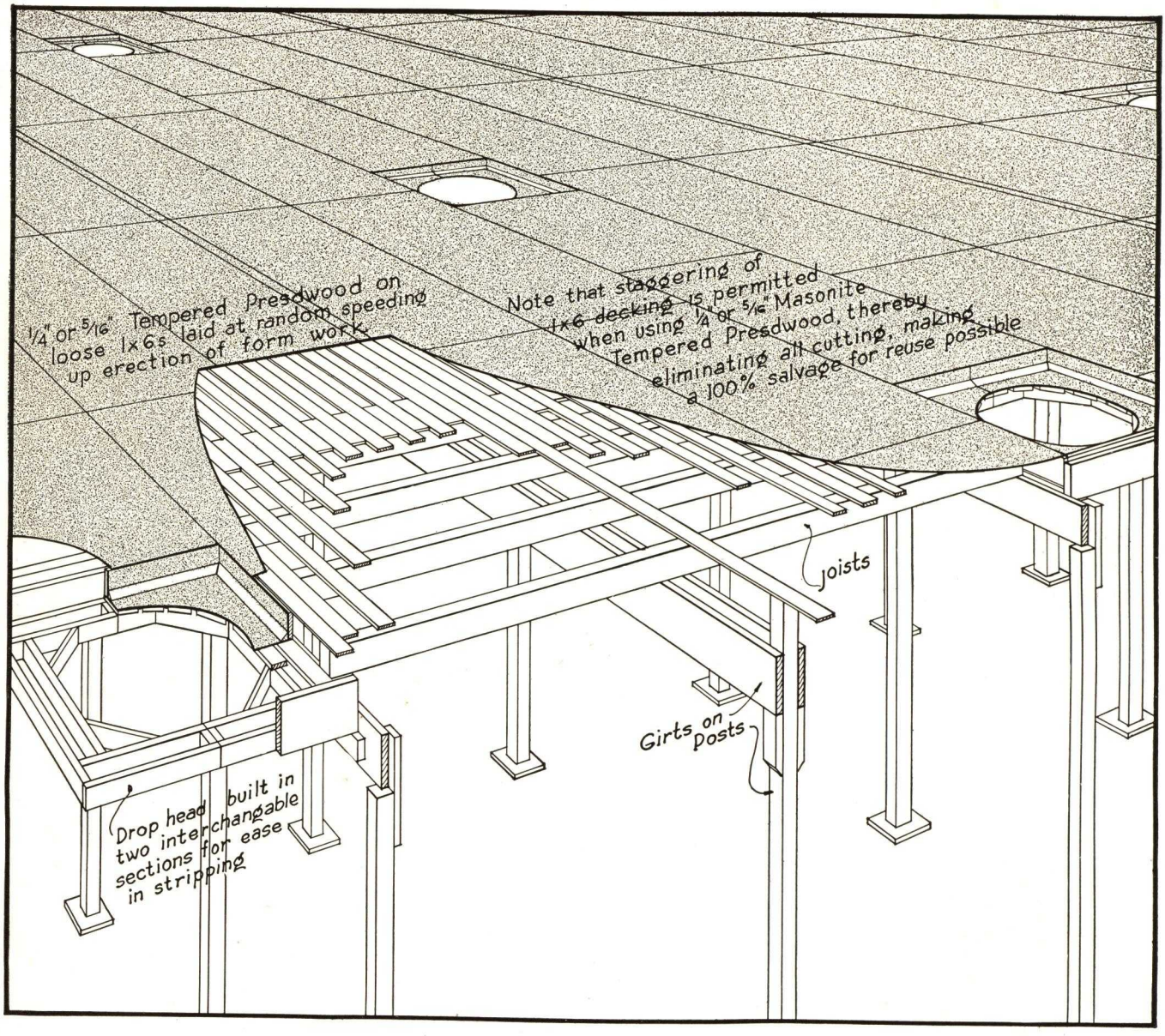
BELOW—UNRETOUCHED PHOTOGRAPH SHOWING THE UNDERSIDE OR CEILING OF SLAB WITH FORMS REMOVED. THIS SMOOTH, DENSE CONCRETE PRESENTS AN IDEAL SURFACE FOR PAINTING DIRECTLY ON THE FINISHED CONCRETE



BELOW—PAINTING DIRECTLY ON THE CONCRETE SURFACE AND ELIMINATING THE PLASTER PRESENTS THIS VERY PLEASING APPEARANCE. NOTE STRAIGHT, TRUE LINE OF BEAM FORMED WITH TEMPERED PRESDWOOD



FLAT SLAB CONSTRUCTION



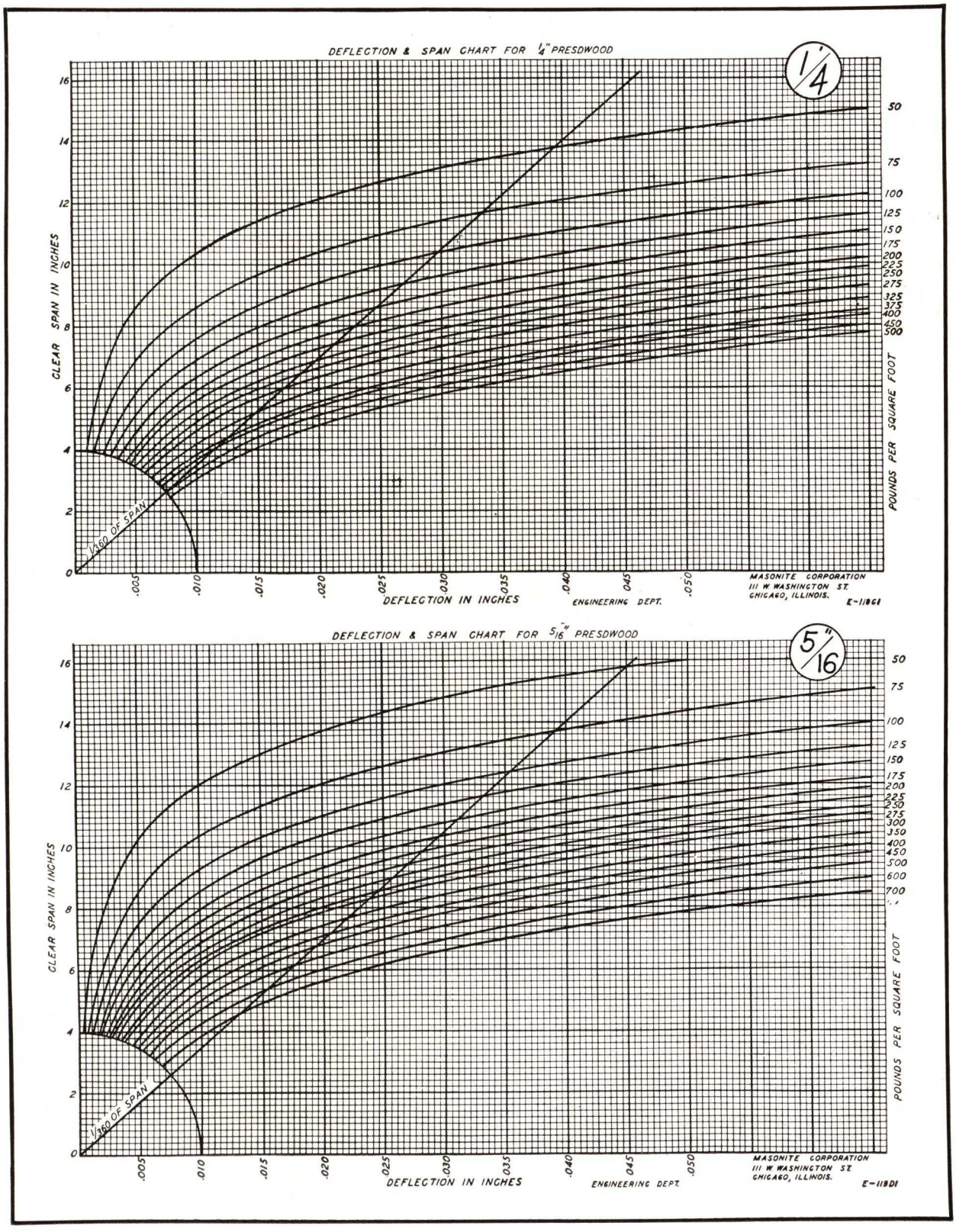
TYPICAL EXAMPLE FOR THE USE OF DEFLECTION CHARTS

(See Charts on Opposite Page **12***)*

The Contractor has a solid 8-in. concrete slab floor to form. He wishes to know how far apart he can space his 1 x 4's or 1 x 6's to get within the allowable limits of deflection. Usually the allowable deflection limit for floors is 1/360th of the span. An 8-in. concrete slab floor weighs 100 pounds per sq. ft. of floor. Add to this a working stress of 75 pounds per square foot, making a total of 175-pound load that the Tempered Presdwood board must support, within the deflection limits.

On the stress diagram for 1/4-in. Tempered Presdwood, intersect line marked 1/360 of span and curve marked 175 pounds. From this intersection follow the horizontal line to the left margin and it will be found that the support spacing may be as great as 8 in. Refer to the diagram for 5/16-in. Tempered Presdwood; repeat the above operation and it will be found that supports may be spaced 10 1/4 in. Then determine which thickness of Tempered Presdwood will serve best.

DEFLECTION CHARTS FOR TEMPERED PRESDWOOD



Genuine

MASONITE TEMPERED PRESDWOOD

«CONCRETE FORM BOARD»

1939

MASONITE *Corporation*

111 *W. Washington Street,* CHICAGO, ILLINOIS

SECTION 3

CONTINUED ⟶

AMERICAN STEEL & WIRE COMPANY

UNITED STATES STEEL

Manufacturers of Wire Fabric Reinforcement

SALES OFFICES

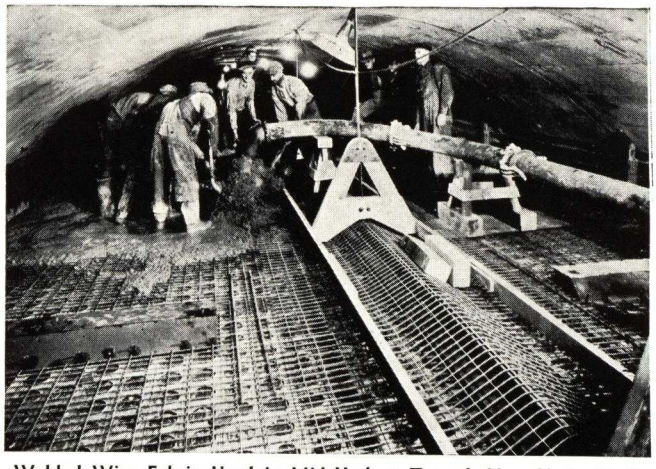
ATLANTA, 101 Marietta St. Building
BALTIMORE, First National Bank Building
BIRMINGHAM, Brown-Marx Building
BOSTON, Statler Building
BUFFALO, Liberty Bank Building
CHICAGO, 208 So. La Salle Street
CINCINNATI, Union Trust Building
CLEVELAND, Rockefeller Building
COLUMBUS, American Insurance Union Building
DALLAS, Praetorian Building
DENVER, First National Bank Building
DETROIT, General Motors Building
EL PASO, First National Bank Building
HOUSTON, Petroleum Building
KANSAS CITY, 417 Grand Avenue
MEMPHIS, Sterick Building
MILWAUKEE, Bankers Building
MINNEAPOLIS—ST. PAUL, First National Bank Building, St. Paul
NEW YORK, Empire State Building
PHILADELPHIA, Broad Street Station Building
PITTSBURGH, Frick Building
SALT LAKE CITY, Walker Bank Building
ST. LOUIS, 506 Olive Street
WILKES-BARRE, Miners Bank Building
WORCESTER, 94 Grove Street
*SAN FRANCISCO, Russ Building
*LOS ANGELES, 2087 E. Slauson Avenue
*PORTLAND, 2345 N. W. Nicolai Street
*SEATTLE, 1054 Fourth Avenue So.

*PACIFIC COAST DISTRIBUTORS: COLUMBIA STEEL COMPANY

EXPORT DISTRIBUTORS: UNITED STATES STEEL PRODUCTS COMPANY, 30 Church Street, NEW YORK, N. Y.

USES

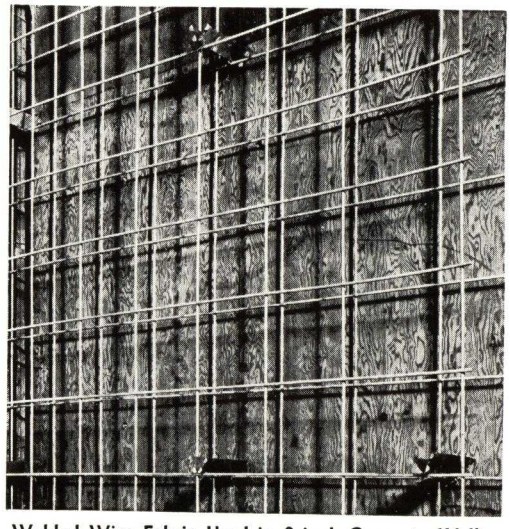
USS Triangle Mesh and Electrically Welded Wire Fabric are used for the reinforcing of concrete floor and roof slabs, concrete walls and chimneys, arch construction, beams, columns, dams and retaining walls, water, sewer and culvert pipe, pavements and roadways, river revetment, silos, fireproofing steel framing, bridge floors, reservoirs, monolithic concrete sewers and stucco work.



Welded Wire Fabric Used in Mid-Hudson Tunnel, New York, N. Y. Pouring the Ceiling Slab

ADVANTAGES OF WIRE FABRIC REINFORCEMENT

(1) Provides even distribution of steel.
(2) Reinforces in every direction.
(3) Tension or carrying members accurately spaced.
(4) Low cost inspection.
(5) Properly distributes over a large area stresses due to concentrated load.
(6) Due to cold drawing, higher elastic limits with same quality of steel.
(7) Continuous action from one end of the structure to the other.
(8) Impossible to leave out or otherwise reduce the necessary steel if specific style number of fabric or area of steel is specified.
(9) Perfect mechanical bond.
(10) Easily handled and stored on the job.
(11) Minimum cost of installation.
(12) More bond area provided for equivalent steel area because of its small members closely spaced.



Welded Wire Fabric Used in 8-inch Concrete Walls, Chicago Post Office, Chicago, Ill.

GRADE OF STEEL

Cold drawing of mild steel produces a high ultimate strength and increases the yield point from 60 per cent to 90 per cent of the ultimate strength. Since the strength of a reinforced concrete structure, in-so-far as the reinforcement is concerned, depends on the yield point and mechanical bond of the steel, the high yield point and increased bond area of cold drawn wire fabric is of great importance. A working stress of 30,000 lbs. per sq. in. is recommended where permitted by building codes.

FLOOR CONSTRUCTION BEAM AND SLAB TYPE

Beam and slab or short span type of floor construction with reinforced concrete slabs supported by reinforced concrete beams or steel beams is used extensively for office, hotel, apartment and factory building construction. See Slab requirements shown in Table No. 9.

New York City Building Code, effective date January 1, 1938, reads as follows:

10.3.2.4 Strength of Concrete Floor and Floor Construction "Unless designed in accordance with 8.5 *Reinforced Concrete Construction,* the safe carrying capacity of concrete floor and roof construction shall be determined by the following formula:

$$w = \frac{3\ C\ A_s}{L^2}$$

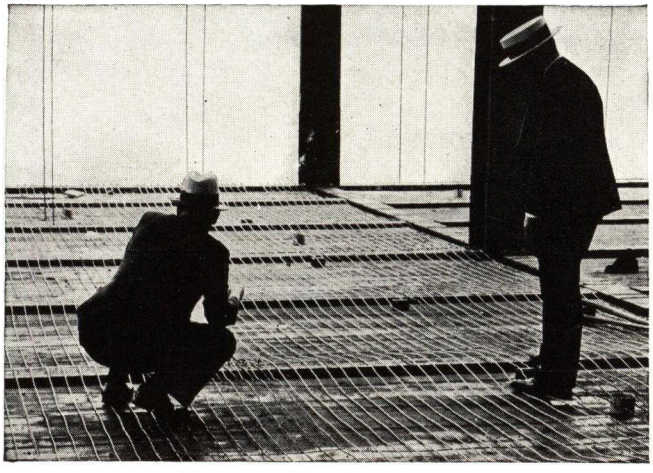
in which

w = gross uniform floor load in pounds per square foot.

A_s = cross-sectional area of reinforcement in square inches per foot of width of slab.

L = clear span in feet between steel flanges and shall not exceed 10 feet in any case, and when the gross floor load exceeds 200 pounds per square foot the span shall not exceed eight feet.

C = the following coefficient, for steel having an ultimate strength of at least 55,000 pounds per square inch:



Short Span Cinder Concrete Floor Construction, Welded Wire Fabric as Used in Empire State Building, New York, N. Y.

For Cinder Concrete

20,000 when reinforcement is continuous.

14,000 when reinforcement is hooked or attached to one or both supports.

For Stone Concrete

15,000 when reinforcement is hooked or attached to one or both supports.

23,000 when reinforcement is continuous.

The use of this formula is forbidden unless.....the slab is at least four inches thick.

If steel of an ultimate strength in excess of 55,000 pounds per square inch is used, the above coefficient may be increased in the ratio of the ultimate strength to 55,000, but at most 30 per cent....."

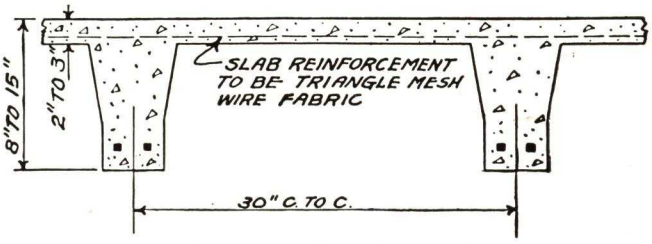
The proposed Building Regulation for Reinforced Concrete, Report of American Concrete Institute Committee 501 Standard Building Code adopted as a tentative Standard February 27, 1936, recommends as a tensile working stress in wire mesh, Sec. 306 under allowable unit stresses in Reinforcement, "Wire Mesh . . . fifty per cent of the minimum yield point as established by A.S.T.M. Standards . . . not to exceed 30,000 lbs. per square inch," and in Section 505—Placing Reinforcement:

Paragraph (b) "When wire.....is used as reinforcement for slabs not exceeding ten feet in span, the reinforcement may be carried from a point near the top of the slab over the support to a point near the bottom of the slab at mid span; providing such reinforcement is either continuous over or securely anchored to the support."

CONCRETE JOIST FLOORS

For long spans and light loads a floor construction consisting of closely spaced concrete ribs and connecting concrete slabs will very often prove to be economical. A typical section of such a floor is shown below. A wire fabric with comparatively close spacing of members is the only logical reinforcement to use for the connecting concrete slabs.

The Proposed Building Regulation for Reinforced Concrete, Report of American Concrete Institute Committee 501 Standard



Typical Section of Concrete Joist Floors

Building Code adopted as a tentative Standard February 27, 1936, recommends Section 708 Shrinkage & Temperature Reinforcement (a) Reinforcement for shrinkage and temperature stresses normal to the principal reinforcement shall be provided in floor and roof slabs where the principal reinforcement extends in one direction only. Such reinforcement shall provide for the following minimum ratios of reinforcement area to concrete area but in no case shall such reinforcing bars be placed farther apart than five times the slab thickness nor more than 18 in.

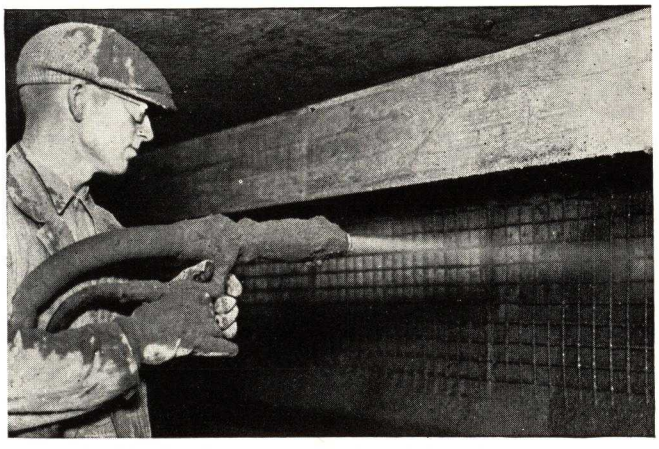
Floor slabs where Plain Bars are used	0.0025
Floor slabs where Deformed Bars are used	0.002
Floor slabs where Wire Fabric is used having welded intersections not farther apart in the direction of stress than 12 in.	0.0018
Roof slabs where Plain Bars are used	0.003
Roof slabs where Deformed Bars are used	0.0025
Roof slabs where Wire Fabric is used having welded intersections not farther apart in the direction of stress than 12 in.	0.0022

CEMENT GUN WORK

Gunite (trade name) is concrete applied by the cement-gun process which produces a dense and waterproof concrete. Experience shows that close-meshed wire fabric is the most efficient and economical form of reinforcement to use.

All kinds of new construction as well as repair work, especially those requiring waterproof qualities with light resulting weight can be successfully executed.

A 2-in. mesh (2-in. spacing cross wires known as "A" Styles) when Triangle Mesh is used or a 2x2-in. or a 3x3-in. welded wire fabric is made for use with the cement-gun or similar work.



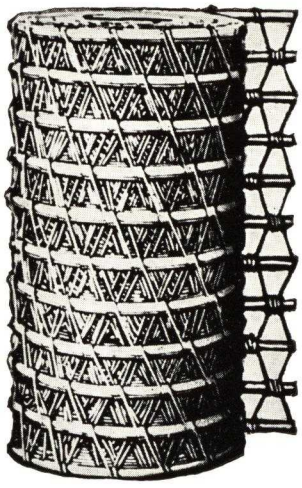
Guniting Operation on Outer Drive Bridge, Chicago, Ill.

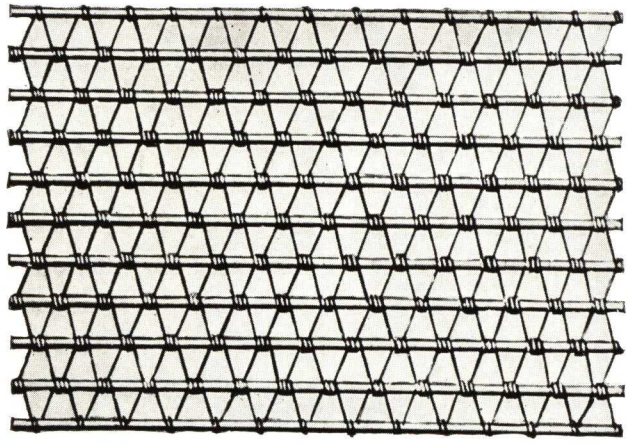
DESCRIPTION OF TRIANGLE MESH REINFORCEMENT

USS Triangle Mesh Woven Wire Reinforcement is made from cold drawn mild steel having a high breaking strength, the longitudinal or tension members are spaced 4 in. the diagonal cross wires either 2, 4 or 8 in.

For the light styles of fabric the longitudinals consist of one wire, for the medium styles two wires and for the heavy styles three wires stranded. The size of the wires is varied to obtain the desired cross sectional area of steel per foot of width.

Triangle Mesh Reinforcement is regularly made in standard rolls but can be furnished straightened and cut to lengths when required.





STANDARD STYLES USS TRIANGLE MESH REINFORCEMENT

TABLE NO. 1

Longitudinals spaced 4 ins. Cross wires 14-gauge spaced 4 ins. Number and gauge of wires, areas per foot width and weights per 100 sq. ft.

Style No.	Number and gauge of wires each longitudinal American Steel & Wire Company's steel wire gauge	Sectional area longitudinals sq. in. per ft. width	Total effective longitudinal sectional area sq. in. per ft. width	Approximate weight, lbs. per 100 sq. ft.
032	1—No. 12 gauge	.026	.032	22
040	1—No. 11 gauge	.034	.040	25
049	1—No. 10 gauge	.043	.049	28
058	1—No. 9 gauge	.052	.058	32
068	1—No. 8 gauge	.062	.068	35
080	1—No. 7 gauge	.074	.080	40
093	1—No. 6 gauge	.087	.093	45
107	1—No. 5 gauge	.101	.107	50
126	1—No. 4 gauge	.120	126	57
146	1—No. 3 gauge	.140	.146	65
153	1— ¼ inch	.147	.153	68
168	1—No. 2 gauge	.162	.168	74
180	2—No. 6 gauge	.174	.180	78
208	2—No. 5 gauge	.202	.208	89
245	2—No. 4 gauge	.239	.245	103
267	3—No. 6 gauge	.261	.267	111
287	3—No. 5½ gauge	.281	.287	119
309	3—No. 5 gauge	.303	.309	128
336	3—No. 4½ gauge	.330	.336	138
365	3—No. 4 gauge	.359	.365	149
395	3—No. 3½ gauge	.389	.395	160

TABLE NO. 2

Longitudinals spaced 4 ins. Cross wires 14-gauge spaced 8 ins.

036P	1—No. 12 gauge	.026	.036	17
044P	1—No. 11 gauge	.034	.044	20
053P	1—No. 10 gauge	.043	.053	24
062P	1—No. 9 gauge	.052	.062	27
072P	1—No. 8 gauge	.062	.072	31
084P	1—No. 7 gauge	.074	.084	35
097P	1—No. 6 gauge	.087	.097	40

Length of rolls: 150, 200 and 300 ft.

Widths: Approximately 16, 20, 24, 28, 32, 36, 40, 44, 48, 52 and 56 in.

Ultimate tensile strength 70,000 to 85,000 lbs. per sq. in.

Note: Materials may be furnished either plain or galvanized. Unless otherwise specified, shipments will be made of material not galvanized.

TABLE NO. 3

Longitudinals spaced 4 ins. Cross wires 12½-gauge spaced 8 ins. Number and gauge of wires, areas per foot width and weights per 100 sq. ft.

Style No.	Number and gauge of wires each longitudinal American Steel & Wire Company's steel wire gauge	Effective sectional area of cross reinforcement, sq. in. per ft. width	Effective longitudinal sectional area, sq. in. per ft. width	Approximate weight, lbs. per 100 sq. ft.
041R	1—No. 12 gauge	.014	.041	21
049R	1—No. 11 gauge	.014	.049	24
058R	1—No. 10 gauge	.014	.058	28
067R	1—No. 9 gauge	.014	.067	31
077R	1—No. 8 gauge	.014	.077	35
089R	1—No. 7 gauge	.014	.089	40
102R	1—No. 6 gauge	.014	.102	44

TABLE NO. 4

This material is used principally for cement-gun work. Longitudinals spaced 4 ins. Cross wires spaced 2 ins.

Style No.	Number of wires each long	Gauge of wire each long	Gauge of cross wires	Approximate weight, lbs. per 100 sq. ft.
7-A	1	12	14	31
6-A	1	10	14	37
5-A	1	8	14	44
4-A	1	6	14	53
29-A	1	12	12½	42
28-A	1	10	12½	48
27-A	1	8	12½	55
26-A	1	6	12½	64

See footnotes under table No. 2.

TABLE NO. 5

Areas in sq. ft. per roll of triangle mesh reinforcement

Width of roll in.	Sq. ft. of reinforcement in roll		
	150-ft. roll	200-ft. roll	300-ft. roll
16	200	267	400
20	250	333	500
24	300	400	600
28	350	467	700
32	400	533	800
36	450	600	900
40	500	667	1000
44	550	733	1100
48	600	800	1200
52	650	867	1300
56	700	933	1400

For the Lighter Styles we recommend the use of 200 or 300-ft. rolls. The Heavy Styles are easier to handle in 150-ft. rolls.

DESCRIPTION OF WELDED WIRE FABRIC REINFORCEMENT

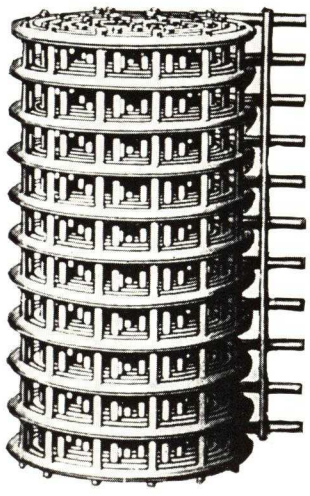
AMERICAN STEEL & WIRE COMPANY USS Welded Wire Fabric is a square or rectangular fabric made from cold drawn steel wire electrically welded at the intersections of the transverse and longitudinal wires. Various combinations of spacings of wires can be furnished but the standard spacings for the longitudinals are 2, 3, 4 or 6 in. and for the transverse wires 6, 8, 12 or 16 in. See tables for Styles of Welded Wire Fabric usually carried in stock.

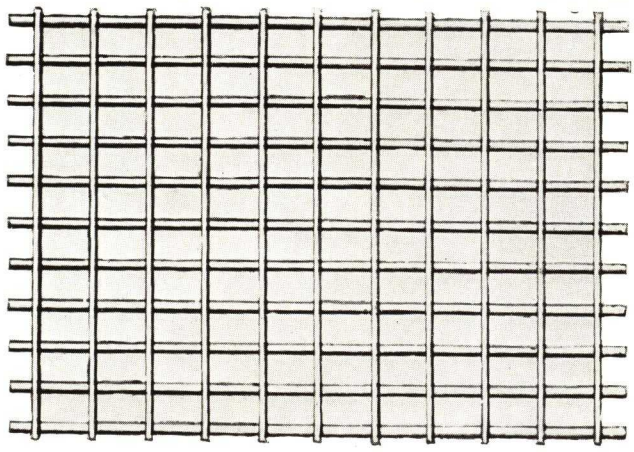
The cross or transverse wires extend out 1 in. beyond the outside or selvage longitudinal wires.

The weights given in tables No. 6, 7 and 8 are based on a width of fabric measured center to center of the outside longitudinals. Square footage is based on a width exclusive of the overhang of the cross wires outside of the longitudinals.

It is regularly made in rolls but can be furnished in flat sheets when required.

All widths are based on the distance center to center of the outside or selvage longitudinal wires. The maximum width of fabric depends on the spacing and size of the longitudinal wires and range from 54 to 126 in.





STANDARD STYLES USS ELECTRICALLY WELDED WIRE FABRIC REINFORCEMENT†

TABLE NO. 6

Showing Styles, Sizes and Spacing of Wires, Sectional Areas and Weights of the More Common Styles of Fabric Specified.

Style No.	Spacing of wires, in.		Gauge No.		Sect. areas, sq. in. per ft.		Weight, lbs. per 100 sq. ft.
	Longit.	Trans.	Longit.	Trans.	Longit.	Trans.	
22–1616*	2	2	16	16	.018	.018	13
22–1414*	2	2	14	14	.030	.030	21
22–1313*	2	2	13	13	.039	.039	28
22–1212*	2	2	12	12	.052	.052	37
22–1111*	2	2	11	11	.068	.068	48
22–1010	2	2	10	10	.086	.086	60
24–1414*	2	4	14	14	.030	.015	16
24–1314*	2	4	13	14	.039	.015	19
24–1212*	2	4	12	12	.052	.026	28
212–38	2	12	3	8	.280	.021	105
212–06	2	12	0	6	.443	.029	166
216–812	2	16	8	12	.124	.007	46
216–711	2	16	7	11	.148	.008	55
216–610	2	16	6	10	.174	.011	65
216–510	2	16	5	10	.202	.011	75
216–49	2	16	4	9	.239	.013	89
216–38	2	16	3	8	.280	.015	104
216–28	2	16	2	8	.325	.015	119
216–17	2	16	1	7	.377	.018	139
33–1212*	3	3	12	12	.035	.035	25
33–1111*	3	3	11	11	.046	.046	32
33–1010	3	3	10	10	.057	.057	41
33–99	3	3	9	9	.069	.069	49
33–88	3	3	8	8	.082	.082	58
316–812	3	16	8	12	.082	.007	32
316–711	3	16	7	11	.098	.009	38
316–610	3	16	6	10	.116	.011	45
316–510	3	16	5	10	.135	.011	52
316–49	3	16	4	9	.159	.013	61
316–38	3	16	3	8	.187	.015	72
316–28	3	16	2	8	.216	.015	83
316–17	3	16	1	7	.252	.018	96
316–06	3	16	0	6	.295	.022	113
44–1414*	4	4	14	14	.015	.015	11
44–1313*	4	4	13	13	.020	.020	14
44–1212*	4	4	12	12	.026	.026	19
44–1010	4	4	10	10	.043	.043	31
44–88	4	4	8	8	.062	.062	44
44–77	4	4	7	7	.074	.074	53
44–66	4	4	6	6	.087	.087	62
44–44	4	4	4	4	.120	.120	85
48–1313*	4	8	13	13	.020	.010	11
48–1212*	4	8	12	12	.026	.013	14
48–1112*	4	8	11	12	.034	.013	17
48–1012	4	8	10	12	.043	.013	20
48–912	4	8	9	12	.052	.013	23
48–812	4	8	8	12	.062	.013	27
48–711	4	8	7	11	.074	.017	33
412–1212*	4	12	12	12	.026	.009	13
412–1112*	4	12	11	12	.034	.009	16
412–1012	4	12	10	12	.043	.009	19
412–912	4	12	9	12	.052	.009	22
412–812	4	12	8	12	.062	.009	26
412–711	4	12	7	11	.074	.011	31
412–610	4	12	6	10	.087	.014	37
412–67	4	12	6	7	.087	.025	40
412–510	4	12	5	10	.101	.014	42
412–57	4	12	5	7	.101	.025	45
412–49	4	12	4	9	.120	.017	49
416–711	4	16	7	11	.074	.009	30
416–610	4	16	6	10	.087	.011	35
416–510	4	16	5	10	.101	.011	40
416–49	4	16	4	9	.120	.013	48
416–38	4	16	3	8	.140	.015	56
416–28	4	16	2	8	.162	.015	64
66–1212*	6	6	12	12	.017	.017	13
66–1010	6	6	10	10	.029	.029	21
66–99	6	6	9	9	.035	.035	25
66–88	6	6	8	8	.041	.041	30
66–77	6	6	7	7	.049	.049	36
66–66	6	6	6	6	.058	.058	42
66–55	6	6	5	5	.067	.067	49
66–46	6	6	4	6	.080	.058	50
66–44	6	6	4	4	.080	.080	58
66–33	6	6	3	3	.093	.093	68
66–22	6	6	2	2	.108	.108	78
66–11	6	6	1	1	.126	.126	91
66–00	6	6	0	0	.148	.148	107

†Other styles can be furnished on application.

*Furnished galvanized only.

Rolls: Standard lengths 150, 200 and 300 ft.

Widths: Multiples of the spacing of longitudinal wires up to a maximum width which varies with the size and spacing of the longitudinals. Approximate maximums 56 to 100 in. for 2-in. spacing, 54 to 100 in. for 3 or 4-in. spacing, and 72 to 126 in. for 6-in. spacing.

Finish: Plain or galvanized.

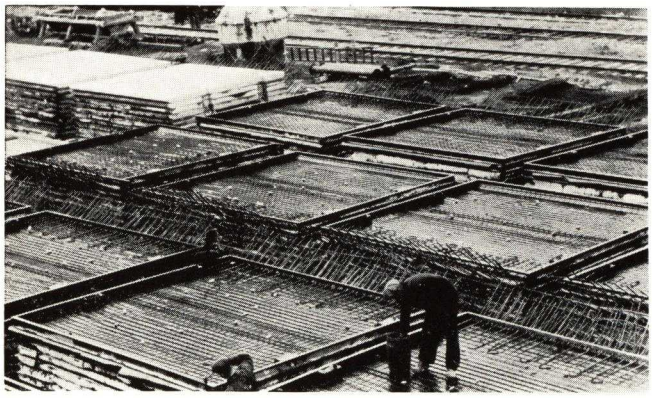
Tensile strength: 70,000 to 80,000 lbs. per sq. in.

Weights: All estimated weights are based on a width of 60 in. measured from center to center of the outside or selvage longitudinal wires.

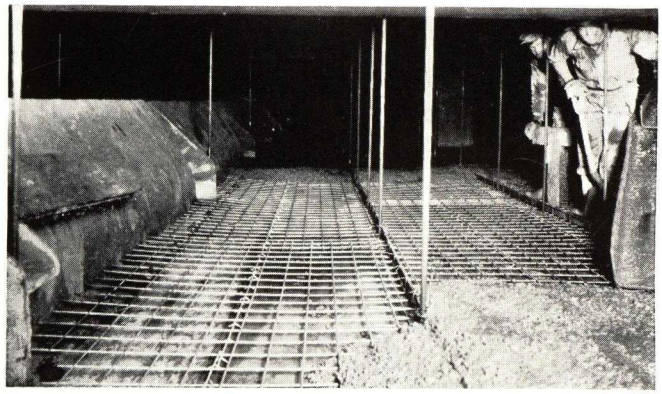
HOW TO ORDER USS WELDED WIRE FABRIC

Specify the spacings of wires first, then the size or gauge. In each case mention first the longitudinals which are the wires running lengthwise of the roll or sheet.

The lengths and widths of rolls or sheets should be shown. If rolls are ordered and there is no preference as to widths or lengths, specify the total number of square feet and state any standard length and width of rolls will be satisfactory.



Welded Wire Fabric Precast Slabs, Chicago Sanitary District Sewage Disposal Plant, Stickney, Ill.



Welded Wire Fabric Reinforcing Smoke Chamber Slabs, Chicago Post Office, Chicago, Ill.

TABLES FOR ESTIMATING WEIGHT OF USS ELECTRICALLY WELDED WIRE FABRIC

TABLE NO. 7

Weights per 100 Sq. Ft. Assuming Net Width of 60 Ins. Center to Center of Outside Wires

American Steel & Wire Company's Steel Wire Gauge No.	Spacing of Longitudinals, in inches						Spacing of Cross Wires, in Inches						
	2	3	4	6	8	12	2	3	4	6	8	12	16
0000	256.43	173.71	132.35	90.99	69.80	49.63	256.43	170.95	128.22	85.48	64.11	42.74	32.05
000	217.31	147.21	112.16	77.11	59.14	42.06	217.31	144.87	108.66	72.44	54.33	36.22	27.16
00	181.16	122.72	93.54	64.28	49.31	35.06	181.16	120.78	90.58	60.39	45.29	30.19	22.65
0	155.37	105.25	80.19	55.13	42.29	30.07	155.37	103.58	77.69	51.79	38.84	25.90	19.42
1	132.43	89.71	68.35	46.99	36.05	25.63	132.43	88.29	66.22	44.14	33.11	22.07	16.55
2	113.96	77.20	58.82	40.44	31.02	22.06	113.96	75.97	56.99	37.99	28.49	18.99	14.24
3	98.21	66.53	50.69	34.85	26.73	19.01	98.21	65.47	49.10	32.74	24.55	16.37	12.28
4	83.95	56.87	43.33	29.79	22.85	16.25	83.95	55.97	41.97	27.98	20.99	13.99	10.49
5	70.87	48.01	36.58	25.15	19.29	13.72	70.87	47.24	35.43	23.62	17.72	11.81	8.86
6	60.96	41.29	31.46	21.63	16.59	11.80	60.96	40.64	30.48	20.32	15.24	10.16	7.62
7	51.81	35.10	26.74	18.38	14.10	10.03	51.81	34.54	25.90	17.27	12.95	8.63	6.48
8	43.40	29.40	22.40	15.40	11.81	8.40	43.40	28.93	21.70	14.47	10.85	7.23	5.43
9	36.37	24.64	18.77	12.91	9.90	7.04	36.37	24.25	18.18	12.12	9.09	6.06	4.55
10	30.14	20.42	15.56	10.69	8.20	5.83	30.14	20.09	15.07	10.05	7.53	5.02	3.77
11	24.01	16.27	12.39	8.52	6.54	4.65	24.01	16.01	12.01	8.00	6.00	4.00	3.00
12	18.41	12.47	9.50	6.53	5.01	3.56	18.41	12.27	9.20	6.14	4.60	3.07	2.30
13	13.84	9.38	7.15	4.91	3.77	2.68	13.84	9.23	6.92	4.61	3.46	2.31	1.73
14	10.58	7.17	5.46	3.76	2.88	2.05	10.58	7.06	5.29	3.53	2.65	1.76	1.32
16	6.46	4.38	3.33	2.29	1.77	1.25	6.45	4.31	3.23	2.15	1.62	1.08	0.81

The above weights are based on width of 60 in. measured from center to center of the outside or selvage longitudinal wires.

The weight of the cross or transverse wires includes the 1-in. projection or overhang beyond the outside longitudinal wires.

Note: To determine the weight of any type add the weights of the longitudinal and transverse members, adjust the total to the nearest pound, considering 0.5 lb. or over to be 1 lb., and less than 0.5 lb. to be zero.

TABLE NO. 8

Sectional Areas of USS Electrically Welded Wire Fabric. Area in Square Inches per Foot of Width for Various Spacing of Wires

American Steel & Wire Company's Steel Wire Gauge No.	Wire		Center to Center spacing, in inches											
	Diam. Inches	Area Sq. Ins.	2	3	4	5	6	7	8	9	10	12	14	16
0000	.3938	.12180	.731	.487	.365	....	.244	....	.183	....	....	.122	....	....
000	.3625	.10321	.619	.413	.310	....	.206	....	.155	....	....	.103	....	....
00	.3310	.086049	.516	.344	.258	....	.172	....	.129	....	....	.086	....	....
0	.3065	.073782	.443	.295	.221	.177	.148	.126	.111	.098	.089	.074	.063	.055
1	.2830	.062902	.377	.252	.189	.151	.126	.108	.094	.084	.075	.063	.054	.047
2	.2625	.054119	.325	.216	.162	.130	.108	.093	.081	.072	.065	.054	.046	.041
3	.2437	.046645	.280	.187	.140	.112	.093	.080	.070	.062	.056	.047	.040	.035
4	.2253	.039867	.239	.159	.120	.096	.080	.068	.060	.053	.048	.040	.034	.030
5	.2070	.033654	.202	.135	.101	.081	.067	.058	.050	.045	.040	.034	.029	.025
6	.1920	.028953	.174	.116	.087	.069	.058	.050	.043	.039	.035	.029	.025	.022
7	.1770	.024606	.148	.098	.074	.059	.049	.042	.037	.033	.030	.025	.021	.018
8	.1620	.020612	.124	.082	.062	.049	.041	.035	.031	.027	.025	.021	.018	.015
9	.1483	.017273	.104	.069	.052	.041	.035	.030	.026	.023	.021	.017	.015	.013
10	.1350	.014314	.086	.057	.043	.034	.029	.025	.021	.019	.017	.014	.012	.011
11	.1205	.011404	.068	.046	.034	.027	.023	.020	.017	.015	.014	.011	.010	.009
12	.1055	.0087417	.052	.035	.026	.021	.017	.015	.013	.012	.010	.009	.007	.007
13	.0915	.0065755	.039	.026	.020	.016	.013	.011	.010	.009	.008	.007	.006	.005
14	.0800	.0050266	.030	.020	.015	.012	.010	.009	.008	.007	.006	.005	.004	.004
16	.0625	.0030680	.018	.012	.009	....	.006	.005	....	.004	....	.003	....	.002

SUGGESTIONS FOR USE OF WIRE FABRIC REINFORCEMENT IN BUILDINGS

BASEMENT FLOOR SLABS

For small residences and apartment buildings use Style 032 Triangle Mesh or 6x6-in. mesh No. 10 and No. 10-gauge welded fabric. For slabs laid over filled land use Style 080 Triangle Mesh or a 6x6-in. mesh No. 6 and No. 6-gauge welded fabric.

SIDEWALKS, GARAGE DRIVEWAYS AND ALLEYS

For sidewalks use Style 032 Triangle Mesh or a 6x6-in. mesh all No. 10-gauge welded wire fabric. For driveways and alleys use Style 080 Triangle Mesh or 6x6-in. mesh No. 6 and No. 6-gauge welded wire fabric.

CONCRETE FLOOR FILLING

As a minimum use 6x6-in. mesh all No. 10 gauge or 4x4-in. mesh all No. 14 gauge.

PAN JOIST, TILE JOIST CONSTRUCTION

For minimum requirements, use 4x12-in. mesh No. 10 and No. 12 gauge wires or 6x6-in. mesh all No. 10 gauge wires.

BEAM SLAB CONSTRUCTION

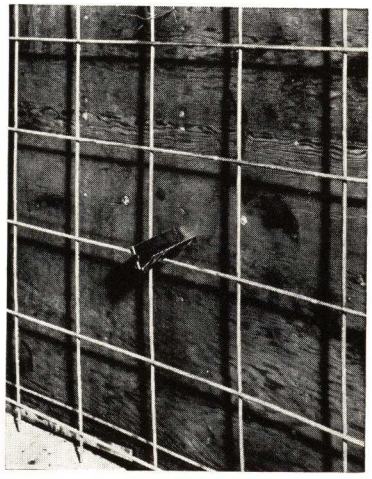
Wire fabric, when used in this type of construction, can be designed in accordance with usual design formulas for reinforced concrete construction. A working stress of 30,000 lbs. per sq. in. (which is at least one-half the yield point of the material) is recommended.

It is the stress recommended for one way slabs by Committee 501 of the American Concrete Institute in their Report on a Standard Building Code adopted as a Tentative Standard in February, 1936.

FIREPROOF COLUMNS, BEAMS ENCASED IN CONCRETE

Use as a minimum 4x4-in. mesh all No. 13 gauge welded fabric or style 032 Triangle Mesh.

CONCRETE WALLS



Details of Wire Fabric in 6-in. Concrete Wall Construction. Used in Chicago Post Office, Chicago, Ill.

The proposed Building Regulations for Reinforced Concrete of the American Concrete Institute, adopted as a tentative Standard February, 1936, Sec. 122 (i) requires:

"Monolithic Walls shall be reinforced with an area of steel in each direction both vertical and horizontal, at least equal to 0.0025 times the cross-sectional area of the wall if of bar and 0.0018 times the area if of Electrically Welded Wire Fabric. The wire of the welded fabric shall be of not less than No. 10 gauge. Walls more than eight inches in thickness shall have the reinforcement for each direction placed in two layers parallel with the faces of the wall . . ."

SLAB REINFORCEMENT

Styles of continuous wire fabric for different floor loadings for spans up to 8 ft. in accordance with the New York City Building Code

TABLE No. 9
Standard Styles USS Wire Fabric Required for Various Loads

Total load per sq. ft. including weight of slab		Clear Span Between Steel Flanges																			
		4′ 0″	4′ 3″	4′ 6″	4′ 9″	5′ 0″	5′ 3″	5′ 6″	5′ 9″	6′ 0″	6′ 3″	6′ 6″	6′ 9″	7′ 0″	7′ 3″	7′ 6″	7′ 9″	8′ 0″			
USS Electric Welded Reinforcement—4-in. Cinder Concrete Slabs, 1:2:5 Mixture																					
100 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	3 x 12			
	Gauge wire	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	8 & 12	
125 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	3 x 12	4 x 16	3 x 16	4 x 16	
	Gauge wire	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	8 & 12	6 & 10	7 & 11	5 & 10			
150 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	4 x 16	
	Gauge wire	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	6 & 10	6 & 10	4 & 9		
175 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	3 x 16	3 x 16	2 x 16	3 x 16	3 x 16		
	Gauge wire	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	5 & 10	5 & 10	5 & 10	7 & 11	4 & 9	6 & 10	3 & 8		
200 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	2 x 16	3 x 16		
	Gauge wire	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	4 & 9	5 & 10	3 & 8	4 & 9	4 & 9	6 & 10	3 & 8			
225 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	3 x 16	2 x 16	3 x 16	2 x 16	3 x 16	2 x 16				
	Gauge wire	9 & 12	8 & 12	8 & 12	7 & 11	6 & 10	6 & 10	7 & 11	5 & 10	6 & 10	5 & 10	5 & 10	7 & 11	4 & 9	6 & 10	3 & 8	3 & 8	5 & 10			
250 lbs.																					
4-in. Stone Concrete Slabs, 1:2:4 Mixture																					
100 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16			
	Gauge wire	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11				
125 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	3 x 12	4 x 16			
	Gauge wire	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10			
150 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16			
	Gauge wire	10 & 12	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10			
175 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	4 x 16				
	Gauge wire	10 & 12	10 & 12	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	6 & 10	4 & 9			
200 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	3 x 16	4 x 16				
	Gauge wire	10 & 12	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	6 & 10	5 & 10	5 & 10	3 & 8			
225 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 12	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16				
	Gauge wire	10 & 12	9 & 12	9 & 12	8 & 12	8 & 12	7 & 11	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	4 & 9	5 & 10	3 & 8	4 & 9	4 & 9			
250 lbs.	Wire spacing, in.	4 x 12	4 x 12	4 x 12	4 x 16	3 x 12	4 x 16	3 x 16	4 x 16	3 x 16	4 x 16	3 x 16	3 x 16	3 x 16	3 x 16	2 x 16	2 x 16				
	Gauge wire	10 & 12	9 & 12	8 & 12	8 & 12	7 & 11	8 & 12	6 & 10	7 & 11	5 & 10	6 & 10	6 & 10	5 & 10	5 & 10	7 & 11	4 & 9	6 & 10	6 & 10			

BETHLEHEM STEEL COMPANY

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BETHLEHEM, PA.

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EXPORT DISTRIBUTOR: Bethlehem Steel Export Corporation, 25 Broadway, NEW YORK, N. Y.

For Other Bethlehem Pages, see File Index

CONCRETE REINFORCEMENT PRODUCTS

BETHLEHEM BARS for concrete reinforcement; WIRE FABRIC; COLUMN SPIRALS; REMOVABLE STEEL TILE; STEEL COLUMN FORMS; METAL LATH; Complete Line of ACCESSORY PRODUCTS—Bar Supports and Spacers, and Allied Products.

Bethlehem Bars

For concrete reinforcement. Deformed bars rolled to standard specifications of billet steel, as illustrated above, or rail steel to section areas conforming to Simplified Practice Recommendation R-26-30 of the U. S. Department of Commerce.

Bethlehem Bars are branded for ready identification of size.

STANDARD SIZES BETHLEHEM BARS

Size	⅜ in. round	½ in. round	½ in. square equiv.	⅝ in. round	¾ in. round	⅞ in. round	1 in. round	1 in. square equiv.	1⅛ in. square equiv.	1¼ in. square equiv.
Area (sq. in.) ..	.11	.20	.25	.31	.44	.60	.79	1.00	1.27	1.56

Column Forms

Bethlehem Circular Steel Column Forms are highly efficient and economical. They possess points of definite superiority over square column forms. They provide a smooth and perfectly uniform column, free from "knobs," "bulging" and "necking in."

Built of 20-gauge sheet steel, Bethlehem Column Forms are light, convenient to handle, and flexible. Yet they are amply strong to stand up under the most severe conditions.

These forms are built to produce accurate contours and are notable for their strength and simplicity of detail. They are furnished to contractors on a lease-and-erection basis.

Complete information on request.

Column Spirals

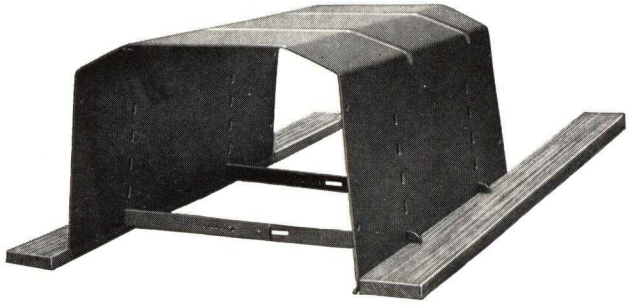
Spiral reinforcement for concrete columns furnished coiled to accurate diameter with spacers attached.

Collapsed for convenient handling.

Removable Steel Tile

For use as fillers or cores between the ribs of reinforced-concrete-joist floor and roof construction, Bethlehem offers steel tile of many advantages.

The tile is made of 16-gauge sheet steel with two ribs drawn in the top to provide stiffness. They are light and easy to handle. Two types are available:



(1) Spreader Tile, which make possible a decided saving in the erection of the wood centering; and (2) Nail-down Tile, which are preferred by some contractors.

Both types are furnished on a lease only or lease-and-erection basis.

Bar Supports and Spacers

Substantial devices for general use in accurate and economical setting of reinforcing steel. These products are standard in quality and performance for their purposes.

Accessory Products

Inserts and anchoring devices, usual in modern concrete construction, and an extensive line of products for use in erecting metal lath and related detail.

Engineering Service

Through all its offices, BETHLEHEM STEEL COMPANY offers expert assistance on matters of design and estimating of reinforced concrete structures, together with detailed advice concerning all Bethlehem products.

Folders and descriptive sheets are available on individual products, and will be supplied promptly on request.

CONCRETE STEEL COMPANY

2 Park Avenue, NEW YORK, N. Y.

SALES OFFICES

BIRMINGHAM, ALA. | CHICAGO, ILL. | PHILADELPHIA, PA. | SYRACUSE, N. Y.
BOSTON, MASS. | DETROIT, MICH. | ST. PAUL, MINN. | WASHINGTON, D. C.

WAREHOUSES AND FABRICATING WORKS

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Products

CONCRETE REINFORCEMENT BARS; COLLAPSIBLE SPIRALS for column reinforcement; REMOVABLE METAL FORMS; CONCRETE INSERTS; CURB BARS; CONCRETE REINFORCEMENT ACCESSORIES, including SUPPORTING, SPACING and TYING DEVICES for holding bars in place in forms; WIRE DEVICES; WIRE SOFFIT CLIPS; WALL ANCHORS and TIES; EXPANDED METAL LATH (Plain and Self-furring); EXPANDED METAL REINFORCEMENT; HOT ROLLED and COLD FORMED CHANNELS; CORNER BEADS; RIB LATH; WIRE MESH; BAR MAT ROAD REINFORCEMENT; SANITREAD; "CONSTEEL" JOISTS.

Concrete Reinforcement Bars

The Havemeyer deformed bar (Figs. 1 and 2) is rolled in square and round sections, with the deformations running longitudinally and entering directly into the tensile strength of the bar, no metal being used for the mechanical bond only. At all points it has a constant uniform area of cross section exactly

Fig. 1. Round

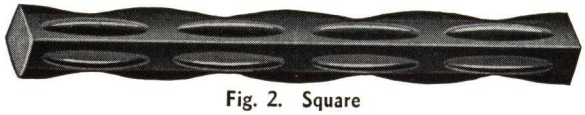


Fig. 2. Square

equal to the cross-sectional area of a plain bar of same size. As the projections and depressions are rolled longitudinally, there are no sharp angles to start a fracture when bar is bent.

Havemeyer bars are rolled to any desired standard specification from new billet steel. Complete stocks of Havemeyer bars, rolled to A.S.T.M. standard specifications A-15-35, are carried in all our warehouses.

We are also prepared to furnish rail steel deformed bars complying with A.S.T.M. specifications, Serial A-16-35, and maintain stocks of rail steel in some of our warehouses.

Shop Bending and Fabricating—Our warehouses are equipped for bending and fabricating bars. This service not only insures greater accuracy but is more economical for the contractor than if he did the work himself.

Collapsible Spirals

Accurately coiled, rigidly spaced and shipped collapsed, ready to be opened up and placed in the forms.

Removable Metal Forms

Removable metal forms, in a wide range of dimensions, adapted to all types of buildings designed for concrete joists, are available to contractors on a rental basis.

Concrete Inserts

Dayton Adjustable-Inserts, with keyhole slot for adjustment; "Y" Socket-Inserts; Slotted-Inserts, unlimited adjustment obtainable.

Accessories for Supporting, Spacing and Tying Bars

Consist of Bar-Tys, Hy-Chairs, Ty-Chairs, Easel-Chairs, Sheet Metal and Welded Wire Bar-Spacers, Beam-Saddles and Separators.

These devices offer many decided advantages. Supporting devices keep bars at proper distance above the forms.

Wire Devices

Soffit clips; hanger wire, straight, cut and bent, toggle hangers, etc.

Our wire shops are prepared to manufacture, on short notice, any type of wire device required for the installation of suspended ceilings or for securing lath. Tie wire, staples, etc., carried in stock.

Fireproofing Products

Metal Lath—Flat expanded, flat rib, ⅜-in. rib, ¾-in. rib and perforated sheet.

Furring—Hot rolled channels, angles and flats.

Cold rolled channels, ¾, 1, 1½ and 2 ins.

Corner Beads—Expanded wing, scalloped edge, rail and bullnose types.

Lengths, 6, 7, 8, 9, 10 and 12 ft.

Base Beads—Expansion, plain and curved point.

Wire Mesh—Both triangle and electric weld, plain and galvanized, all standard weights and areas.

Expanded Metal—Complete information furnished on request.

Road Reinforcement, Curb Bars, Etc.

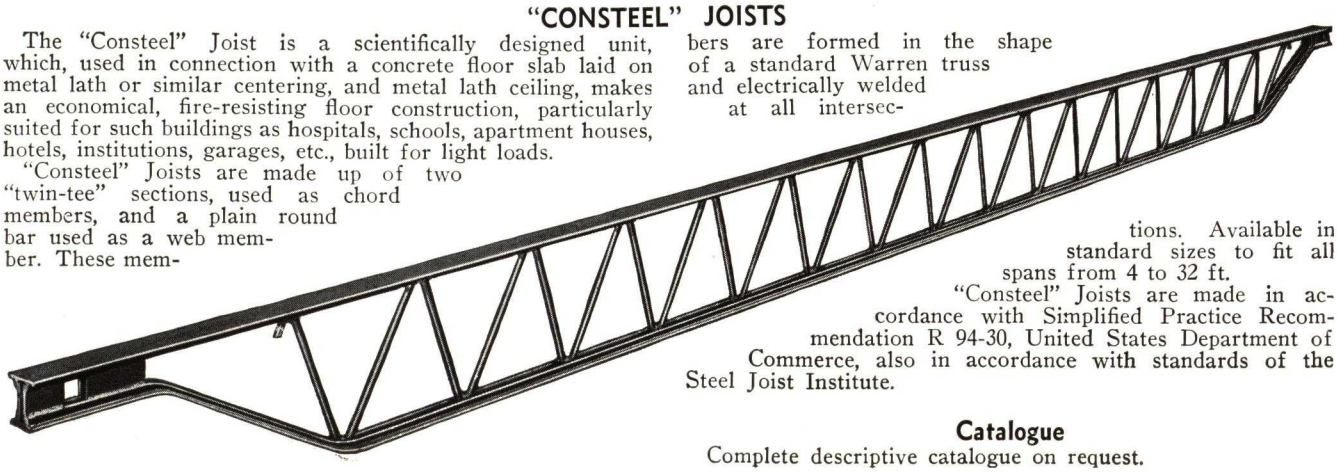
We furnish wire mesh, welded or clipped bar mat road reinforcing, together with all accessories for placing mats, joint construction, etc.; also cork, asphalt and other types of road joint.

Also round nose and angle nose curb bars for curb edge protection, stair nosings and platform edges; and Sanitread for safe, non-slip step surfaces.

"CONSTEEL" JOISTS

The "Consteel" Joist is a scientifically designed unit, which, used in connection with a concrete floor slab laid on metal lath or similar centering, and metal lath ceiling, makes an economical, fire-resisting floor construction, particularly suited for such buildings as hospitals, schools, apartment houses, hotels, institutions, garages, etc., built for light loads.

"Consteel" Joists are made up of two "twin-tee" sections, used as chord members, and a plain round bar used as a web member. These members are formed in the shape of a standard Warren truss and electrically welded at all intersections. Available in standard sizes to fit all spans from 4 to 32 ft.



"Consteel" Joists are made in accordance with Simplified Practice Recommendation R 94-30, United States Department of Commerce, also in accordance with standards of the Steel Joist Institute.

Catalogue

Complete descriptive catalogue on request.

MEMORANDA

THE CONSOLIDATED EXPANDED METAL COMPANIES

Steelcrete Concrete Reinforcing Mesh and Steelcrete Welded Wire Fabric

WHEELING, W. VA.

SALES OFFICES AND WAREHOUSES

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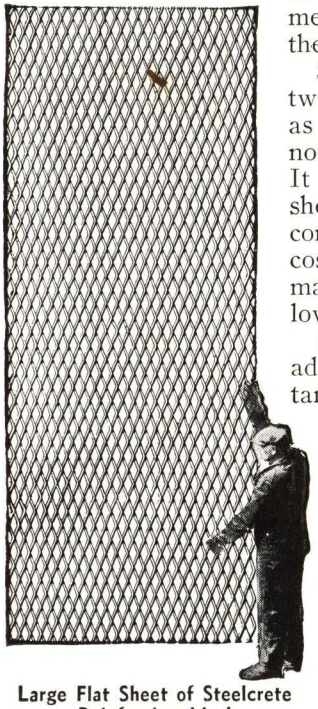
BOSTON, MASS. CHICAGO, ILL. DETROIT, MICH. NEW YORK, N. Y. PITTSBURGH, PA.

For Other Steelcrete Pages, see File Index

STEELCRETE REINFORCING MESH

Steelcrete Reinforcing Mesh is a diamond mesh fabric, cold drawn from a solid steel plate and has an elastic limit 60% higher than commercial medium steel. In the process of manufacture every strand is tested against flaws and other weaknesses, assuring a uniform mesh of high elastic limit.

Steelcrete Mesh is free from mechanical and welded joints, the fabric being one solid sheet.



Large Flat Sheet of Steelcrete Reinforcing Mesh

Steelcrete Mesh provides two-way reinforcement, as well as the diagonal reinforcement, not ordinarily taken care of. It is furnished in large, flat sheets, suitable to all types of construction, easy to handle and costs less "in place" than many materials having considerably lower reinforcing values.

Steelcrete Mesh is especially adapted for use in tunnels, tanks, sewers, culverts, retaining walls, foundations and floor slats.

Reduces Shrinkage Cracks

One of the principal uses of steel reinforcement is to prevent or minimize shrinkage cracks. Such reinforcing resists stresses that otherwise would be borne by the concrete alone—stresses that fracture plain concrete. Steelcrete—a diamond mesh—extending in each diagonal direction—distributes stresses throughout the slab thus reducing tendency of the concrete to fracture, and effectually serving the purpose.

STANDARDS FOR "STEELCRETE" EXPANDED METAL

Designation of mesh	Effective sectional area sq. in. per ft. width	Approx. weight per sq. ft., lb.	Standard width of sheets,	Standard length of sheets, ft.
3-13-075	.075	.25	6′-4″	8, 10, 12, 16
3-13- 10	.10	.34	7′-0″	8, 10, 12, 16
3-13-125	.125	.42	5′-8″	8, 10, 12, 16
3- 9- 15	.15	.51	7′-0″	8, 10, 12, 16
3- 9-175	.175	.60	6′-0″	8, 10, 12, 16
3- 9- 20	.20	.68	5′-3″	8, 10, 12, 16
3- 9- 25	.25	.85	4′-2½″	8, 10, 12, 16
3- 9- 30	.30	1.02	7′-0″	8, 10, 12, 16
3- 9- 35	.35	1.19	6′-0″	8, 10, 12, 16
3- 4- 40	.40	1.36	4′-7″	8, 12
3- 4- 45	.45	1.53	4′-1″	8, 12
3- 4- 50	.50	1.70	7′-4″	8, 12
3- 4- 55	.55	1.87	6′-8″	8, 12
3- 4- 60	.60	2.04	6′-1½″	8, 12

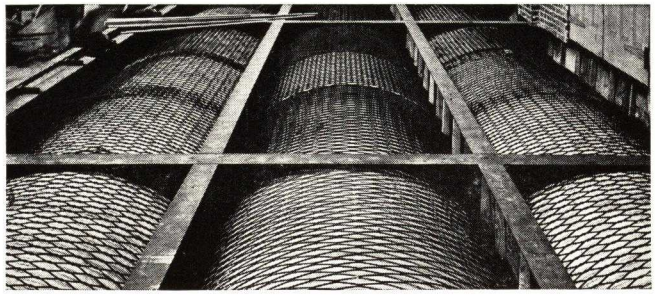
Note: Sheets of special size furnished from the factory only. All the above sizes are furnished in a standard diamond 8 in. long and approximately 3 in. wide.

Provides Better Bond

The very nature of the strands, rectangular in shape, coupled with the solid, rectangular joint or bridge, lends assurance to the engineer or architect that the bond is efficient. The diamond shaped mesh carrying the stresses in diagonal directions, makes Steelcrete ideal to resist "fatigue" of reinforced concrete. *Steelcrete cannot slip in the slab.*

Specifications

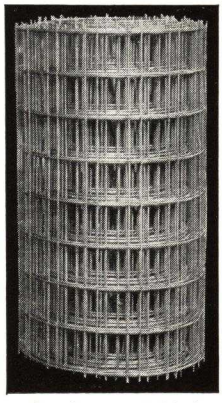
The Steelcrete Mesh shall be laid on the forms with long way of the diamond meshes extending in the direction indicated on the drawings. The separate sheets shall be lapped one mesh on the side and one mesh on the end, and wired together at a sufficient number of points to hold sheets in position while depositing the concrete.



Floor Slab Using Heavy Reinforcing Mesh. Sheets Curved to Suit Beams, Sewers and Conduits at Mill

STEELCRETE WELDED WIRE FABRIC

This is an electrically welded wire fabric furnished in rolls or flat sheets in various gauges and spacing of wires. The wire is manufactured to American Society of Testing Material Specifications. One of the chief advantages of Steelcrete Welded Wire Fabric is that practically any desired size of mesh and wire can be obtained and this affords the designer a great latitude in the selection of a suitable reenforcement.



Steelcrete Welded Wire Fabric

STEELCRETE SERVICE

Immediate shipments can be made from our plant at Beech Bottom, W. Va., or branch warehouses listed above.

JOHNS-MANVILLE

EXECUTIVE OFFICES

22 East 40th Street, NEW YORK, N. Y.

Products

J-M Steeltex Floor Lath and Welded Wire Reinforcement for concrete building construction. *(Other Steeltex products will be found in our catalog in the Metal Lath section of this edition.)*

For the following Johns-Manville products, see File Index; Acoustical Treatment; Asbestos and Asphalt Shingles; Built-up and Insulated Roofs; Home Insulation; Insulating Board; Pipe Coverings and Insulations; Asphalt Tile Flooring; Transite, Flat and Corrugated; Asbestos Wainscoting and Flexboard; Transite Walls; Flush Doors.

J-M STEELTEX FLOOR LATH

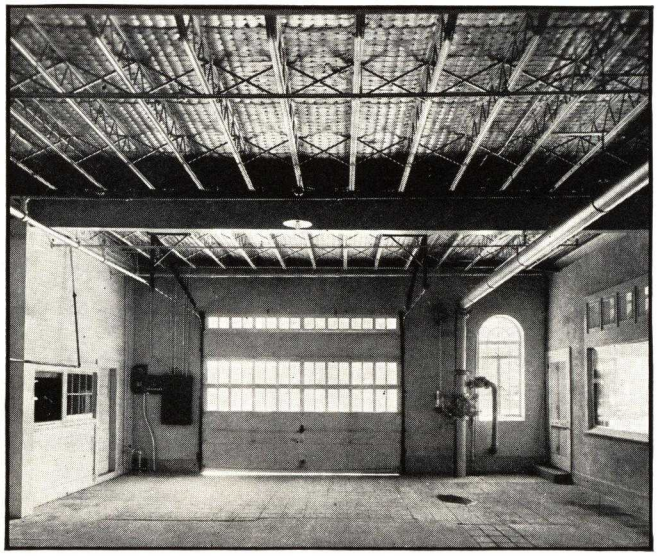
J-M Steeltex Floor Lath is a combined form and reinforcing which offers important structural advantages and economies in light-slab concrete floor and roof construction. It will give maximum reinforcing value and facilitate proper curing of the concrete through the maintenance of the original water-cement ratio, at the same time effecting important savings in application costs and in the reduction of waste material.

The reinforcing element of Steeltex Floor Lath is composed of 12-gauge cold-drawn electrically-welded galvanized steel wire reinforcing mesh. This mesh is attached to a tough corded backing—the form element—by means of crimp wires which also space the reinforcing mesh at the proper distance from the backing to permit the concrete completely to surround and embed the reinforcement. The weight of the poured concrete insures complete and uniform embedment without the labor of blocking up or of pouring the slab in two operations.

The Steeltex corded backing is of ample strength not only to support the concrete while it is being poured, but also to afford a safe walking surface, once the fabric has been attached to the joists. Being water-resistant, the backing minimizes loss of water and fine aggregate through leakage, with a further advantage in the protection it affords to the floors below. Droppings are minimized, clean-up expense is eliminated, and work can proceed in safety even while the concrete is being placed on the floor above.

Form and Reinforcing Combined

Steeltex Floor Lath has the dual feature of making forms unnecessary and providing proper reinforcing for light cement floor or roof slabs



Underside view of a Steeltex Floor Lath installation after the concrete has been poured

Note absence of concrete drippings and of sag between joists—two advantages that mean a worthwhile saving in concrete

Advantages of Steeltex Method of Application

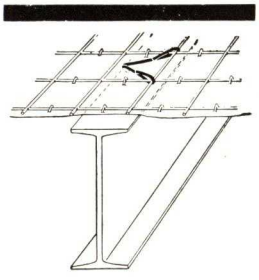
The laying of Steeltex Floor Lath is accomplished with a minimum of time and labor. Furnished in conveniently handled rolls 4 ft. wide by 125 ft. in length, the material is simply unrolled over the joists and cut to length. It is then attached to an end or anchored joist, drawn taut by means of the special Steeltex stretcher furnished for this purpose and fastened by clips to the intermediate joists.

The speed of work is also facilitated by the ability to cut necessary openings for pipes, etc., with snips or knife instead of saw, chisel and auger. Naturally, rolls can be more quickly laid per unit of area than can sheets, and with less waste, since overlapping is minimized.

Properly installed, there is no excessive sag when concrete is being poured, which effects considerable saving. Also, because Steeltex Floor Lath extends in one piece across the entire panel or bay, it gives lateral stiffness, continuity of reinforcing and distribution of loads over a number of joists or beams. The automatic embedding of the steel wire fabric in

the concrete, coupled with its scientific design and spacing, provides maximum reinforcing value and promotes development of the full strength of the slab.

Equally Adaptable to Floors and Roofs



Steeltex Clips furnish a secure hold

The advantages of Steeltex Floor Lath as a reinforcement and form for light-slab floor construction apply equally in the construction of concrete and gypsum roofs. The material is easily laid on sloping or curved roof surfaces and the fibrous backing is particularly adapted to roof construction since it helps check condensation on the underside of the slab, thus protecting the steel joists and beams and the plaster ceiling beneath.

Steeltex Floor Lath Is Applied by Unrolling the Material Across Joists
The roll form assures continuity of reinforcement across the entire panel, and provides, in one operation, both form and reinforcement

Floor slab being poured over Steeltex Floor Lath

TABLE OF SAFE LOADS FOR CONCRETE FLOOR SLABS USING STEELTEX FLOOR LATH

Values in table are Total Safe Load in pounds per sq. ft. uniformly distributed, including Slab

Span of slab, inches	Size of Slab and Weight per square foot			
	2 in. (*25 lbs.*)	2½ in. (*31 lbs.*)	3 in. (*38 lbs.*)	3½ in. (*44 lbs.*)
18	436	586	736	886
20	353	475	597	718
22	292	392	494	594
24	245	330	415	499
26	209	281	353	426
28	180	242	305	366
30	157	211	266	319
32	139	186	234	281
34	123	165	207	248
36	109	146	184	222

Note: For partial continuity, i. e. $M = \frac{W1^2}{10}$ take 5/6 of loads in table.

For simply supported, i. e. $M = \frac{W1^2}{8}$ take 2/3 of loads in table.

For stress in steel other than 20,000, loads are directly proportional to stress, thus for 16,000, take 16/20 of load in table, for 18,000 take 18/20 of load in table, etc.

Specifications for J-M Steeltex Floor Lath

(Specifications for reinforcing concrete and gypsum floors and roofs over steel joists)

Before installing Steeltex Floor Lath, joists shall be rigidly bridged and end joints securely anchored in accordance with Steel Joist Institute specifications.

Steeltex Floor Lath (a 3x4-in., 12-gauge, cold-drawn, electrically-welded, galvanized wire fabric, attached to a water-resistant backing, furnished in rolls 4 ft. x 125 ft.) shall be unrolled across the joists to the desired length from the outer or bearing walls of the building. Steeltex Floor Lath shall be fastened every 12 in. along the end joist with special clips.

Steeltex Floor Lath shall be stretched taut longitudinally across the joists by a special stretcher, and clipped securely every 12 in. along the bearing to which the stretcher is attached. Steeltex Floor Lath shall then be clipped to each joist every 24 in. on joists spaced 16 in. and over, and one clip per width of roll for joists spaced under 16 in. Each clip shall face in the opposite direction from the clip adjacent to it.

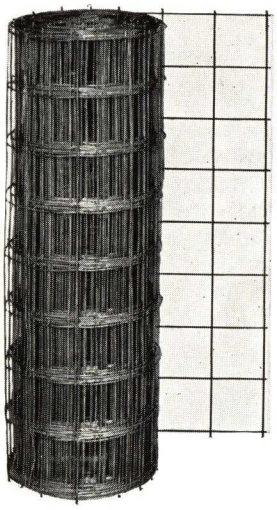
Where end laps are necessary, Steeltex Floor Lath shall be lapped at least 1 ft. directly over a joist. Side laps shall be not less than 2 in.

Note: Installation instructions and test information are available upon request at the nearest Johns-Manville office.

JOHNS-MANVILLE WELDED WIRE REINFORCEMENT

For general concrete building construction, Johns-Manville supplies J-M Welded Wire Reinforcement. This is more than ordinary "steel reinforcement." It is an electrically-welded wire fabric of square or rectangular mesh, manufactured from a special high grade cold-drawn steel wire of high tensile strength and proper ductile qualities.

This welding produces an absolutely rigid connection at every joint. Distortion of the fabric is thereby prevented and, since there are no wraps, ties or clips where the members are joined, the concrete is allowed to flow freely around and completely cover every wire. The result is a perfect bond between concrete and reinforcement. Rolls are of such length as to provide an unbroken continuity of reinforcement extending across the entire width of most buildings. Full effectiveness of reinforcement is thus obtained at every section of the slab, while the almost complete absence of laps and splices reduces the required quantity of steel to the minimum.

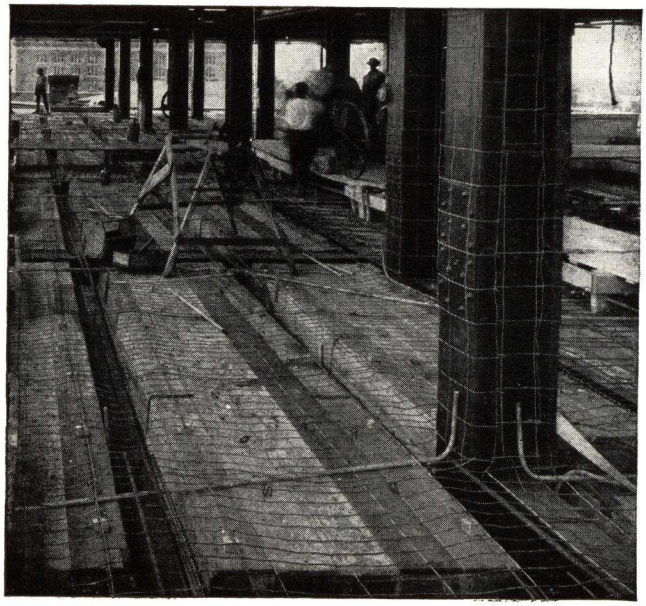


A roll of J-M Welded Wire Reinforcement

A Type for Every Reinforcing Need

Practically any desired size of mesh and gauge of wire may be obtained. *(See table of standard styles opposite.)* This wide range of selection adapts the material to a multitude of uses, including reinforcement of all types of concrete floor slab construction, concrete driveways, sidewalks, retaining walls, etc.; beam and column wrapping; fireproofing of steel framework; temperature reinforcement in top or finish layer of cement or composition floors, etc.

Finish—Plain or Galvanized as specified. *(Plain* fabric will be shipped on all unspecified orders.)



Floor and Column Reinforcing

Tensile Strength—Wire used in all types of J-M Welded Wire Reinforcement will develop 70,000 lbs. per sq. in.

Widths—*Rolls* or *Sheets:* For 4-in. spacing of longitudinal wires, maximum width is 112 in. and is measured from center-to-center of outside longitudinal wires. For 3-in. and 6-in. spacing of longitudinal wires, maximum width is 60 in., with 139 in. possible in some styles, and is measured from center-to-center of outside longitudinal wires. All tranverse wires will have close overhang (½ in. or less) unless otherwise specified.

Lengths—*Rolls:* Stock lengths 100 ft. to 300 ft. depending on style. Customer may specify length of rolls on orders not shipped from stock.

Sheets: No extra charge for sheets 6 ft. or over. Sheet length as specified by customer.

DIMENSIONS, AREAS AND WEIGHTS

SUITABLE USES	Style	Spacing, inches		Gauge of wire		Sec. Area, sq. in. per lin. ft.		Weight per 100 sq. ft. lbs.
		Long.	Tran.	Long.	Tran.	Long.	Tran.	
Gunite, Composition Flooring, Fireproofing, Etc.	AA 1414	2	2	14	14	.030	.030	21
	AA 1212	2	2	12	12	.052	.052	37
	TT 1414	3	3	14	14	.020	.020	14
	TT 1212	3	3	12	12	.035	.035	25
	TT 1010	3	3	10	10	.057	.057	41
	BB 1414	4	4	14	14	.015	.015	11
	BB 1313	4	4	13	13	.020	.020	14
	BB 1212	4	4	12	12	.026	.026	19
	BB 1010	4	4	10	10	.043	.043	31
Gunite, Waterproof Concrete Linings, Etc.	BB 88	4	4	8	8	.062	.062	44
	BB 66	4	4	6	6	.087	.087	62
	BB 44	4	4	4	4	.120	.120	85
Temperature Reinforcing, Ground Floors, Etc.	CC 1212	6	6	12	12	.017	.017	13
	CC 1010	6	6	10	10	.029	.029	21
	CC 99	6	6	9	9	.035	.035	25
	CC 88	6	6	8	8	.041	.041	30
	CC 77	6	6	7	7	.049	.049	36
	CC 66	6	6	6	6	.058	.058	42
Slab Reinforcing, Etc. (One direction only)	AH 711	2	16	7	11	.148	.008	55
	AH 610	2	16	6	10	.174	.011	65
	AH 510	2	16	5	10	.202	.011	75
	AH 49	2	16	4	9	.239	.013	89
	AH 38	2	16	3	8	.280	.015	104
	TH 711	3	16	7	11	.098	.009	38
	TH 610	3	16	6	10	.116	.011	45
	TH 510	3	16	5	10	.135	.011	52
	TH 49	3	16	4	9	.160	.013	61
	TH 38	3	16	3	8	.187	.015	72
	TH 28	3	16	2	8	.217	.015	83
	TH 17	3	16	1	7	.252	.018	96
	TH 06	3	16	0	6	.295	.022	113
	BH 711	4	16	7	11	.074	.008	30
	BH 610	4	16	6	10	.087	.011	35
	BH 510	4	16	5	10	.101	.011	40
	BH 49	4	16	4	9	.120	.013	48
	BH 38	4	16	3	8	.140	.015	56
	BH 28	4	16	2	8	.162	.015	64
Beam Wrapping, Fireproofing, Etc.	BD 1313	4	8	13	13	.020	.010	11
	BD 1214	4	8	12	14	.026	.008	12
	BD 1212	4	8	12	12	.026	.013	14
	BD 1112	4	8	11	12	.034	.013	17
	BD 1012	4	8	10	12	.043	.013	20
Concrete Shapes, Etc.	BD 912	4	8	9	12	.052	.013	23
	BD 812	4	8	8	12	.062	.013	27
	BD 711	4	8	7	11	.074	.017	33
Slab Reinforcing, Driveways, Ramps, Etc.	BF 1012	4	12	10	12	.043	.009	19
	BF 912	4	12	9	12	.052	.009	22
	BF 812	4	12	8	12	.062	.009	26
	BF 711	4	12	7	11	.074	.011	31
	BF 610	4	12	6	10	.087	.014	37
	BF 510	4	12	5	10	.101	.014	42
	BF 49	4	12	4	9	.120	.017	50

Note: The "Style" letter and numerals refer respectively to the spacing of wires and to the gauge of wires; for instance, "BD" means 4-in. spacing of longitudinal wires and 8-in. spacing of transverse wires, and "1112" means No. 11 gauge longitudinal wires and No. 12 gauge transverse wire.

RICHMOND SCREW ANCHOR CO., INC.

Manufacturers of Form Tying Devices for Concrete

OFFICE AND PLANT
241-255 Bush Street, BROOKLYN, N. Y.
AGENTS IN ALL PRINCIPAL CITIES
ASSOCIATED WITH SUPERIOR CONCRETE ACCESSORIES, INC., 4249 Diversey Avenue, CHICAGO, ILL.

PRODUCTS AND SERVICES FOR STRUCTURAL CONCRETE WORK SINCE 1911

Meet Architectural Concrete, Government, and All Other Specifications

The Richmond Screw Anchor Co., Inc. devotes its entire resources and facilities to the design and development of devices for safe use in concrete construction to replace hand-made and job-made products.

Today we stand ready to supply you with a complete line of form tying devices and concrete accessories.

In conjunction with these items we offer the following services.

Form Tie Service

We supply materials and blueprint details for erecting forms in less time than other types of ties will permit. The materials supplied provide for greater salvage values, give more adequate strength, insure correct wall thicknesses without slip or stretch, keep metal back 1 to 2 in. from wall surfaces to prevent unsightly rust stains.

When Tyscrus are used the tie sockets, embedded in the wall, act as anchors for scaffolding in order to permit rubbing while the walls are still workable and provide for secure pointing.

Accessories and Working Parts Loaned

Richmond working parts such as Tylags, Tycones, Flat Washers and Tywrenches are loaned. There is no charge for these parts other than for freighting and loss—there is no limit to the quantity.

These parts, like the form-ties, are made from the best available materials and are designed for lightness.

to aid in handling and to avoid excessive shipping costs. Tylags are of bolt finished stock; cones of malleable iron.

Marking and Shipping

All form-ties are properly bundled and tagged as to sizes of ties in the bundles, and proper locations of the ties in the work.

Shipments are made via the fastest and most economical routes which can be found from our records. A large stock is always on hand for prompt shipment.

Estimating and Technical Aid in Form Tying

This service, which is entirely free, consists of:

(1) Making of blueprint layouts showing the placement of form ties in the forms.

(2) Layouts clearly indicate maximum safe rate of pouring concrete at various temperatures; taking into account the form ties and lumber used.

(3) Showing the actual spacing of the ties.

(4) Indicating the number of and type ties needed for each section of the job.

(5) Showing unique forming suggestions for unusual conditions.

(6) The number of working parts we propose to send.

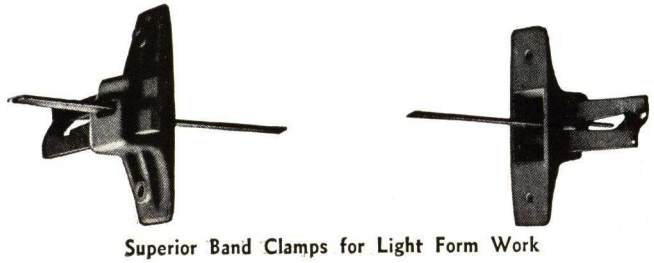
(7) General data, such as calling attention to special conditions existing on the job.

(8) Estimating the cost of form ties and submitting a written bid.

TIES FOR FOUNDATIONS OF ALL TYPES

SUPERIOR BAND CLAMPS

Band Clamps are used on light foundation walls, spandrel beam sides, and general form work when the loads are not heavy, and it is unnecessary to cut the band back of the wall face. They are used with double wales on forms built in place and bear on the studs of adjoining panels on panel forms. Loads should not exceed 1500 pounds per tie. The malleable casting which bears on the wales is cored to guide and support a slotted and crimped steel stamping. The stamping grips the band beyond any possible slipping, but will not cut into it. The band iron used has a yield point of 2000 pounds as against 1775 pounds which is usual for steel bands with a lower carbon content. Bands are supplied in coils of 675 feet, or cut to length.



Superior Band Clamps for Light Form Work

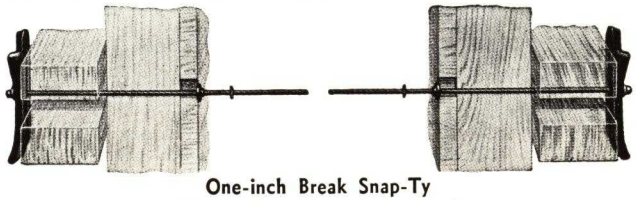
RICHMOND SNAP-TYS

Snap-Tys are used principally for building foundation walls. They act both as tie and spreader. They may be cut off at one end and extracted from wall. They are also furnished to break back any specified distance inside of wall. This is accomplished by a special process coating on the removable part of the rod to insure the break back. Snap-Tys are also made to break flush with the wall surface.

Strength—All types of Snap-Tys have a working load of 3000 pounds; and an ultimate load of 5000 pounds, except the break back Snap-Tys which have an ultimate load of 4800 pounds. This is the maximum strength that can be safely used with 2 x 4-inch studs and 2 x 4-inch waler forms. For heavier forming, stronger ties must be used. Tyscrus recommended.

Tyholders

A malleable wedge type casting which locks the tie to the form. Tyholders are bottom heavy and need no nailing to forms. The wedge shape is ample for take up. They are loaned with a nominal handling charge.

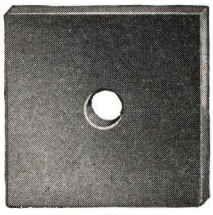


One-inch Break Snap-Ty
(One of several standard types)

RICHMOND TYSCRUS AND TYLOOPS FOR SEMI-HEAVY AND HEAVY CONSTRUCTION

TYSCRUS

Simplicity—The Tyscru acts as a spreader and a tie. It is an extremely simple device. Helix coils, distorted to act as a spring lock, are electrically welded to two longitudinal wires. Special lag screws, under the trade name Tylags are threaded into these coils, and removed for reuse after the concrete has set. Flat washers provide bearing on the wales. This assembly is capable of many combinations and uses in the field. With the ends against the forms or with Tycones, it acts as a spreader. The tie is easily kept back from the wall face, with or without cones. Tie sockets embedded in the wall act as anchors for scaffolding, an extremely important item on many structures.



Flat Washer

Tycone

Strength—Tyscrus are made in any required lengths, and in three sizes, to take ½, ¾ and 1-inch Tylags. The safe working load for ½-inch is 5,000 pounds; for ¾-inch, 9,000 pounds, and for 1-inch, 14,000 pounds; all 2-strut ties. Safe load for 1-inch 4-strut Tyscrus with special alloy Tylags is 25,000 pounds.

Economy—The purchase of various types of clamping devices is often an unwarranted expense because the first cost is high, the number of reuses on any one project limited in many instances, and deterioration and loss make inroads on the investment. *Only Tyscrus themselves are purchased. All working parts for ½ and ¾-inch Tyscrus—Tylags, Tycones, and Flat Washers are returnable for full credit.*

Working Parts for Tyscrus, Tyloops, Tyhangers, etc.

Tylags (lag screws) are specially made from bolt finished stock. They have only five turns of thread per inch, and sufficient thread to furnish a variation of 6 inches in wall thicknesses. They do not bind, and are easily removed from the concrete.

Tycones are made 1 and 2 inches long, of malleable iron, are without threads, and are easily removed with a wrench.

Tylag (Lag Screw)

Application Methods

Richmond Tyscrus are widely used on ordinary building foundation work. In this application the ½-inch diameter tie acts as both spreader and tie for walls up to 36 inches thick, and the ¾-inch diameter tie for walls up to 8 feet in thickness. (If a considerable number of reuses of built-up panels is intended, ½-inch standard cut washers should be used at ends of ties.) With ½-inch Tyscrus in walls over 3 feet thick or with ¾-inch Tyscrus in walls over 8 feet thick, spreaders are required. By this method, steel is kept as much as 3 inches from the wall surface, and the work of pointing minimized.

Under conditions where the Tyscru is used as a spreader and it is required that the tie shall be 1 or 2 inches back of both wall surfaces; Tycones, as illustrated below, are used on both ends of the tie. When cones are removed the sockets left make for a secure anchorage of the grout plug.

Usual Application Method of the Tyscru

Water-Seal Tyscrus for Watertight Construction

Richmond ½-inch Water-Seal Tyscrus are made with $\frac{1}{16}$ x $\frac{11}{16}$-inch washers swedged to to each strut of our regular Tyscru.

These washers break the surface continuity of tie rods within the concrete wall and prevent any seepage of moisture along the struts. Recommended for high head concrete reservoir and tank walls. Strength 8,000 pounds ultimate; 5,000 pounds safe.

4-Strut Tyscrus for Heavy Construction

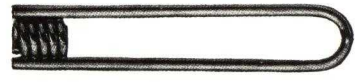
One inch 4-Strut Tyscrus are designed for use where extreme tensile strength and rigidity as a spreader governs selection of a form tie for heavy concrete construction. Strength 35,000 pounds ultimate when used with steel alloy lag screws.

RICHMOND TYLOOPS

Tyloops find wide use in engineering structures where it is impractical to use ties fabricated to exact wall thickness. They are used with Tylags and washers, and also with Tycones, when setting the loop for later anchoring of forms.

The Tyloop is fastened with wire to hooked rods or another Tyloop. The coil is designed for ½, ¾ and 1-inch Tylags. The strength of the assembly is the strength of the connecting wires.

The 4-Strut Tyloop is designed for cantilever form anchorage in massive concrete structures. Strength 18,000 pounds, ultimate, when used with mild steel lag screws.



Single Tyloop

4-Strut Tyloop

Retaining Battered and Warped Walls

The method shown in Fig. 1 is used for tying down the battered side of retaining and wing walls. A hairpin dowel or Tyloop is placed in the footing before the concrete has set.

Tyloops provide an economical and practical method for tieing forms for warped walls, with a constant batter and varying height, or with a varying batter, as shown in Fig. 2.

Tyloops are set in the forms as shown in Fig. 3 for anchoring cantilever forms in mass concrete construction. Tyloops will also aid, if used as shown, in dams and other structures which are poured in lifts and are too massive to tie from face to face.

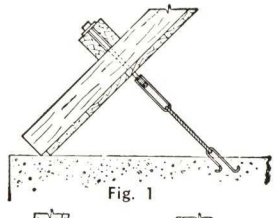


Fig. 1

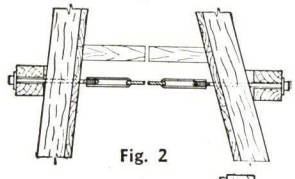


Fig. 2

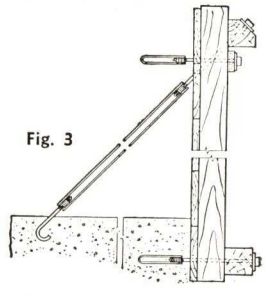


Fig. 3

All working parts for ½ and ¾-inch Tyscrus are returnable for full invoice credit. All working parts for 1-inch Tyscrus are special

RICHMOND TIE RODS AND FORM CLAMPING ASSEMBLIES

Not recommended for water-tight walls—because—any rod system, threaded or not, allows the bond between the concrete and the rod to be broken, leaving a capillary condition. Tyscrus, particularly the water seal type, guard against disturbances such as all rod systems are subjected to. The coarse thread of the Tyscru Coil acts as a foolproof receptacle for the finished patch.

RICHMOND TILT LOCK CLAMPS

Assembled rods of this type can be inserted in holes drilled in forms already erected and removed without even stripping the forms. The Tilt Lock has the speed of other devices to seat a clamp handle on the rod at the wale, *plus absolute safety.*

Outside rods are ¾-inch diameter with ⅞-inch threads. Threads are rolled cold, and are thus almost impossible to damage. Rods are machined to a taper after tapping. Inner rods are kept any specified distance back from the wall face, or can be entirely removed from wall. Outside rods 20 or 26 inches long accommodate any dimension of form lumber and set backs.

Strength—Tests indicate the ultimate strength of Tilt Locks to be 13,500 pounds maximum for ½-inch rods. The recommended working load for these rods is 9000 pounds, which is far beyond that of any inside threaded rod.

Operation—The Tilt Lock Clamp handle is designed so that the first of the upper half of its threads is a half inch beyond the last thread of the lower half. When tilted slightly (Fig. 1) the clamp slides along the rod until it touches the wale, where it is seated. From this point (Fig. 2) three complete turns brings it tightly against the wale. *It is absolutely foolproof as it takes three full turns backward before the clamp can be unseated from the rods.*

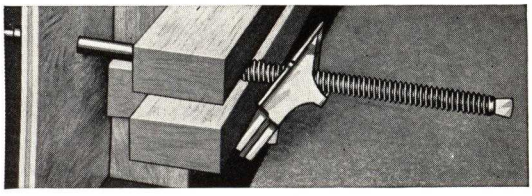
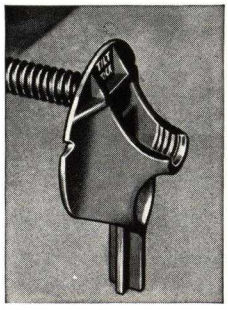


Fig. 1. Tilted Position



Clamps Are Designed for Use as a Wrench to Remove Outer Rods

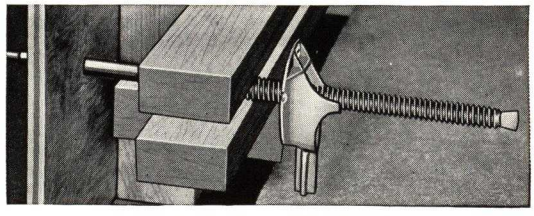
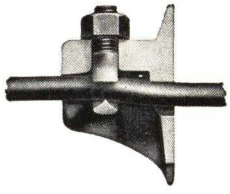


Fig. 2. Seated Position

SUPERIOR ROD CLAMPS



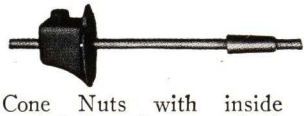
Superior Rod Clamp

Illustration shows principle by which the positive, non-slip grip is attained

The primary advantage of plain round rods for form ties is that they do not have to be prefabricated to wall thickness. The contractor needs only a sufficient quantity of plain rods in stock length and a sufficient quantity of clamps. Cutting, threading or waiting for factory shipment of prefabricated ties is thus eliminated. The improved rod clamp shown here is sound in principle and efficient in application. It grips the rod to the breaking point without slipping. The rod is clamped by drawing up against two shoulders and turning down a nut on the eyebolt. Condition of the eyebolt is always visible without the necessity of removing the clamp as the clamp is open at the bottom.

These clamps are designed for sufficient bearing on the form lumber, are deeply notched in three places for nailing, and are the best castings obtainable.

CONE NUTS AND THREADED RODS

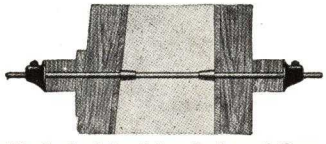


Cone Nuts with inside threaded tie rods act as *both spreader and tie.* When the forms are stripped, the cone are removed and the rod holes grouted.

The threads on the tie rod act as an anchor for the grout, and the remaining steel of the tie is kept back of the face of the wall, thereby meeting specifications for exposed finished walls.

Cone Nuts are made from steel bars, drilled and tapped before turning to insure absolute concentricity, taper is large, allowing removal from wall.

Inside rods are accurately cut to length, correctly threaded so that when the cone nuts are snug at the end of the thread the out-to-out dimension is exactly the wall thickness.



Method of Applying Rods and Cone Nuts to Walls Finished on Both Sides

Method of Application on Walls Which Are to Be Faced on Only One Side

RICHMOND SCREW ANCHORS AND BOLTS

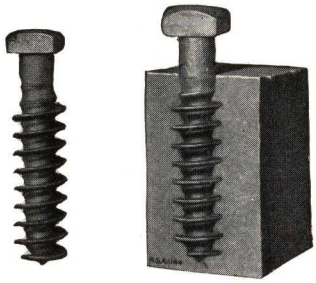
Illustration Shows the Anchor Bolt and Anchor Unassembled

Richmond Screw Anchors are used wherever a strong and secure fastening to concrete is required. Bolts can be removed and replaced at will.

In application the screw anchor containing the bolt is fixed to the forms before pouring concrete. They are placed in *finished* concrete by drilling a hole, setting screw anchor and bolt together in it, and turning the bolt out later. All stresses are transferred to the surrounding concrete and the anchor cannot loosen without the destruction of the entire surrounding masonry.

Sizes and Placing Data

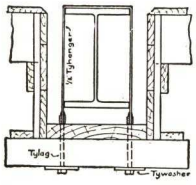
Bolts should extend into the concrete ten times their diameter; when this is done tests indicate that the bolt fails before the anchor can be pulled out. Bolt and anchor should be set ¼ inch deeper than final position of bolt to allow for tightening up.



Anchor Bolt and Anchor Combined and Inserted in Concrete

RICHMOND HANGING SYSTEMS

For Hanging Forms from Steel Beams



Tyhanger and Application Detail

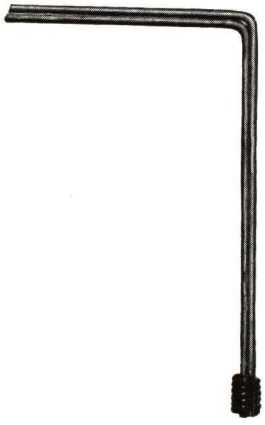
TYHANGER

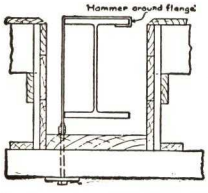
The Tyhanger, as shown at left, is a strong, simple and safe method of hanging forms from fireproofed structural steel. It is the Tyscru fabricated to go over the beam, using lag screws and washers as shown in the detail below. All erection can be accomplished from above. The ½-inch Tyhanger (diameter of the Tylag) supports a safe working load of 3000 pounds on each leg, a total of 6000 pounds. No spacers are required to space soffit forms.

Unfinished Work—Tyhanger legs are figured long enough to end flush with the soffit form. No finishing grouting patch is applied.

Finished Work—Tyhanger legs are figured long enough to end ⅛ inch above soffit form, ½ inch standard cut washers space soffit from end of hanger. Removal of the washers leaves a recess for the finishing patch.

Specification Work—Tyhanger legs are figured long enough to end at a specified distance from the soffit form. Temporary spacers are required between beam flange and soffit form. The recess is grouted following the removal of Tylag.





Hanger Ty and Application Detail

HANGER TY

The Hanger Ty is used where beam bottom cleats are continuous under two or more beams. It has a safe working load of 1500 pounds, when made from .220 wires. With .300 wires it is safe at 2500 pounds, and with ⅜-inch wires it is safe at 3500 pounds, when used with ½-inch Tylags.

Fascia Ty

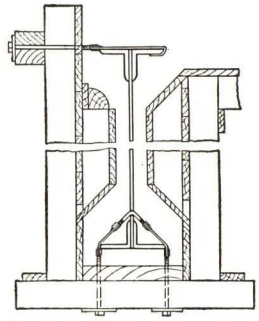
FASCIA TY

The Fascia Ty holds in the beam side on spandrel beams and girders. The small hole left by the ½-inch Tylag is easily grouted and secures the required finished appearance. It is safe for 500 pounds with .220 wires; 800 pounds with .300 wires, and 1200 pounds with ⅜-inch wires.

Girder Ty

GIRDER TY

The Girder Ty is placed through shop fabricated holes in girders where fireproofing is as shown in the detail. The lower ends of the Ty are bent at the flange to receive Tylags. This is an easy solution of a difficult forming operation. 6000 pounds is safe.



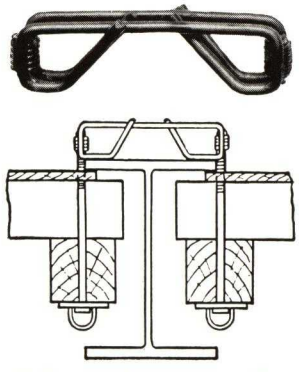
Method of Using the Fascia and Girder Ty

HANGER FRAME TYS AND SADDLE TYS

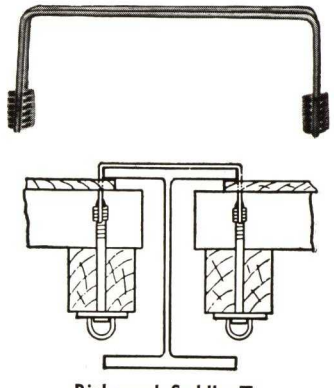
The Saddle Ty (below at right) has a capacity of 6000 pounds, and is used with ledgers to carry deck forms on non-fireproof structures. It is quick to erect, and has a considerable variation due to the Eyelag. It makes for easy assembly from the top, as is shown in the detail.

The Hanger Frame Ty (below at left) is used where specifications do not permit any exposed steel. Holes left by the ½-inch Eyelags are quickly grouted. Supporting capacity 6000 pounds.

Both ties are assembled with ledgers of convenient length before placing over beam.

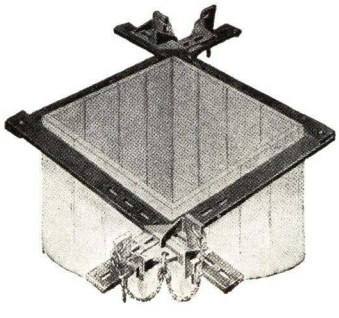


Richmond Hanger Frame Ty



Richmond Saddle Ty

All working parts are returnable for full invoice credit



SYMONS EVER SQUARE COLUMN CLAMPS

A standard, reliable and high quality clamp for square column forms. Arms are of chrome alloy steel with adjusting wedges chained to the clamp. They are obtainable at all times for either rental or sale.

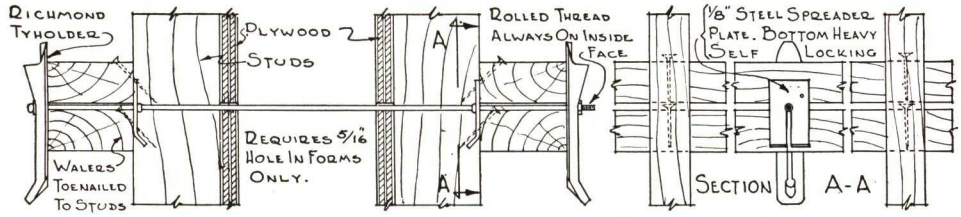
SIZES AND SPECIFICATIONS OF SYMONS EVER SQUARE COLUMN CLAMPS

Size of Clamp, inches	Arms made of Chrome Manganese Alloy Steel, inches	Size of Columns (over all), including forms (square or rectangular) for which clamps are suitable, inches	Weight, pounds
36	2 x $\frac{5}{16}$x36	29x29 down to 10½x10½	29
48	2½x$\frac{5}{16}$x48	40x40 down to 16 x16	50

RICHMOND FORM-TY FOR ARCHITECTURAL CONCRETE

3000 Pounds Safe Working Load

All Tys can be placed with both sides of form in place. All walers have to be toenailed to studs. Spreader plates are put on before placing tyholders. To strip, cut Ty rod between waler and sheathing on threaded end. Remove spreader plate from other side and Ty can be removed while forms are still in place. This prevents all spalling and leaves only a $\frac{7}{32}$-inch hole in wall.



Features—

(1) Minimum size hole to patch.
(2) No wood spreaders.
(3) No spreader marks on face of concrete.
(4) Ty removes without spalling concrete.
(5) Rigid form support.
(6) Accurate uniform wall thickness.
(7) Average cost ½c per square foot of forms.

Spreader Plates are loaned, no rental or handling charge. Tyholders are loaned subject to nominal handling charge.

RICHMOND FLEX-TY

5000 Pounds Safe Working Load

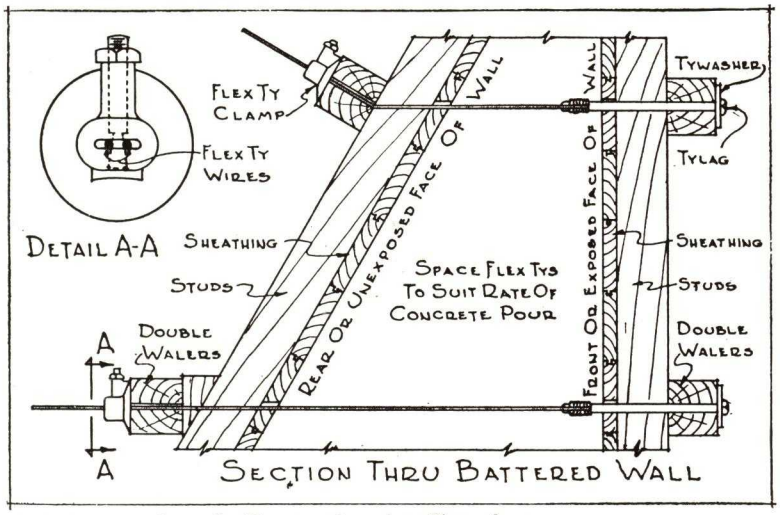
Richmond Flex-Ty for warped, arc and chord, battered, and multiple battered walls.

A standardized length of ty fits varying wall thicknesses. A Ty with the flexibility of a snake wire; yet strong enough to break a ½-inch diameter bolt. A Ty with all the conveniences of wire, band or plain rods.

Strong—Guaranteed 5000 pounds safe load per Ty without slip or stretch. Ultimate strength 8000 pounds.

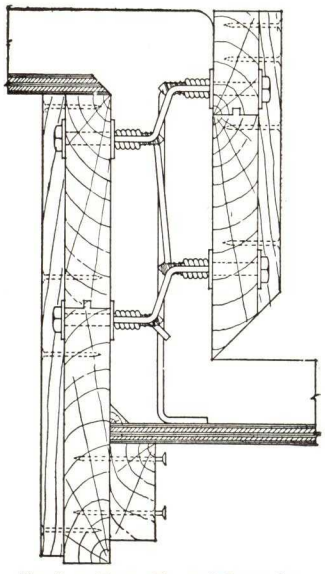
Light, fast and easy to install and strip.

Meets specifications which require Ty end to be set back from wall face. No rod couplings, no rod pulling, no chipping back in concrete.



Flex-Ty Clamps, Tywashers and Tylags are loaned. No rental or handling charge.

RICHMOND TYFRAME FOR STADIUM CONSTRUCTION



Used as Form Ty and Spreader

Richmond Tyframes are manufactured to accurately fit the individual job conditions and specifications.

Advantages—

(1) Rigidly strong forms; not distorted by workmen walking on forms.

(2) Exact riser and tread thicknesses.

(3) Exact spacing or anchorage for seat bracket.

(4) Deck free of obstructions for finishing immediately after pouring. Eliminates raking timbers, cleats and braces.

(5) Typical form panels are reusable merely by removing from old position and bolting to Tyframes in new position. No wrecking or rebuilding of riser forms involved.

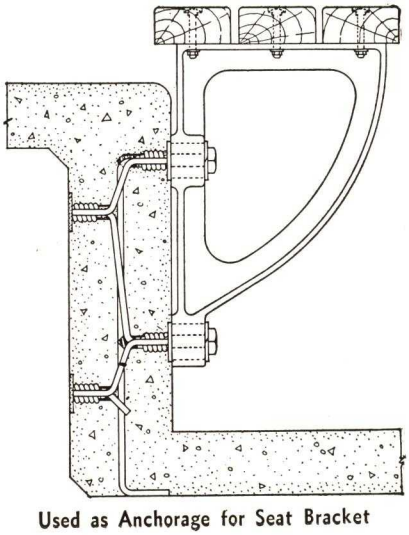
(6) Reduces ultimate cost of job. Have been used by contractors, for low cost operation.

(7) Have been used on WPA projects, for simplicity and convenience with unskilled labor.

(8) Working parts are returnable for full credit.

(9) Forms are erected faster, cement finishing is faster, forms are stripped and reset faster, seat brackets are placed faster; earlier completion brings gate receipts in faster.

Note: Tell us your Riser and Slab thickness and Riser Height and we will send you a typical detail for your information.



Used as Anchorage for Seat Bracket

UNION STEEL PRODUCTS CO.

"Union" Reinforced Concrete Specialties

408 Pine Street
ALBION, MICHIGAN

Peerless Wedge Adjustable Shelf Angle Support

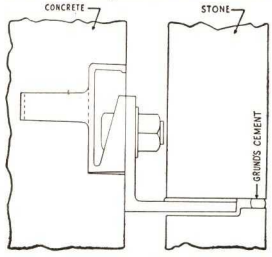
The Peerless Wedge is a powerful insert designed to securely hold, in properly adjusted position, the shelf angles commonly used to carry veneer or exterior facing of building walls.

US 425—for the 5/8-in. Bolt
US 436—for the 3/4-in. Bolt
(Patented)

The vertical adjustment is provided for by the slotted opening in the face of the insert. The method of locking the shelf angle in its properly adjusted position is provided by the inside sloping faces that make up the slides of the slot mentioned above and a special askew head bolt on which the angle of offset of both is exactly the same, insuring the greatest possible amount of bearing of head against the shoulders of the Peerless Wedge which in turn insure slip-proof locking of the shelf angle in position without depending upon friction. Notice the lower picture which gives a sectional view.

The Peerless Wedge is very easily applied to the inside of the form at the exact position where it is designed to be by the architect or engineer and held in place by three common nails, holes for which are provided in the Wedge casting. No drilling of the forms is necessary because bolts are not inserted until the actual operation of placing the shelf angles is taking place.

The Peerless Wedge is particularly advantageous to install in hard-to-get-at places because it eliminates awkward projections from the wall which complicates the setting of the exterior facing. This also reduces to a very minimum the amount of chipping of this material and generally speeds up the entire operation of stone setting. The angles are placed only when the exterior facing comes up to the level at which these angles are to be placed.



The Very Nature of a Shelf Angle Makes It Impossible to Place a Load on Any Except an Eccentric Basis
(Patented)

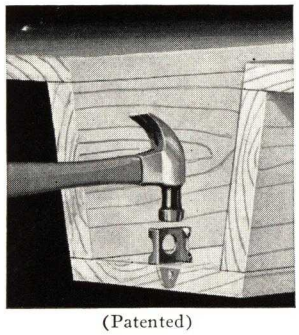
Special length bolts can be supplied up to 3 in. Can be furnished with *Rust-proof Plating*

The Peerless Wedge is designed to take care of all eccentricity of the load and also to hold this with a very fine margin of safety.

The 5/8-in. size has been tested for loads almost up to 5 tons and the 3/4-in. size has held 5 tons per Wedge, both of which are considerably in excess of the safe loading of the shelf angles themselves and in excess of recommended loading on the wedges. Although under ordinary circumstances it will never be necessary, under extremely peculiar circumstances it might be desirable, to put a reinforcing bar through the loop of the insert for additional bond.

The Peerless Wedge is made of high grade malleable iron and it is so cast that under all working loads there shall be no spring nor distortion of the metal. Rigidity which is essential in a wall support is an inherent quality of the Peerless Wedge.

Nailer Ceiling Insert

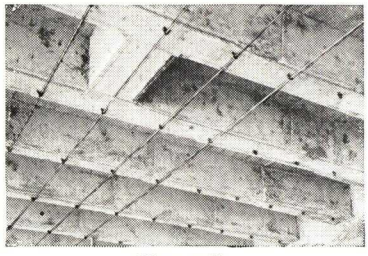


(Patented)

The Nailer Ceiling Insert is, we claim, the most practical and economical of ceiling supports on the market.

It is made of 14-gauge hard steel in such a manner that it can be driven into the forms wherever a hanger is desired and upon removal of the forms the blade with a hole for a pencil rod or wire or strip metal hanger is exposed beneath the concrete. Each insert will hold approximately 1000 lbs. in good rock concrete.

Use of the Nailer Ceiling Insert permits the installation of either ordinary metal lath or hi-rib. Another important feature is that the form lumber is not destroyed or damaged but can be used just the same as if no Nailer Ceiling Insert had ever been driven into it and all of these features make this a very economical installation.



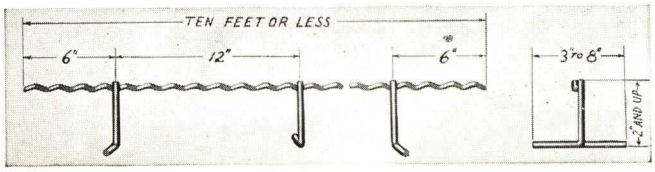
(Patented)

Inserts

Malleable and Tapped Inserts of several types for 1/4-in. up to 3/4-in. bolts are included in the Union Line, and we have made or have producing facilities for all kinds.

Continuous Hi Chairs

Continuous Hi Chairs are used to support the top bars in slabs or the bent-up bars at columns, beams or girders. This Continuous Hi Chair is more rigid and the height is more uniform and exact than when individual high chairs and rods are wired together.



(Patented)

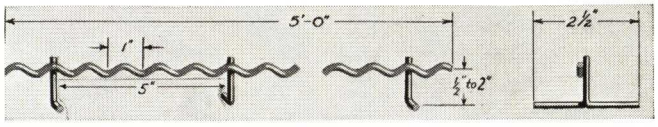
No assembling or nailing to forms necessary. The supporting bar has L-shaped legs rigidly welded every 12-in. along its lengths. Place the Continuous Hi Chair strip in the proper place on the forms and they are ready to support the steel. Ideal for metal deck forms.

Continuous Hi Chairs are *rigid* and *strong*. They are made of $\frac{5}{16}$-in. hard steel wire. The vertical L-shaped support every 12-in. prevents sagging and will easily hold up bars under the severest treatment. The corrugations in the top bar prevent the reinforcing bars from sliding together or apart.

Cost is 10% to 25% less than header bars and individual Hi Chairs.

Continuous Slab Bar Spacers and Beam Bar Spacers

Continuous Slab Bar Spacers and Beam Bar Spacers are similar in construction to the Continuous Hi Chair, except that the legs are spaced 5-in. centers and 2-in. centers, respectively, and made of wire sizes that meet the requirements of the Concrete Reinforcing Steel Institute specifications.



(Patented)

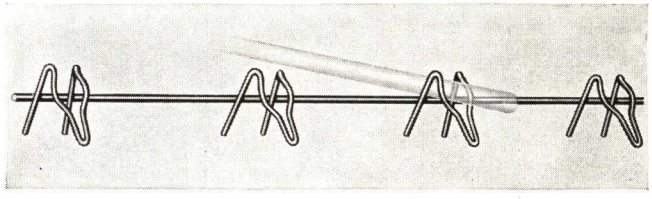
"Measuring Stick" Convenience—The US-70 Slab Bar Spacer shown above illustrates a very valuable feature—*the uniform 1-in. corrugations.* This known quantity is a great help in placing the reinforcing steel—makes it easy to judge the spacing of the bars instantly with the eye. This saves steel setting time and discussions when inspected. In 5-ft. lengths with 1-in. corrugations, an otherwise complicated looking slab job is clearly "organized" from the start, and turns out to be a neater job.

Snap-In Slab Spacers

Support, space and tie the bars.

The supporting clips are welded along the longitudinal rod any desired spacing. The steel setter merely places the continuous strips on the forms and snaps the bars in place. Each bar is rigidly held in place and supported by three legs directly under the bar.

Snap-In Slab Bar Spacers are made to order in lengths

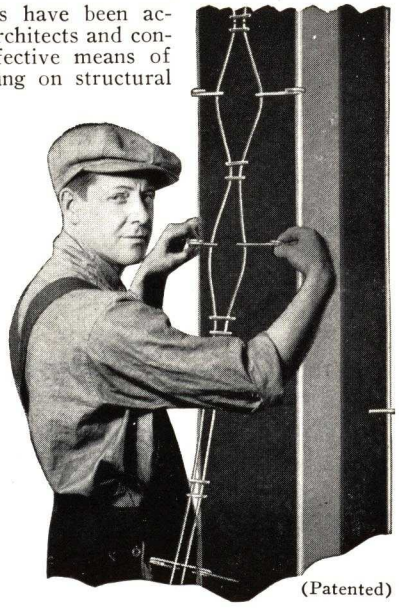


Snap-In Slab Spacers US 117
(Patented)

not to exceed 10 ft., and the clips are spaced at any desired spacing. They are made in ½, ¾, 1, 1½ and 2-in. heights. The Snap-In clips will hold ⅜, ½ and ⅝-in. bars.

Snap-In Beam Bar Spacers that lock in place regular beam reinforcing bars are supplied similar in construction to Snap-In Slab Bar Spacers but of wire heavy enough to take care of the heavier loads which they support.

Expansible Reed Clips



(Patented)

Reed Expansible Clips have been acknowledged by leading architects and contractors as the most effective means of reinforcing the fireproofing on structural beams and columns.

The clip is made in convenient 4 and 4½-ft. lengths.

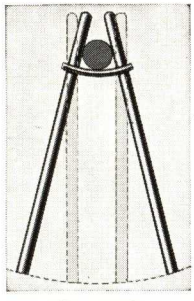
Two widths of clip wrap all flanges from 3 to 16-in. wide.

On the average job the cost of Expansible Clips will be less than any other form of wrapping.

Reed clips do not obstruct the flow of concrete; cannot be dislodged from the flanges during the pouring operation; and being so open, do not cause voids in the concrete.

They are made of No. 12-gauge galvanized wire, electric welded at every joint. They are also made of No. 10-gauge wire to comply with requirements of Federal specifications.

U-Lock Hi Chair



(Patented)

The U-Lock Hi Chair is the only Hi Chair on the market that locks the supporting bar in place.

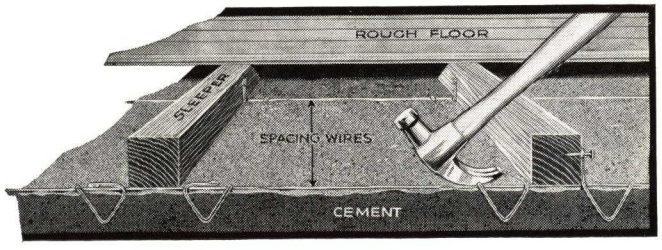
These chairs are shipped to the job with the top open and by placing the support bar in its seat and spreading the legs the bar is locked and the chair is part of the complete supporting unit, which can be moved around at will as the job requires.

The U-Lock Hi Chair provides four supporting legs with the ends of each support in contact with the form and with sufficient spread to prevent tipping.

It is made in any height from 2-in. up and of heavy hard steel wire which varies in size according to the height.

Sleeper Anchors

The Union Continuous Sleeper Anchor provides the most economical and satisfactory way of anchoring wood sleepers or screeds on any construction where wood floors are to be placed on top of concrete slabs.



(Patented)

Each pair of clips welded to the spacing bar forms a perfect and complete anchor for each wood sleeper which will provide solid floors and eliminate squeaks.

The anchors themselves are easily placed and depending on center to center spacing they are placed either four or five at a time without the necessity of measuring or using templets. Merely start at one side of the building and work across and you know the results will be satisfactory.

WICKWIRE SPENCER STEEL COMPANY

GENERAL OFFICES
41 East Forty-second Street, NEW YORK, N. Y.

OFFICES AND WAREHOUSES
WORCESTER, MASS., 80 Webster Street
CHICAGO, ILL., 221 No. La Salle Street
LOS ANGELES, CAL., 214 No. Alameda Street
BUFFALO, N. Y., 70 Niagara Street
SAN FRANCISCO, CAL., 101 Townsend Street
PORTLAND, ORE., 1127 Northwest 16th Ave.

Product

CLINTON ELECTRICALLY WELDED WIRE FABRIC for Concrete Reinforcement.

For our pages on Chain Link and Iron Fences and Gates, Woven Wire Lath, Metal Grilles, and Radiator Enclosures, see File Index.

Clinton Electrically Welded Wire Fabric Scope of Use

Clinton Electrically Welded Wire Fabric is the ideal mesh reinforcement for concrete. It is extensively used in concrete floors, walls, roads, sidewalks, pipe, sewers, reservoirs, levees and all forms of concrete slab construction.

When used to reinforce floor slabs the larger longitudinal wires are located in line of greatest stress while the transverse members arranged at right angles to the longitudinal afford the most efficient means of distributing concentrated loads in a direction perpendicular to the main reinforcing members.

Because of its effective lateral as well as longitudinal strength, Clinton Welded Fabric is particularly efficient in resisting stresses caused by temperature changes.

Material—It is a square or rectangular wire mesh with its points of intersection electrically welded and can be furnished in various gauges of wire and spacings. The wire used in manufacture is a special grade of high quality steel wire that has a minimum tensile strength of 70,000 lbs.

Finish—Clinton Electrically Welded Wire Fabric can be furnished with either plain steel or galvanized wire.

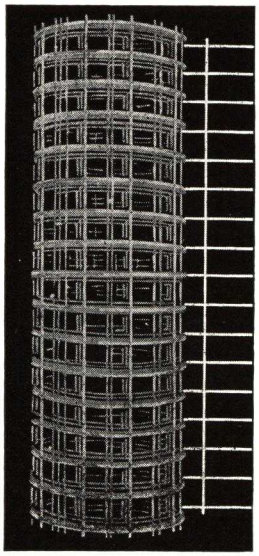
Economy and Accuracy of Installation

The fabric is delivered in rolls or sheets. Rolls any desired length not exceeding 150 ft. for heavy sizes and 400 ft. for light sizes. Great quantities can be placed quickly and accurately by unskilled labor, with the assurance that every strand is in its proper position. This renders it a simple, safe and most economical reinforcing material for all forms of slab construction.

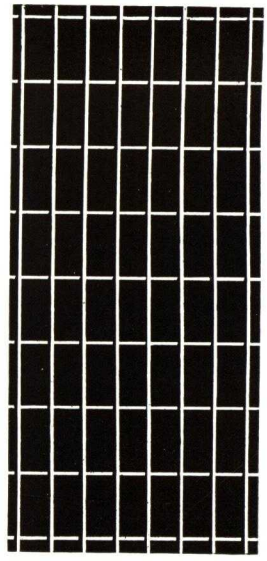
STANDARD SIZES—CLINTON WELDED FABRIC

Style No.	Spacing of wires		Size wires W&M gauge		Sec. area of steel per ft. width, sq. in.		Weight per 100 sq. ft., lbs.
	Longitudinal	Transverse	Longitudinal	Transverse	Longitudinal	Transverse	
2x16 2/8	2	16	2	8	.325	.015	119
2x16 3/8	2	16	3	8	.280	.015	104
2x16 4/9	2	16	4	9	.239	.013	89
2x16 5/10	2	16	5	10	.202	.011	75
2x16 6/10	2	16	6	10	.174	.011	65
3x16 2/8	3	16	2	8	.217	.015	83
3x16 3/8	3	16	3	8	.187	.015	72
3x16 4/9	3	16	4	9	.160	.013	61
3x16 5/10	3	16	5	10	.135	.011	52
3x16 6/10	3	16	6	10	.116	.011	45
4x16 3/8	4	16	3	8	.140	.015	56
4x16 4/9	4	16	4	9	.120	.013	48
4x16 5/10	4	16	5	10	.101	.011	40
4x16 6/10	4	16	6	10	.087	.011	35
4x16 7/11	4	16	7	11	.074	.009	30
4x12 8/12	4	12	8	12	.062	.009	26
4x12 9/12	4	12	9	12	.053	.009	22
4x12 10/12	4	12	10	12	.043	.009	19
4x12 12/12	4	12	12	12	.026	.009	13
5x9 12/12	5	9	12	12	.021	.012	12
6x12 0/6	6	12	0	6	.148	.029	65
6x12 3/3	6	12	3	3	.093	.047	51
6x12 4/4	6	12	4	4	.080	.040	44
6x12 5/5	6	12	5	5	.067	.034	37
6x12 6/6	6	12	6	6	.058	.029	32
2x2 12/12	2	2	12	12	.052	.052	37
2x2 14/14	2	2	14	14	.030	.030	21
3x3 10/10	3	3	10	10	.057	.057	41
3x3 12/12	3	3	12	12	.035	.035	25
3x3 14/14	3	3	14	14	.020	.020	14
4x4 6/6	4	4	6	6	.087	.087	62
4x4 8/8	4	4	8	8	.062	.062	44
4x4 10/10	4	4	10	10	.043	.043	31
4x4 12/12	4	4	12	12	.026	.026	19
4x4 13/13	4	4	13	13	.020	.020	14
4x4 14/14	4	4	14	14	.015	.015	11
6x6 2/2	6	6	2	2	.108	.108	78
6x6 3/3	6	6	3	3	.093	.093	68
6x6 4/4	6	6	4	4	.080	.080	58
6x6 5/5	6	6	5	5	.067	.067	49
6x6 6/6	6	6	6	6	.058	.058	42
6x6 8/8	6	6	8	8	.041	.041	30
6x6 10/10	6	6	10	10	.029	.029	21

Above sizes regularly used—other sizes can be furnished upon request.



Roll of Clinton Electrically Welded Wire Fabric, 48-in. Width
Shipped also in sheets if desired



Sheet of Clinton Welded Fabric
Also furnished in rolls when desired

THE BULL DOG FLOOR CLIP CO.

108 North First Avenue, WINTERSET, IOWA

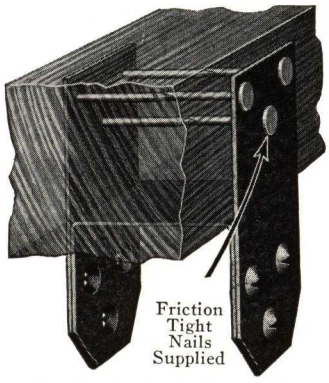
163 BRANCH REPRESENTATIVES AND 20 CONVENIENT DISTRIBUTING PLANTS

BULL DOG FLOOR CLIPS CUT MATERIAL AND LABOR COSTS

The use of Bull Dog Floor Clips to secure strips or sleepers for wood floor laid over concrete assures both structural efficiency and economy.

Rigid tests indicate that firm anchorage is assured when our instructions are followed. This means a firm level floor, no buckle, dome, or squeak. Friction-tight nails for securing sleeper to clip are furnished gratis with all Bull Dog Floor Clips.

When Bull Dog Standard width (1¼ in., illustrated) or Bull Dog Super Junior width (13/16 in.) is used, no fill is necessary or required. Dead air space eliminates dry rot.

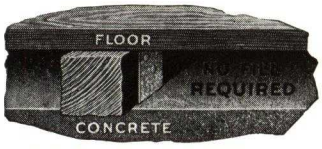


Standard Bull Dog Floor Clip

Economy

The use of Bull Dog Floor Clips saves 5¢ per sq. ft., because cost of material and labor for a concrete fill is eliminated. Bull Dog Clips can be placed rapidly, and sleepers can be laid 50% faster than if anchored by a fill material. Clips spaced 16 in. on centers require 576 anchors per 1000 sq. ft. of floor slab. This reduces dead load 18,000 lb. per 1000 sq. ft. of floor area, which means a proportionate reduction of reinforcing steel.

Quick delivery is assured at all times. We have 163 representatives throughout the United States with stocks maintained at 20 well-located shipping points.



Bull Dog Standard Without a Fill

Bull Dog Junior Where Fill Is Required

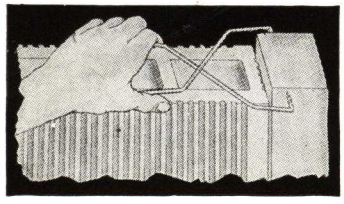
Where Ordinances Require a Fill

With a fill, it is not necessary to use the Standard or Super Junior Bull Dog Clip. The Junior ⅝-in. wide (see table) is suitable for this type of construction and effects a still greater saving in anchoring floors to concrete. With sleepers spaced 16 in. on centers and clips spaced 30 in. on centers along each sleeper 300 clips are required for each 1000 sq. ft. of slab at a cost of *$6.00.* This cost is more than offset in the time and expense of bracing the strips, beveling, etc., and a large saving in expense of fill, material and labor.

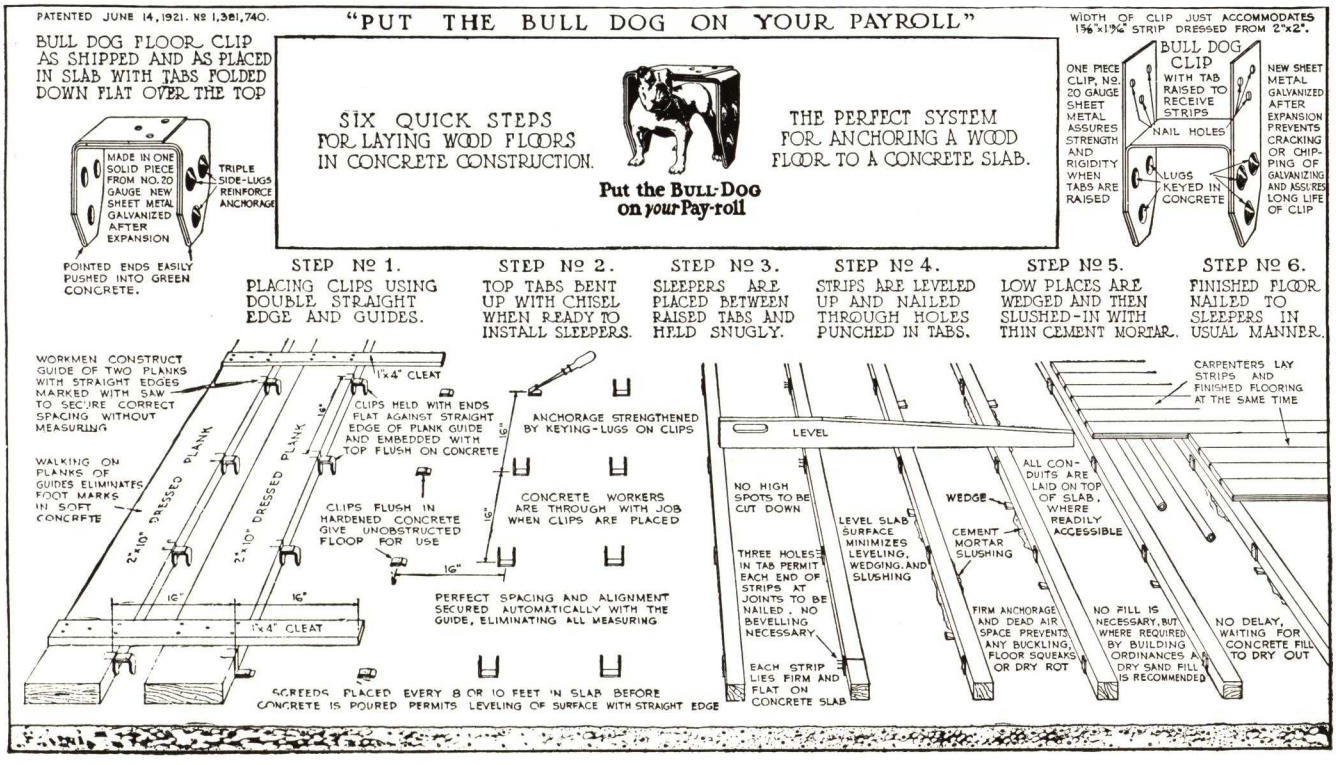
BULL DOG FLOOR CLIPS FOR WOOD FLOORS ON CONCRETE NOW MADE IN THREE WIDTHS

Types	Width of G. I. metal strips	Gauge metal used	Prices	Sizes
Standard..... Used without fill	1¼ in.	20 ga.	2-in. $35.00 M 3-in. 40.00 M 4-in. 45.00 M	Each type available in three sizes to fit 2, 3, or 4-in. dressed sleepers
Super Junior..... Used with or without fill	13/16 in.	18	All sizes $25.00 M	
Junior..... Used with fill	⅝ in.	18	All sizes $20.00 M	

New Bull Dog Buck Anchor



This buck anchor, as used in tile or other types of masonry partitions, is a time saver. It is efficient, strong, and economical. Literature and details are available. For 3-in. and 4-in. bucks.



ANKORTITE PRODUCTS, INC.

FORMERLY FLOOR ACCESSORIES CO., INC.

Manufacturers of Distinctive Building Products and Accessories

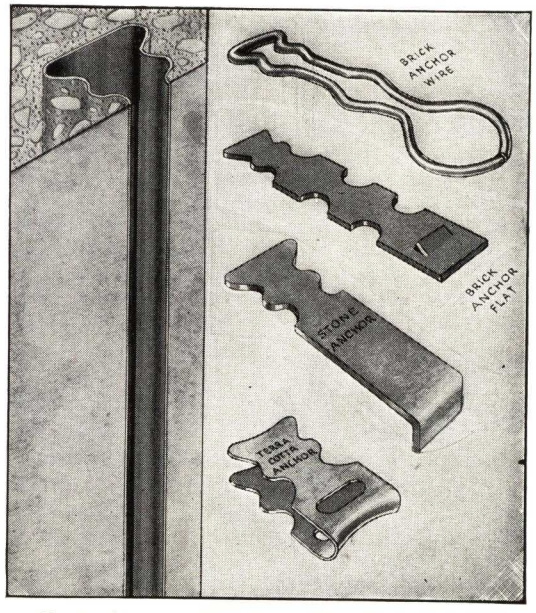
KANSAS CITY, MISSOURI

AGENTS IN PRINCIPAL CITIES

ANKORTITE MASONRY SLOT AND ANCHORS

(Slot and Anchors covered by U. S. Patents)

Ankortite Masonry Slot and Anchors provide an adjustable method of anchoring brick, stone and terra cotta facings to concrete with the highest degree of strength, and substantial economies in time and labor.

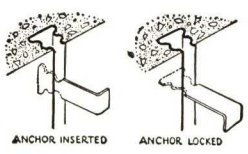


Slot in Concrete After Forms Have Been Removed
Also the four types of anchors used for different kinds of masonry

Ankortite Dovetail Type Slot

The slot is nailed inside the concrete forms and when cast in the concrete becomes an integral part of the building. The anchors are keyed into the slot by a quarter turn and may be placed in any location vertically to correspond with the mortar joints as the masonry courses are built up, eliminating the necessity of measuring for course heights.

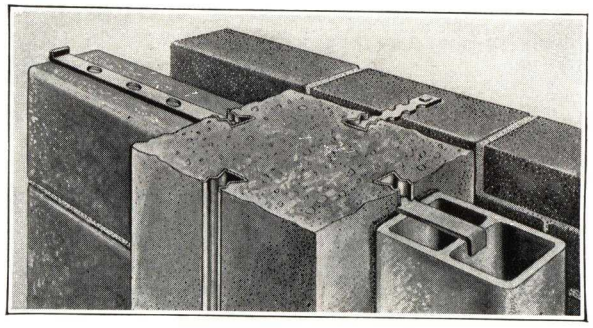
The simplicity of the Ankortite method makes it an extremely economical system of anchorage since the anchors key in quickly without chiseling away a wood strip or overcoming other impedients to fast work. At the same time it provides a far stronger and more satisfactory anchorage than any usage of wires.



Wood blocks conforming to the contour of the slot are furnished to prevent concrete from entering at the ends and nail holes are punched in the back of the slot for nailing it to the forms.

Application of Anchors (With Slot)

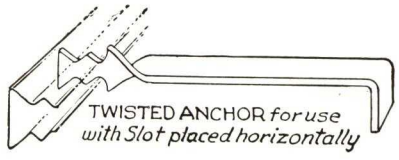
Illustrated below is a concrete column showing application of the various types of anchors. The long anchor, which extends 12 in. into the mortar line, is used in hollow tile walls



where the units are laid horizontally while stone anchors are used when the units are placed vertically.

Where a closed slot is desired, a continuous felt filler can be furnished at slight additional cost, in lieu of the wood blocks.

In spandrel beams, etc., the slot can be placed horizontally and the anchors twisted a quarter turn to lie flat in the mortar line.



Ankortite Slot is made from 24 or 22-gauge galvanized steel, the standard thickness being 24 gauge. The undulating sides give it added rigidity and maximum anchorage in the concrete while the two shoulders on each side of the anchors conforming to the shape of the slot give a four-fold anchorage and prevent looseness.

Typical Specification

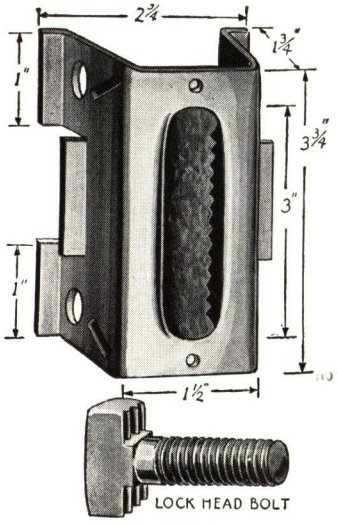
Anchor Slots—In all concrete columns, beams or walls to be faced with brick, stone or terra cotta the contractor for the concrete work shall furnish and install in a vertical position metal slots into which anchors are to be keyed and placed in the mortar lines of the masonry facing. These slots shall have longitudinally corrugated sidewalls for engaging the anchors and shall be made of 24-gauge (22-gauge) galvanized metal. One slot shall be placed vertically in all columns up to 16 in. wide and two or more slots in wider columns. In all beam faces and walls the slots shall be spaced 16 in. on centers.

The masonry contractor shall furnish and install anchors suitable for the types of masonry used, the anchors to have contours on the ends that engage in the slot conforming with the corrugations in the sides of the slots. Anchors shall be made of galvanized metal not less than 12 gauge for stone facing, 14-gauge flat or No. 9-gauge round wire for brick facing and a double thickness of 16-gauge metal for terra cotta facing. Anchors are required in each slot, one or more to each stone, one or more to each piece of terra cotta and one anchor in each fourth course of brick facing.

Slots and anchors shall be Ankortite brand as manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo.

ANKORTITE SHELF ANGLE FIXTURES

In Steel or Malleable Iron



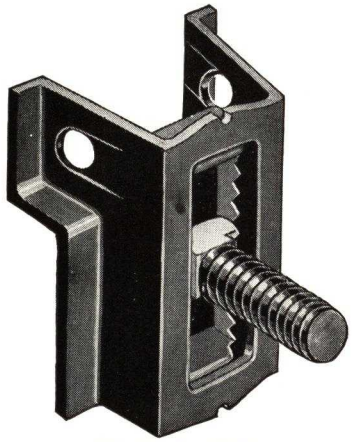
Pat. No. 1,929,835

Design of Steel Fixture

Bolt adjustment for anchoring shelf angles for carrying masonry facings is provided by Ankortite Shelf Angle Fixtures.

The fixtures consist of a rectangular box inside of which are serrations which mesh with notches on the bolt head and hold it firmly fixed when the bolt is tightened.

The fixtures are nailed inside the concrete forms and when the forms are removed they present a vertical slot 3 in. long in the face of the concrete. The diverging sides and outwardly extended flanges give them a tremendous hold with minimum concrete displacement, laboratory tests showing their load capacity is several times the weight ordinarily placed upon them even when the heaviest masonry facings are used.

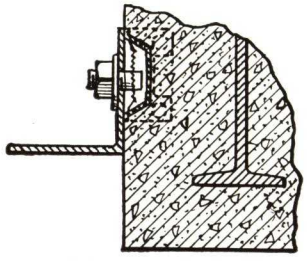


Pat. No. 1,933,536

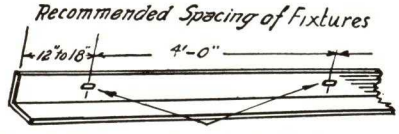
Design of Malleable Fixture

Ankortite Shelf Angle Fixtures are used in either steel frame or reinforced concrete construction and are generally spaced on 3 or 4-ft. centers. Their cost, therefore, is less per lineal foot of angle than ordinary bolts on 18-in. centers and in addition they show a great saving in time and labor required to bore holes and fasten bolts in the forms; to enlarge holes in the angles to receive misplaced bolts and to cut the masonry to fit fixed angles previously attached, since with this method the angles are placed as the masonry is built up, the angle being adjusted to its proper position as the bolts are tightened. Any necessity, therefore, for chipping or marring the masonry facing is eliminated. The locking feature of the bolt in the fixture absolutely prevents any movement after the angle is attached, as the fulcrum pull of the angles meshes the notches tighter as the load increases.

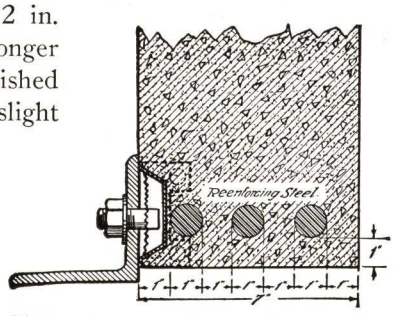
Ankortite Shelf Angle Fixtures are made of pressed steel (cadmium treated) or malleable iron. They are furnished with either ⅝ or ¾-in. lock-head bolts. Standard length of the ⅝-in. bolt is 1½ in and of the ¾-in. bolt is 2 in. under the head. Longer bolts can be furnished when necessary at slight additional cost.



In steel frame construction the Fixtures are placed in the concrete fire-proofing. This eliminates costly brackets attached to the structural steel



Slotted holes in angles provide horizontal adjustment of bolt and Ankorite Fixtures provide vertical adjustment



Fixture does not interfere with reinforcing rods, permitting them to be placed within one inch of face of concrete

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Ankortite Shelf Angle Fixtures have been used in many of the leading structures of the country in the last several years and have given imminent satisfaction not only to the contractors for their convenience and saving but also to the architects for efficiency as well as simplicity in eliminating the necessity of complicated steel details.

Typical Specification for Shelf Angle Fixtures

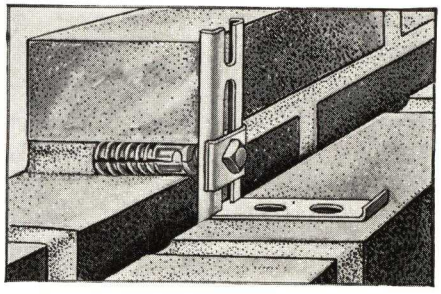
For anchoring shelf angles and lintels, place and nail in an upright position on the concrete forms steel [malleable] Ankortite Shelf Angle Fixtures as manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo.

These features to be spaced to correspond with punchings in the angles.

ANKORTITE WALL ANCHORAGE
For Fastening One Wall to Another

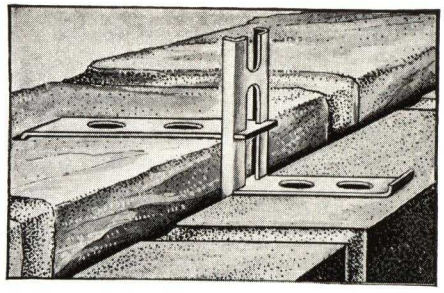
The problem of fastening a new wall to an existing wall or two new walls of different materials together is solved well and economically by this system which consists of a 16-gauge steel channel with oblong slots in the center permitting vertical adjustment of the anchoring devices which are placed in the mortar lines.

For attaching a new wall to an old wall of brick, stone or concrete, the old wall is drilled and expansion shields inserted into which lag screws are secured through a plate covering the channel. The anchors for the new wall then key into the slotted opening of the channel.



Method of Anchoring a New Brick Wall to an Old Wall of Brick, Stone or Concrete

For fastening a brick wall to a new stone wall channels are placed and the anchors attached in the stone wall as it is being built. The brick anchors then key into the channels as that wall is built.



Method of Anchoring a New Brick Wall to a New Stone Wall

All members are cadmium plated for rust protection.

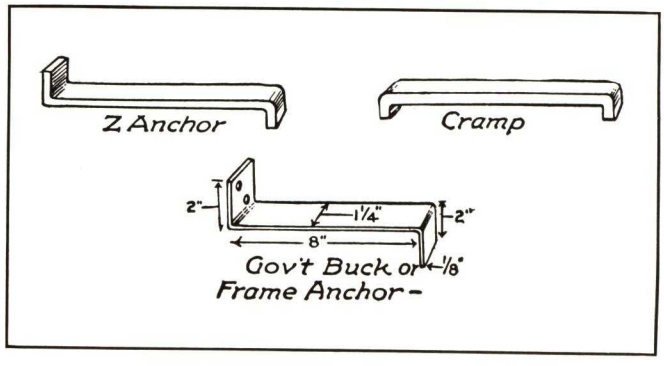
Typical Specification

For anchoring a new wall to an existing wall the contractor shall use Ankortite Wall Anchorage manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo., drilling in the mortar joints of the old wall and inserting lag screws with expansion anchors for holding the metal channel into which anchors shall be keyed for holding the new wall.

ASHLAR ANCHORS

We manufacture Z anchors, cramps and buck anchors in all lengths, widths and thicknesses of metal.
They are furnished plain black, asphalt or red-lead coated; galvanized or cadmium treated for rust protection. When asking for prices please give the following information: Quantity of each size, width and thickness of metal, length between bends, length turned at each end, whether U or Z-shape, and coating, if any.

We also make various other types of anchors used in construction work and will gladly quote prices upon receipt of specifications.

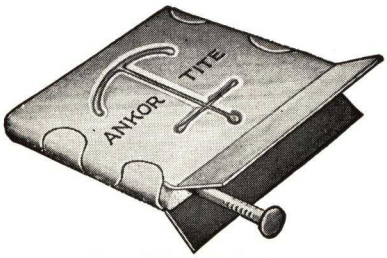


ANKORTITE WALL PLUGS
All Metal and Wood Filled

The all-metal wall plugs are 2¼ in. wide and are made of 24-gauge galvanized metal.

They are made in two sizes, the larger extending into the mortar 2½ in. and the smaller size 1¾ in.

The wood-filled plug has a creosoted wood filler, is 3 in. wide and extends into the mortar 2¼ in.



Wood-Filled Wall Plug

Typical Specification

Nailing Grounds—As nailing grounds for baseboard, chair rails or other wood trim, furnish and install in the mortar line Ankortite All-Metal (Wood-filled) Wall Plugs spaced not farther than .. inches apart, as manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo.

All-Metal Wall Plug

ANKORTITE ADJUSTABLE INSERT
Malleable Iron

(Patented)

Ankortite Inserts are used with either slab concrete ceilings or with beam and girder concrete ceilings. They are nailed into wood forms, notches having been provided in the extended flange on both sides for this purpose. When used with steel forms they can be held in place with small pads of concrete until the remaining concrete is poured.

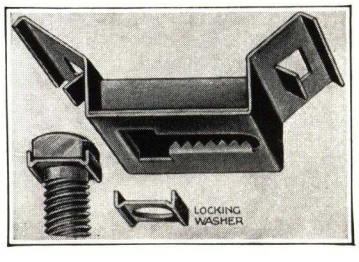
These inserts are a proven necessity in concrete construction for hanging steam or water pipes, sprinkler systems, trolleys, motors, line shafts, etc. By reversing their position they are also used in floors for other anchorage purposes such as for theater and stadium seats, manual training equipment, machinery and other objects, where adjustment to position and solid anchorage to the floor is desired.

Inside the box that holds the bolt head are serrations which mesh with the locking collar on the underneath side of the bolt head preventing any shifting of the bolt from vibration or other causes when the nut is tightened. A full 1½ in. bolt adjustment is obtained as there is a groove in the outer end of the bolt-head opening into which one tooth of the locking collar fits, the other tooth meshing in the first notch on the opposite side of the bolt hole, thereby bridging the bolt-head opening.

In the Ankortite Insert strength is combined with adjustability as in addition to the anchoring arms on top the ledges on both sides of the nailing flange form an additional hold in the concrete.

Locking collars are furnished with the inserts for whatever size of machine bolts to be used. The inserts can also be furnished for ¾ and ⅞-in. machine bolts.

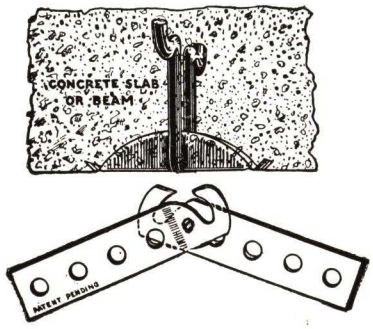
ANKORTITE ADJUSTABLE INSERT
Pressed Steel



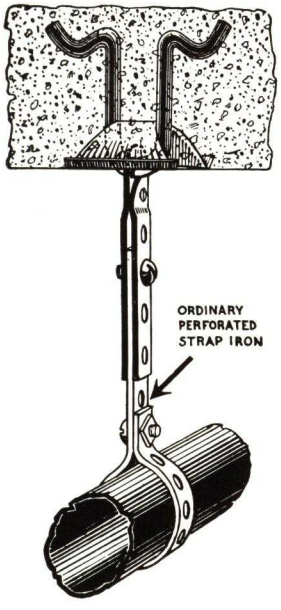
This insert serves the same purpose and in the same way as the one shown above except that it is made of pressed steel and has the anchorage extending outwardly at the ends of the insert instead of directly behind. From the construction of the anchorage wings it will be noted that it has a tremendous anchorage. Cadmium plated for rust protection.

ANKORTITE HANGER INSERTS AND HOOKS

This is a most practical, convenient and economical insert for suspended ceilings, electrical conduit, lighting fixtures or similar objects to be hung from concrete slabs or beams.



The wire loop, made from No. 6 galvanized wire, imbeds in the concrete, the shell providing the opening underneath. Each insert has a pulling resistance of approximately 3300 lbs. If desired, for future exigencies they may be placed in the ceiling slab and then completely concealed by plastering over until such time as they may be desired for use. This is especially desirable in office and loft buildings where partitions and walls have to be changed from time to time.



For use with the inserts for suspending pipes, etc., we manufacture the Ankortite Hanger Hook, a double hook riveted together near one end. It opens to engage the wire loop of the insert and when closed is absolutely locked in place. Perforated straps around the suspended object can then be bolted to them through the holes provided, making it impossible for the hooks to open.

Inserts are sold with or without the hooks.

Typical Specification

In ceiling forms where shown on plans install Ankortite Adjustable (Hanger) Inserts, manufactured by Ankortite Products, Inc., Kansas City, Mo. These inserts shall be spaced on .... ft. centers.

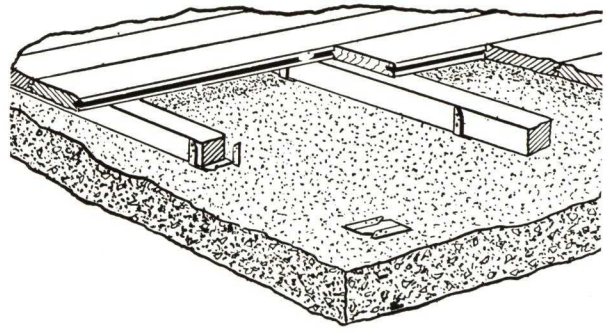
ANKORTITE FLOOR CLIPS

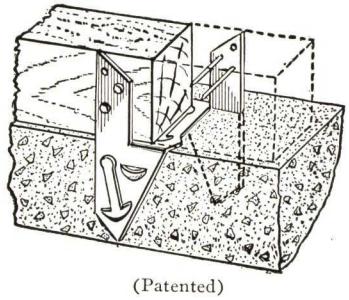
Ankortite Floor Clips produce the most solid wood floor anchorage to concrete slabs at the lowest possible cost. This method of setting the clips in the concrete while it is plastic and subsequently attaching the wood sleepers to them eliminates the cost and weight of a fill between sleepers and provides an air space between them that safeguards the floor from dry rot.

Ankortite clips are designed to meet every requirement of anchorage, strength, practicability and economy. They are made of 18-gauge galvanized metal with an embossed anchor and inverted louvre on each flange that inserts in the concrete to provide a positive anchorage in the concrete. The ends of these flanges are pointed, making them easily and quickly placed.

The clips lie flat on the concrete surface, leaving it free for trucking, stacking, etc., until the floor is to be laid. The tabs that receive the sleepers are then raised, the sleepers placed, leveled and nailed. The nailing tabs have a direct pull against the anchored portion of the clip and are extra long to permit nailing over uneven floor slabs. The generous width of the clip permits sleeper ends to be joined within the clip, while the nails are offset so they do not register opposite each other to weaken the sleeper.

Clips are packed 500 per carton. They are made for 2, 3 and 4-in. sleepers.





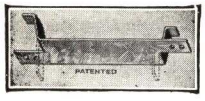
(Patented)

Spaced 16 In. on Centers Each Way. 570 Clips Are Required per 1000 Sq. Ft. of Floor Area

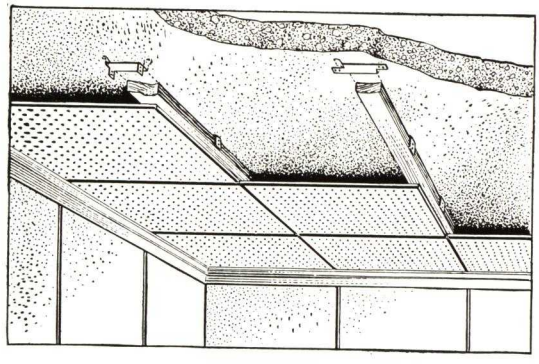
Typical Specification for Sleeper Anchors

Where wood floors occur over concrete slabs they shall be anchored with Ankortite Floor Clips, manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo., and spaced on 16-in. centers.

ANKORTITE ACOUSTICAL CLIP



For anchoring furring strips for attaching acoustical ceilings we have developed a special clip similar to the Ankortite Floor Clip except it is smaller and is placed in the bottom of the ceiling slab or beam forms. When the forms are removed the tabs bend down to receive the furring strips. The clips are only 1 in. wide which permits their use in connection with pan forms. They are made for 1 in., 2 in. or 3 in. widths of strips.

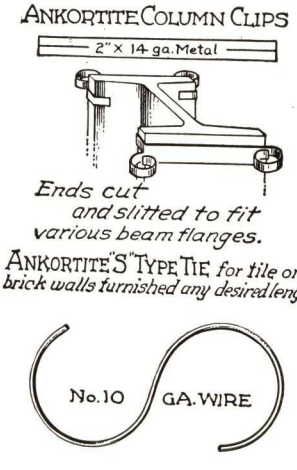


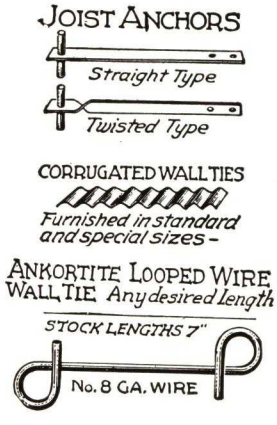
Typical Specifications

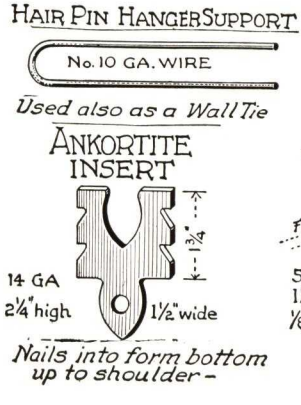
Acoustical Ceilings—Furring strips shall be secured to the ceiling with Ankortite Acoustical Clips of the proper size to accommodate the widths of strips specified.

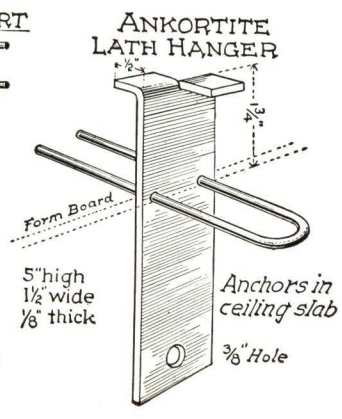
Clips shall be placed in the concrete forms and spaced 16 inches apart in true alignment along each furring strip.

These clips are manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo. and Philadelphia, Pa.

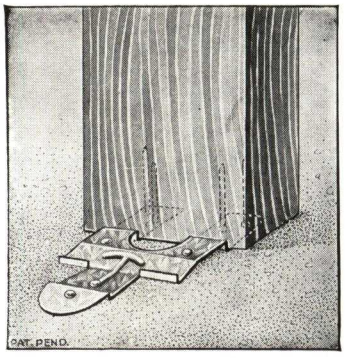








ANKORTITE BUCK ANCHORS

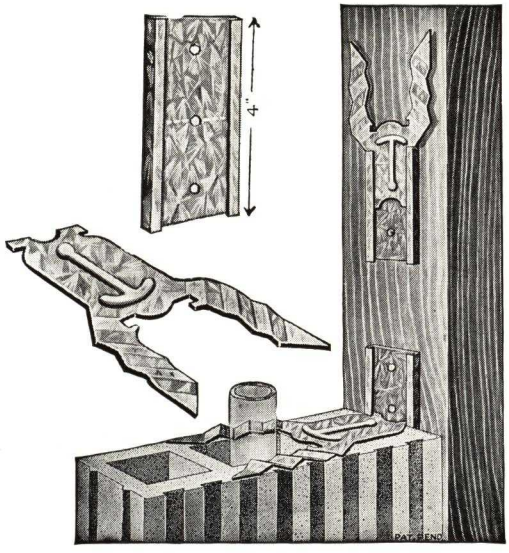


Floor Buck Anchor

The adjustable buck anchor consists of a channel which nails to the buck and an anchor with bifurcated ends that engages it and extends into the mortar line between courses of brick, clay tile or gypsum blocks. Furnishes a positive anchorage and is conveniently in place for the mason.

We also manufacture a short anchor 3½ in. long for use with the channel member, which makes a superior tie for anchoring brick veneer to frame construction. These anchors are placed in the mortar line of every fifth course of brick.

The floor buck anchor is nailed to the bottom of the buck then adjusted to position and nailed to the concrete floor with special nails provided. It is then covered over by the blocks.



Adjustable Buck Anchor

Typical Specification

All wood bucks shall be anchored to partitions or walls with Ankortite Adjustable Buck Anchors manufactured by Ankortite Products, Inc., Kansas City, Mo., using three anchors to each side of the buck properly placed.

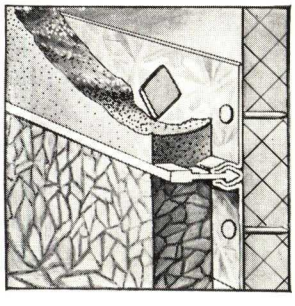
Where wood bucks are to rest on concrete or terrazzo floors they shall be fastened to the floor with Ankortite Floor Buck Anchors nailed to the end of each buck, the other end of the anchor resting in the mortar line of the wall.

ANKORTITE BASE SCREED
For Terrazzo or Concrete Base

Ankortite Base Screed is used between plaster walls and terrazzo, cement or composition base. It can also be used as a protective border in recessed or projecting plaster panels.

The screed consists of a metal strip or bar formed and securely locked its entire length into a specially shaped galvanized base. It can be cut with a hack saw and regardless of where it may be severed there are no loose ends. Its construction makes it extremely rigid and it is perfectly straight, which is of particular advantage in installing. The strip is made of either brass or zinc metal and in two types—flush and projecting.

The screed serves as a gauge for the plaster coat as well as for the base. It makes a permanent separation of the two materials, prevents chemical stains and protects the edges of both materials from chipping or breaking. The screed strip being made of non-corrosive metals cannot rust as does a galvanized screed with the coating fractured at the edge. It eliminates temporary grounds and gives an attractive workmanlike appearance to the job.



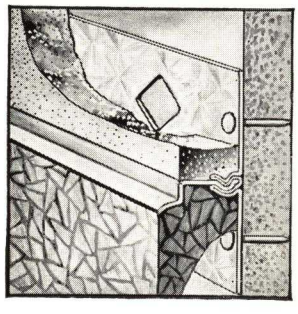
The Flush Type
(Patented)

The flush type is made for either ½, ⅝ or ¾ in. plaster and is furnished in brass or white metal with the exposed edge from 16-gauge (.050 in.) to ¼ in. thick. It is simple and easy to install and is especially recommended where a thick surface is desired for ornamentation.

The Projecting Type

The projecting type has an offset of ¼ in. beyond the plaster line. The offset permits the plasterer to finish off square while the projecting curved surface covers as well as protects the top of the base.

The projecting type is made for ½, ⅝ or ¾-in. plaster and in brass or white metal in 18-gauge (.040-in.) only.



Typical Specification

The plaster contractor shall provide and install between base and plaster parallel to the finished floor a brass (white metal) base screed, flush (projecting) type of.....gauge or thickness, as manufactured by Ankortite Products, Inc., Kansas City, Mo. Corner pieces of same depth as screed shall be installed at all inside and outside corners. Where necessary wedges shall be used behind the nailing flange to establish the screed in a true plane with the plaster.

ANKORTITE TERRAZZO STRIPS AND BARS

The durability and beauty of terrazzo has definitely established it as a major floor material. Its low ultimate cost together with its low maintenance cost, fine appearance and sanitary characteristics, recommends its use in practically every type of public or commercial building as well as for certain residential adaptations.

Available in a multiplicity of colors, shades and patterns, terrazzo is not confined to floors alone but is also successfully used for wall bases and coves, wainscots, partitions, facings, counters, sidewalks, ramps and ornamental units.

In the design and manufacture of the products shown herein we are contributing not only to an improved and more economical installation but one that enhances the beauty, utility and serviceability of this type of floors.

ANKORTITE DIVIDING STRIPS

(Patented)

Rigid-Rib Type No. 6

The stiffening rib through the center of the strip gives the Rigid-Rib type unusual rigidity, which is especially advantageous in the lighter gauges for easy setting and alignment. It also increases the anchorage afforded by the oblong lugged-out locking holes. This design is furnished in 18 and 20 gauge.

Double-Lock Type No. 7

In the Double-Lock type the twin anchoring lugs are spaced on 4½-in. centers and give a tremendous anchorage as well as hold the strips firmly upright in the underbed. This design is particularly recommended for the heavier strips 16-gauge and thicker, which are sufficiently rigid without the stiffening rib, but can also be furnished in the lighter gauges.

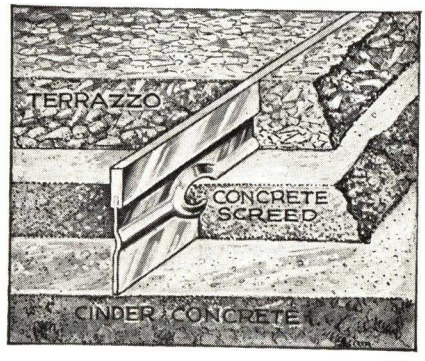
Both types of strips are flat on one side so they can be set with a straight edge. They are furnished in brass or white metal in 6-ft. lengths and in all common depths. Brown & Sharp Gauge used as basis of measuring thickness on both brass and white zinc alloy.

Typical Specification

Dividing Strips—Where terrazzo floors are shown install in the cement screed underbed Ankortite Brass (White Metal) Rigid-Rib (Double-Lock) Dividing Strips .... gauge by .... in. as manufactured by Ankortite Products, Inc., Kansas City, Mo.

ANKORTITE STANDARD HEAVY TOP BARS

(Patent Pending)



This bar is produced by a modern method of uniting a 20-gauge anchoring base to a top bar ⅜ in. deep and ⅛, $\frac{3}{16}$, or ¼ in. wide. The joining process is continuous throughout the length of the bar and there is no separation at the ends regardless of where they may be cut. Likewise, no edgewise curvature can occur when setting or tapping the bars into the underbed as the top cannot become separated from the bottom member.

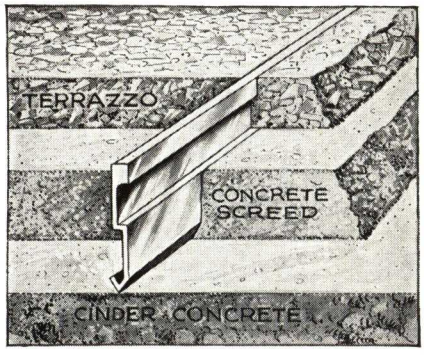
The bars are made of either brass, zinc or nickel silver with either the Rigid-Rib or Double-Lock design in the base. With the Rigid-Rib design, cross strips may be joined at any point on either side without slicing. Brass bars with zinc base can be furnished if desired. Stocked in 1 and 1¼-in. over-all depths.

Typical Specification

Dividing Bars—Install in the cement screed underbed while still in a plastic state Ankortite Standard Heavy Top Brass (Zinc) Dividing Bars. The top surface shall be ⅛ in. ($\frac{3}{16}$ or ¼ in.) wide and the over-all depth 1 in. (1¼ in). These bars are manufactured and marketed by Ankortite Products, Inc., Kansas City, Mo.

ANKORTITE ONE-PIECE HEAVY TOP DIVIDING BARS

(Patented)



Type No. 1

The Ankortite Heavy Top Dividing Bar in one piece is a new development in the terrazzo strip field and presents several exclusive advantages over the method of fastening a thin flange to a heavy top.

Being one piece, there is no possibility of the top becoming loose or detached from the anchored member when it is tapped into the concrete and no separated ends when cut. The pointed flange centers, and is balanced with, the heavy top permitting the bar to be readily inserted in the concrete with no tendency to side-shift. The V-shaped hook on the bottom edge, being continuous, gives the bar greater anchorage in the screed underbed of bars having perforations at intervals, while the ledge offset in the center anchors it also in the terrazzo, as well as serving as a depth gauge for the terrazzo coat. It may be set without a straight edge and cross-filler strips will join at any point on both sides without slicing. The bar can be curved to any required radius.

As there are no perforations through which the floor mixtures may flow it is a true dividing bar in every sense of the word.

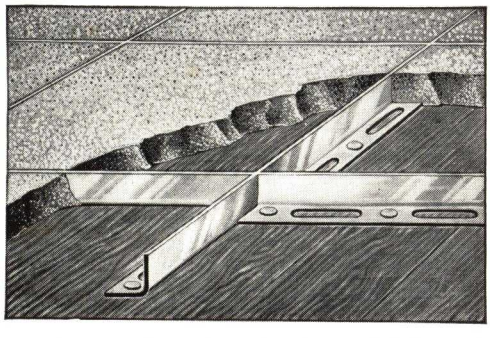
While the price is somewhat higher than for the assembled bars, the slight additional cost is largely offset by the labor saving in setting.

This type bar is made of brass with the top ⅛, $\frac{3}{16}$ and ¼ in. wide and depths of 1 and 1¼ in. Also in coated aluminum ⅛ x 1¼ in.

Typical Specification

Dividing Bars—Install in the cement screed underbed while still in a plastic state Ankortite Brass One-Piece, Heavy Top Dividing Bars with continuous V-shaped anchorage as manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo. These Bars to be ⅛, $\frac{3}{16}$, or ¼ in. thick (specify which) with an over-all depth of 1 or 1¼ in.

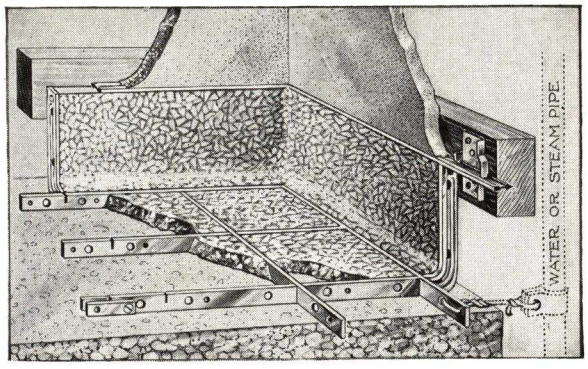
ANGLE STRIPS



These strips are practical as dividers for magnesite, granolithic and similar types of floors. They are furnished in all common gauges of brass and zinc and can also be supplied with heavy tops ⅛, $\frac{3}{16}$ or ¼ in. wide.

ANKORTITE METALIZED GRILLES

For Hospital Operating Room Floors



To guard against the possibility of a static spark igniting the vapor of anæsthetizing gas in operating rooms the terrazzo or composition floor is installed with a system of metal grilles made into 6-in. squares all connected to make an electrical contact of the entire unit, the whole being grounded with copper wire to a suitable conductor, such as a water or steam pipe. These grilles are ordinarily made of ⅛ x ¾ in. brass or zinc alloy, holed for suitable anchorage in the terrazzo and shipped in sections of approximately 3 x 3 ft., which are joined together on the job. Where the strips intersect each is notched ⅜ in. and the joint soldered. Sections are joined together by small fish plates screw-bolted to each side of the strips. This type of metalized floors has been widely used in Government and other modern hospital construction.

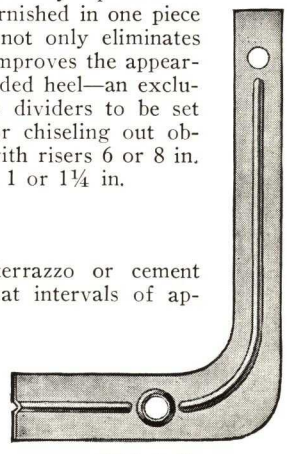
Typical Specification

In operating rooms as indicated on plans the terrazzo field shall be divided with brass (white metal) floor grilles as manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo., of ⅛ x ¾ in. metal, made up in sections composed of 6-in. squares and slotted to a depth of ⅜ in. where strips intersect, and the joints soldered. Sections shall be joined together by metal fish plates ⅜ x 1½ x $\frac{3}{32}$-in. screw bolted to each side of the strips. In each room and corridor near the four corners approved bare copper conductor wires of No. 6 B. & S. gauge shall be soldered to floor dividers, passed through perforations in the structural slab and properly connected to water pipes with approved ground clamps.

ANKORTITE COVE BASE DIVIDERS

Cove base dividers are set in terrazzo base for the same purpose that strips are used in the floors and also to carry out the floor scheme. They are made, therefore, in all gauges of brass and white metal from 20 to 12 and also with the face ⅛, $\frac{3}{16}$ or ¼ in. to correspond to the heavy top bars.

Ankortite base dividers can be furnished in one piece with toes up to 9 in. long, which not only eliminates setting a divider and extension but improves the appearance of the finished floor. The rounded heel—an exclusive Ankortite feature—permits the dividers to be set without cutting away that corner or chiseling out obstructions in the angle. Furnished with risers 6 or 8 in. high, radius 1 or 1½ in., toe depths 1 or 1¼ in.



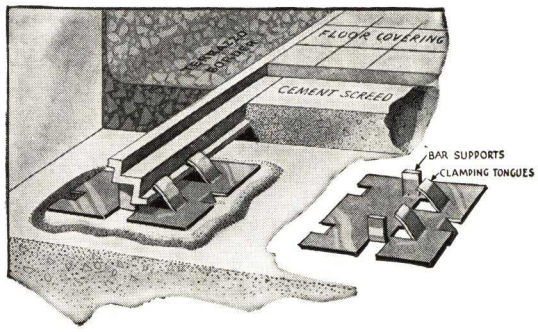
(Patented)

Typical Specification

Cove Base Dividers—Where terrazzo or cement base is shown it shall be divided at intervals of approximately 4 ft. with Ankortite Cove Base Dividers of the same metal and thickness as used in the floor. They shall have a radius of 1 in. (1½ in.) These dividers are manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo.

ANKORTITE RECESSED FLOOR BARS

(Patent No. 1,675,313)



An anchored bar extensively used where an offset is provided for linoleum or other applied floor covering where it joins concrete, terrazzo or other materials as in hospitals, libraries, schools, churches and other public buildings. It has an exposed wearing surface of $\frac{3}{16}$ in. and being a multiple-angle bar is very rigid and strong.

The bar is set out a few inches from the wall, meeting a square or cove base on the one side and providing the offset for the applied covering on the other. This makes a perfect joint of the two materials with no opportunity for the collection of dirt or germs and at the same time gives an ornamental border for the finished floor.

The base anchors are usually spaced on approximately 18-in. centers but are slidable along the bar and may be placed as desired. The anchors are attached to the bars and placed on pads of concrete dropped on the floor slab. The bars are then leveled to any desired floor height. The horizontal base anchors permit the bars to be easily adjusted sidewise in obtaining alignment, a distinct advantage over bars with vertical anchorage. When the concrete has hardened the terrazzo base and inside fill are put in.

The Recessed Floor Bar is made of extruded brass and hardened white metal with the offset to accommodate $\frac{1}{8}$ in., $\frac{3}{16}$ in., 6 mm. or $\frac{1}{4}$-in. floor covering. Stock lengths, 8 ft.

Uses and Advantages

The uses and advantages of the Ankortite Recessed Floor Bar may be summed up briefly as follows:

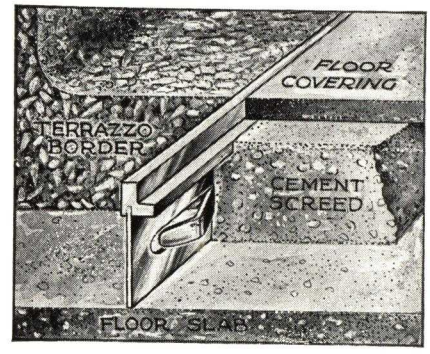
1. The bar forms the offset for receiving the applied floor covering.
2. It makes a close, perfect abutment of the two floor materials on the same level, with an ornamental brass or white metal ouline in evidence.
3. Gives a straight binding edge for cutting and fitting the applied covering.
4. Makes a smooth, level base for the covering that brings its surface even with the top of the bar and outside border.
5. Protects the border material against crumbling or chipping.
6. Top of bar serves as a screed for finishing border material to proper level.
7. Shoulder of bar is also a screed for striking off the inside fill.
8. Serves also as a dividing bar between the two fills, preventing cracks from the inside field extending into the border material.
9. The cement screed may be any specified thickness as the depth of bar and anchor is only $\frac{3}{4}$ in.

Typical Specification

Recessed Floor Binding Bars—At edges of terrazzo (or cement) borders joining linoleum (or rubber tile) floors, set Ankortite Recessed Brass (White Metal) Floor Bars with horizontal base anchors spaced on 18-in. centers. Finish outside border flush with top of bar and cement screed flush with shoulder of bar. These bars are made and marketed by ANKORTITE PRODUCTS, INC., Kansas City, Mo.

ANKORTITE LINOLEUM BAR

(Patent Pending)



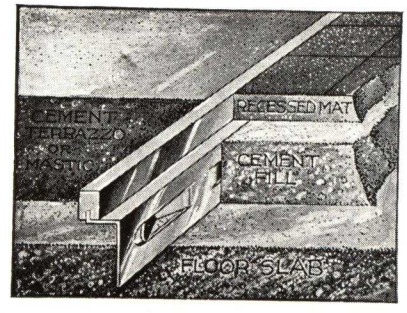
This bar is similar in its usage to the recessed floor bar for joining terrazzo and applied floor covering except that it has a vertical anchoring base joined continuously to the top member. The top is $\frac{5}{32}$ in. wide and the shelf offset accommodates floor covering of all standard thicknesses. The Double-Lock design in the base with the anchors underneath the shelf balance the bar for easy setting. Furnished in brass or zinc alloy in over-all depths of $\frac{3}{4}$ in. to $1\frac{1}{2}$ in.

Typical Specification

Linoleum Binding Bars—At edges of terrazzo (or cement) borders joining linoleum (or other composition) floors set Ankortite brass (or white metal) Linoleum Bars as manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo. Bars shall have a top width of $\frac{1}{8}$ in. ($\frac{3}{16}$ or $\frac{1}{4}$ in.) with the shelf the same as the thickness of the composition flooring and an over-all depth of .... in.

ANKORTITE OFFSET BAR

For Recessed Floor Mats



This bar is similar in purpose to the linoleum bar but its design permits the usage of the exposed top from $\frac{1}{8}$ to $\frac{1}{2}$ in. wide and also variable depths of offset from $\frac{1}{8}$ to $\frac{5}{8}$ in. It is especially adapted for recessed mats of rubber, leather or thick cork at entrance vestibules, elevator landings and in corridors where an exposed surface of more than $\frac{1}{8}$ in. width or an offset of more than $\frac{1}{4}$ in. depth is desired.

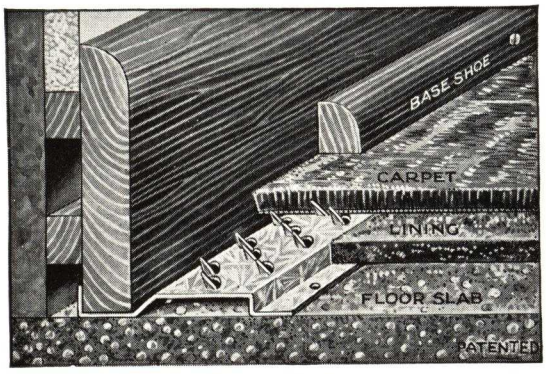
The bar is made in over-all depths of 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 in. in brass or white metal.

Typical Specification

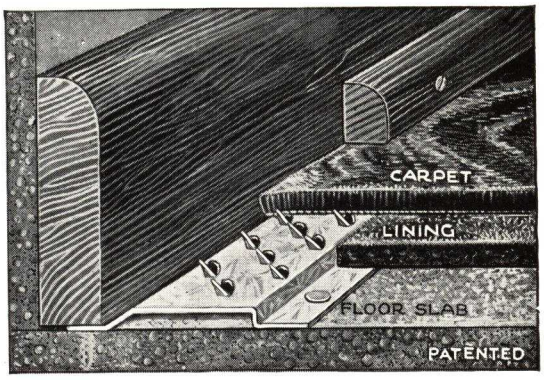
Around mat recesses in (state where located) furnish and install Ankortite Offset Bars as manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo., same to have an exposed top surface .... in. wide, a recess .... in. deep and an over-all depth of .... in.

FLOOR AND WALL MATERIALS

TACKLESS CARPET STRIP



Design No. 1
For installing at the same time as the baseboard



Design No. 2
For use where baseboard is already attached

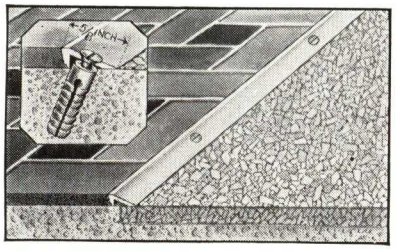
The growing use of carpets over concrete floors created a problem of fastening them. The Tackless Carpet Strip solves it in an admirable manner. The strip fits under the baseboard and is secured to the floor with concrete nails. The teeth in the strip engage the carpet from the underneath side and hold it securely, while the base shoe completes the installation. Elimination of tacks gives a perfectly smooth, sanitary carpet finish.

Typical Specification

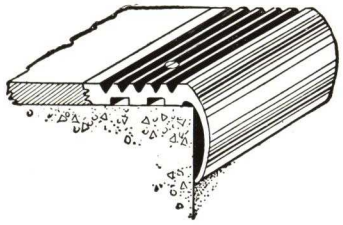
In all rooms and corridors to be carpeted from wall to wall provide and install the Metal Tackless Carpet Strip as manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo. The base of the teeth on the strip shall be the same height as the thickness of the carpet lining.

NOSINGS AND BINDERS

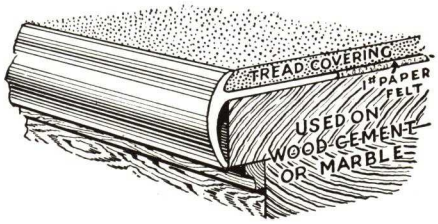
Furnished in Polished Finish or Satin Finish



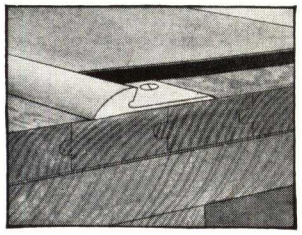
No. 300 Beveled Brass Binding Strip



No. 100 Grooved Stair Nosing



No. 50 Plain Stair Nosing



No. 600 Floor Edging

No. 300—Brass only, for ⅛, $\frac{3}{16}$ and ¼-in. coverings.

No. 200—Brass only, for $\frac{3}{16}$ and ¼-in. coverings. The $\frac{3}{16}$ in. height is 1 in. wide and the ¼ in. height is 1¼ in. wide.

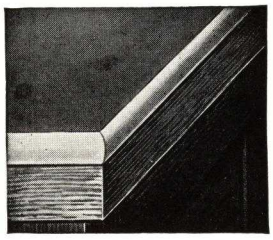
No. 400—Brass only, 1 and 2-in. widths.

No. 50—Brass or White Metal for $\frac{3}{32}$, ⅛, ¾ and ¼-in. coverings.

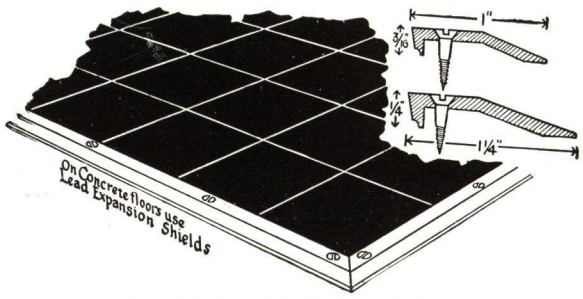
No. 100—Brass or White Metal in 1¼-in. flange for $\frac{3}{16}$ and ¼-in. coverings. Brass only in 2-in. flange for $\frac{3}{16}$ and ¼-in. coverings.

No. 600—Brass or White Metal for $\frac{3}{32}$, ⅛, $\frac{3}{16}$ or ¼-in. coverings.

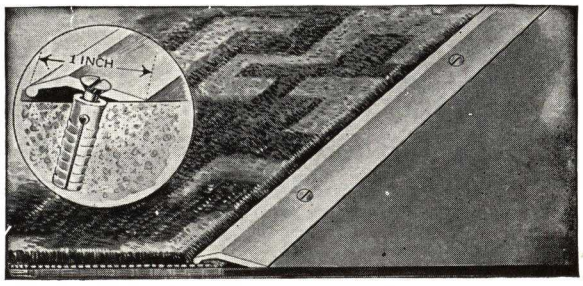
No. 500—Brass for $\frac{3}{16}$ and ¼-in. coverings. White Metal for $\frac{3}{32}$, ⅛, $\frac{3}{16}$ and ¼-in. coverings.



No. 500 Desk Edging



No. 200 Beveled Brass Binding Strip

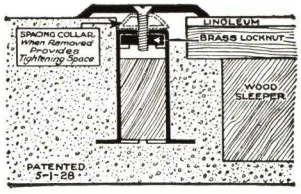


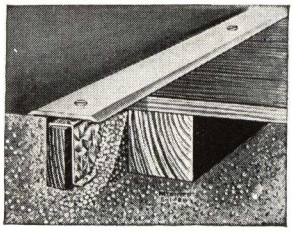
No. 400 Carpet Binder Bar

ANKORTITE FLOOR JOINERS

For Joining Abutting Floors of Different Materials

The Ankortite Floor Joiner is not merely a threshold but consists of a threshold or cover plate attached to a base assembly with a tightening space between to take up the looseness that occurs as floors settle, shrink or wear, thereby assuring a tight and rattle-proof floor joint connection throughout the life of the building. The cross-section drawing shows its construction—the brass lock nut into which the screws fasten; temporary spacing collar and the provision for screw travel in tightening the cover plate. The metal base assemblies are mounted on a wood strip for spacing only during the setting process. Standard cover plates are 2¼ or 3 in. wide, arched or flat and in brass, architectural bronze or white metal. Regular 4, 5 and 6-in. plain or grooved threshold plates can also be supplied on the Ankortite base.



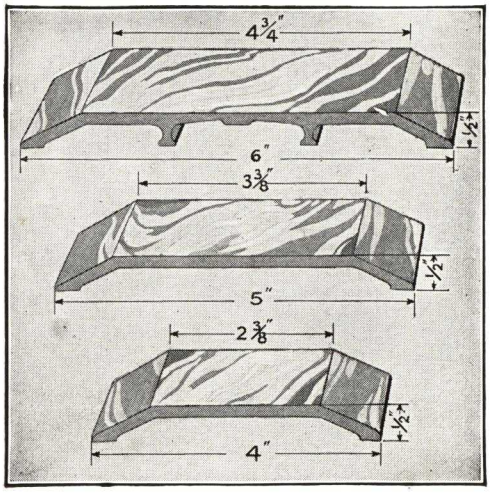


Ankortite Floor Joiner Assembled
Ankortite Floor Joiners are made to the lengths specified, assembled and ready to be placed. Simple installation instructions accompany each shipment

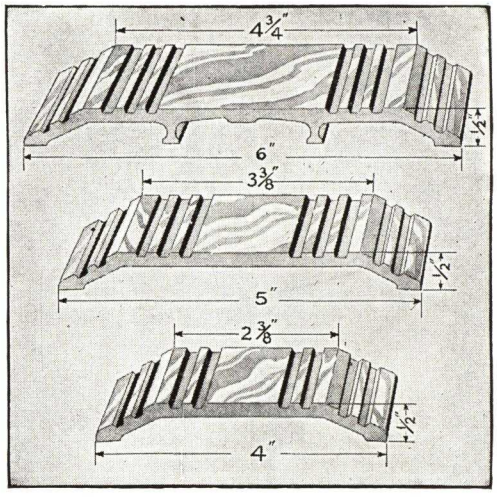
Typical Specification for Floor Joint Connections

Wherever floors of different materials adjoin, furnish and install according to manufacturer's directions Ankortite Floor Joiners with cover plates of brass (architectural bronze or white metal) arched (flat) type .. in. in width. These joiners are manufactured by ANKORTITE PRODUCTS, INC., Kansas City, Mo.

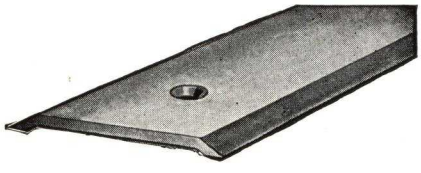
ANKORTITE THRESHOLDS



Plain Thresholds—Brass Only

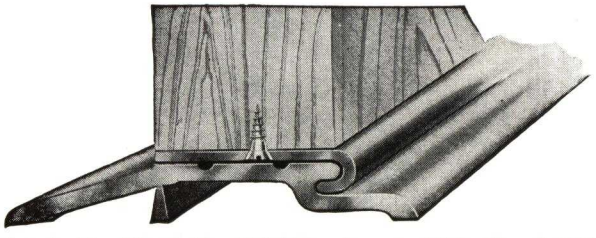


Grooved Thresholds—Brass or White



No. 800 Beveled Floor Plate
2¼" and 3" wide. Brass or White

No. 801 Grooved Floor Plate
1½" Wide. Brass Only



Interlocking Threshold. ⅝" high. Brass in 3½", 4" and 4¼" Widths. White in 4" Width Only

No. 802 Parting Strip
Wide. Brass or White

No. 803 Grooved Binder Bar
1¼" Wide. Brass Only

MOGUL CORPORATION

Mogul Inserts—D-B Form Spacers—Mogul Floor Clips

1403 West 26th Street
MINNEAPOLIS, MINN.

MOGUL ADJUSTABLE CONCRETE INSERTS

For Anchoring Shelf Angles, Lintels and Other Attachments to Beams and Columns

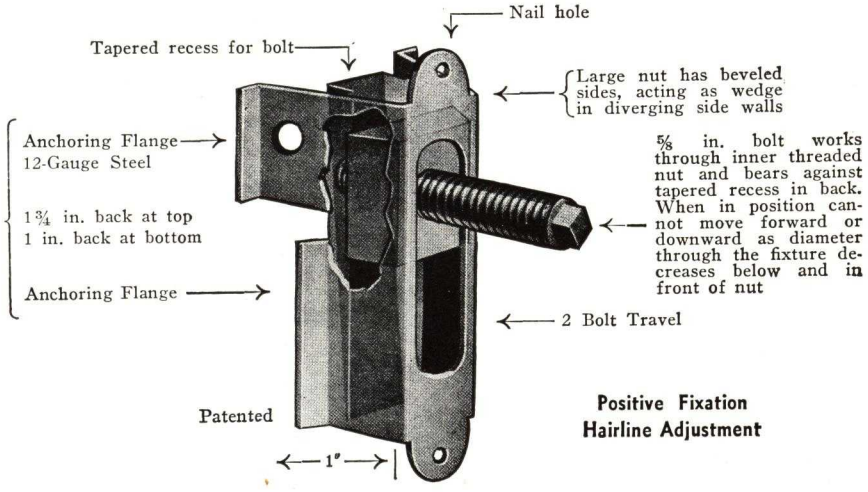
The Mogul Insert is an adjustable holder for shelf angle bolts. It provides a 2 in. vertical adjustment for the bolt, with permanent anchorage at any point desired. The position of the bolt can be adjusted to a hairline. The slotted holes in the angles provide lateral adjustment.

Thus, the Mogul Insert obviates the necessity of enlarging holes in the angles to receive misplaced bolts cast in the concrete, avoids trouble of locating bolts in the form and boring holes, eliminates cutting of masonry to fit a fixed angle previously attached, and facilitates lowering of material to workmen as no bolts protrude from the building.

Mogul Adjustable Inserts provide maximum strength and double security against failure. The wing sections are made of 12-gauge steel with diverging sidewalls. The large inner nut is beveled to fit the walls, thus providing a wedge action in the concrete by both the fixture and the nut. Concrete displacement is negligible, the contents of the box being only 3½ cu. in.

The face of every fixture is sealed watertight at the factory, and seal is not broken until the bolt is inserted. This insures a dry, clean interior. No concrete can enter.

The cost of Mogul Inserts installed is less than ordinary bolts, and they are far more satisfactory.



Specification

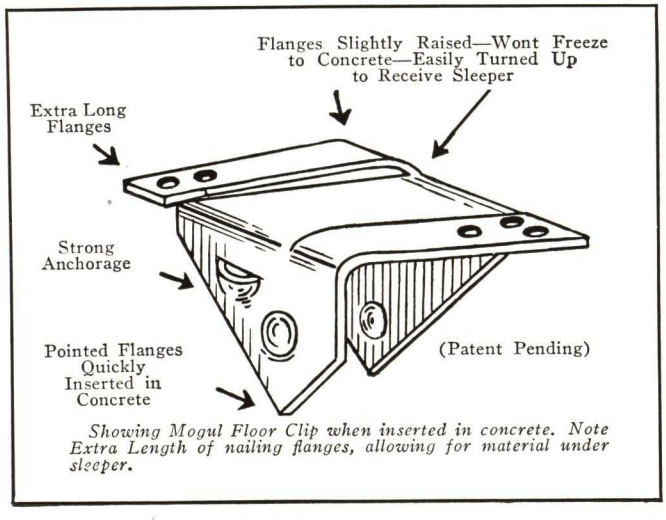
For anchoring shelf angles and lintels, install Mogul Shelf Angle Fixtures as manufactured by the MOGUL CORPORATION, Minneapolis, Minnesota. Fixtures shall be provided with a ⅝-in. bolt and shall have 2-in. vertical adjustment with fixation of bolt at any point, shall be coated with standard rustproof material, and shall be spaced on 30-in. centers.

MOGUL FLOOR CLIP FOR BETTER FLOOR CONSTRUCTION

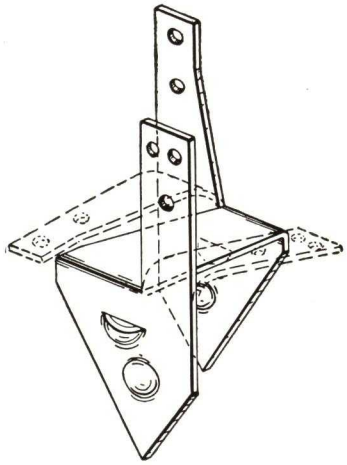
The Mogul Floor Clip eliminates concrete fill between sleepers which can be placed in one-half the time required when a fill is used. Avoids delay in waiting for fill to dry. Reduces dead weight 18,000 lbs. per 1000 sq. ft. floor space, resulting in an additional saving of 6c per sq. ft. Pipes and conduits can be placed on top of slab and under the floor. Dry air spaces prevent rotting and prolong the life of the floor.

Mogul Floor Clips are scientifically designed to provide every advantage lacking in other floor clips.

The pointed flanges that insert in the concrete are easily and quickly placed. These flanges are embossed and have inverted louvres, providing strong anchorage in slab. Nailing flanges do not freeze to concrete while it is drying. They are more easily raised into vertical position to receive sleeper. These nailing flanges are extra long, to accommodate a layer of material under sleeper, if desired. Nails do not register opposite each other to weaken sleeper, as nailing flanges are offset. Ends of sleepers can be joined within the clip. The Mogul is rustproofed after forming, leaving no raw edges to corrode. Made for 2, 3, and 4-in. sleepers Packed 500 clips per carton.



Showing Mogul Floor Clip when inserted in concrete. Note Extra Length of nailing flanges, allowing for material under sleeper.



After concrete is dry, nailing flanges are turned upward to receive sleeper. These flanges are offset. Nails do not register opposite each other to weaken sleepers. Ends of sleepers can be joined within clip.

Specifications

Where wood floors occur over concrete slabs, the sleepers shall be anchored to the concrete with Mogul Floor Clips manufactured by MOGUL CORPORATION, Minneapolis, Minn. Clips shall be rustproofed after they are formed, shall be spaced on 16-in. centers along sleeper course and sleepers laid in accordance with manufacturer's directions.

AUTOMATIC NUT CO., INC.

"Structural Rib Bolts" Used with "Anco-Nuts"
More Economical Than Riveting

LEBANON, PA.

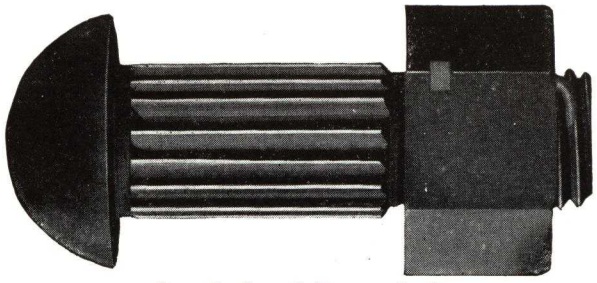
The Manufacturer

The AUTOMATIC NUT CO., INC., has earned an enviable reputation for reliability and high quality of materials. Careful manufacturing control is maintained, so that the user of "Structural Rib Bolts" with Anco-Nuts is assured of a uniform product of dimensional accuracy. The company is equipped to handle the largest orders promptly.

Why a Substitute for Riveting Is Needed

Riveting is expensive—both for material and labor, as well as for additional equipment, such as for heating, etc. Noise of riveting hammers is always objectionable (especially in hospital zones), and in some steel structures it is difficult to use a riveting hammer at all. Condemned rivets have to be replaced, and this is costly.

THE "STRUCTURAL RIB BOLT"



Practical and Economical

The "Structural Rib Bolt" used with the Anco-Nut (see next page) is a practical substitute for riveting. The only equipment necessary for erection is a hand hammer and a wrench. Savings result from lower cost of material, labor and time. Time is saved on erection as well as dismantling, especially when erecting in the field. No heating or riveting equipment needed. Unskilled labor can be used. The high cost of dismantling is eliminated as the Anco-Nut locks and unlocks with an ordinary wrench.

Architectural Uses

More and more architects are specifying "Structural Rib Bolts" with "Anco-Nuts" for forms of structural construction where speed, economy and other advantages listed above are desired.

Building Code Approval

Structural Rib Bolts, equipped with Automatic Lock Nuts, were approved for use in place of rivets by a number of Building Code Authorities in the erection of different types of construction during the years 1937 and 1938 in 31 States of the Union and several Foreign Countries, basing their approval on the results of tests made by Robert W. Hunt Co. and The University of Wisconsin.

Description

The head of the "Structural Rib Bolt" is standard American Boiler Makers' Association button type. The important feature of this bolt lies in the longitudinal ribs shown above. The bolt is driven into the hole in the work with an ordinary hand hammer. In doing this, the triangular shaped ribs embed themselves and mush into the plates, thereby locking the bolt into position, but these ribs will not project beyond the thickness of the plates if proper specifications are given when ordering.

If necessary to remove the bolt, it can be driven out of the hole without difficulty, and without damage to edges of hole in the work. The bolt is made entirely of carbon manganese steel, galvanized or black, and has a minimum tensile strength of 70,000 lbs. per sq. in.

The steps in the design of any type of jointed construction in which "Structural Rib Bolts" are to be used are the same as for riveted joints, as follows:

(1) Selection of size of bolt to be used.

(2) Determination of its shearing and bearing strength and use of the smaller value of the two to divide into total load to be transmitted, and thus determine number of bolts.

(3) Arrangement of bolts in the plate and the investigation of its strength in tension at the dangerous section.

Stronger Than Rivets

COMPARISON OF "STRUCTURAL RIB BOLT" WITH STRUCTURAL RIVET

Size	5/8 in.		3/4 in.		7/8 in.		1 in.	
	S. R. B.	Rivet	S. R. B.	Rivet	S. R. B.	Rivet	S. R. B.	Rivet
Comparative area, sq. in.	.346	.306	.475	.442	.623	.601	.814	.785
Comparative Tensile strength lbs. per sq. in.	70,000 min.	52,000 to 62,000	70,000 min.	52,000 to 62,000	70,000 min.	52,000 to 62,000	70,000 min.	52,000 to 62,000

SHEAR AND BEARING VALUES OF "STRUCTURAL RIB BOLTS"

Based on Actual Minimum of 70,000 lbs. per sq. in. Tensile

Size	5/8 in.		3/4 in.		7/8 in.		1 in.	
Diameter, in.	.664		.778		.892		1.018	
Area, sq. in.	.346		.475		.623		.814	
Single shear*, lbs.	18,106		25,000		32,800		42,800	
Double shear*, lbs.	36,200		50,000		65,600		85,600	
Thickness of Plate	Bearing value for		Bearing value for		Bearing value for		Bearing value for	
	Single Shear†	Double Shear††	Single Shear†	Double Shear††	Single Shear†	Double Shear††	Single Shear†	Double, Shear††
.125 — 1/8	2620	3190	3070	3750	.....	.....	.....	.....
.1875— 3/16	3920	4790	4600	5620	5270	6440	.....	.....
.250 — 1/4	5240	6390	6120	7500	7030	8580	8020	9800
.3125— 5/16	6550	7190	7660	9360	8780	10730	10020	12250
.375 — 3/8	7850	9570	9200	11200	10520	12800	12030	14700
.437 — 7/16	9150	11200	10750	13100	12300	15000	14030	17150
.500 — 1/2	10500	12800	12250	15000	14050	17150	16030	19600
.5625— 9/16	11700	14400	13780	16870	15800	19320	18050	22050
.625 — 5/8	13100	15900	15320	18720	17560	21400	20040	24490
.6875—11/16	.....	.....	.....	.....	19320	23630	22050	26950
.750 — 3/4	.....	.....	.....	.....	21070	25780	24050	29390

*Shear Value=75% of Tensile
†Single Shear Bearing=45% of Tensile
††Double Shear Bearing=55% of Tensile

Data on the "Structural Rib Bolt"

Head—Standard American Boiler Makers' Association Button Head.

Rib—The Triangular Shaped Ribs embed themselves in the wall of the hole in the work.

Specifications—Carbon Manganese Steel. Minimum tensile strength. 70,000 lbs. per sq. in.

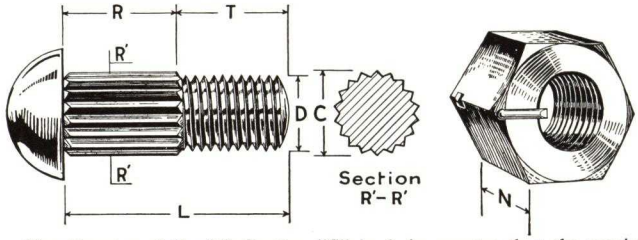
Furnished—Galvanized or black.

Threads—U. S. Standard No. 2 fit.

Notes—Ribs will not project beyond thickness of the plates if proper specifications are given when ordering.

Spacing is the same as for rivets. Drive the "Rib Bolt" through the hole with hand hammer or sledge and draw the nut tight with structural wrench.

"Structural Rib Bolts" Are Made in All Sizes



The diameter of the Rib Section "C" is $\frac{3}{32}$ in. greater than the nominal diameter of the Structural Bolt "D", and $\frac{1}{32}$ in. larger than the size of the hole size in the work.

STANDARD DIMENSIONS

Size, Bolt Diameter "D"		3/8 in.	1/2 in.	5/8 in.	3/4 in.	7/8 in.	1 in.
Hole size		7/16	9/16	11/16	13/16	15/16	1 1/16
Outside diam. of ribs "C"		13/32	19/32	23/32	27/32	31/32	1 3/32
Thickness of work, in.	Lgth. Rib "R", in.	Over-all length "L", inches					
5/16 and 3/8	11/32	15/16	1 1/16	1 3/16	.....	.....	.....
7/16 and 1/2	15/32	1 1/16	1 3/16	1 5/16	1 1/2	1 5/8	.....
9/16 and 5/8	19/32	1 3/16	1 5/16	1 7/16	1 5/8	1 3/4	.....
11/16 and 3/4	23/32	1 5/16	1 7/16	1 9/16	1 3/4	1 7/8	.....
13/16 and 7/8	27/32	1 7/16	1 9/16	1 11/16	1 7/8	2	2 1/8
15/16 and 1	31/32	1 9/16	1 11/16	1 13/16	2	2 1/8	2 1/4
1 1/16 and 1 1/8	1 3/32	1 11/16	1 13/16	1 15/16	2 1/8	2 1/4	2 3/8
1 3/16 and 1 1/4	1 7/32	1 13/16	1 15/16	2 1/16	2 1/4	2 3/8	2 1/2
1 5/16 and 1 3/8	1 11/32	1 15/16	2 1/16	2 3/16	2 3/8	2 1/2	2 5/8
1 7/16 and 1 1/2	1 15/32	2 1/16	2 3/16	2 5/16	2 1/2	2 5/8	2 3/4
1 9/16 and 1 5/8	1 19/32	2 3/16	2 5/16	2 7/16	2 5/8	2 3/4	2 7/8
1 11/16 and 1 3/4	1 23/32	.....	.....	2 9/16	2 3/4	2 7/8	3
1 13/16 and 1 7/8	1 27/32	.....	.....	2 11/16	2 7/8	3	3 1/8
1 15/16 and 2	1 31/32	.....	.....	2 13/16	3	3 1/8	3 1/4
2 1/16 and 2 1/8	2 3/32	.....	.....	2 15/16	3 1/8	3 1/4	3 3/8
2 3/16 and 2 1/4	2 7/32	.....	.....	3 1/16	3 1/4	3 3/8	3 1/2
2 5/16 and 2 3/8	2 11/32	.....	.....	3 3/16	3 3/8	3 1/2	3 5/8
2 7/16 and 2 1/2	2 15/32	.....	.....	3 5/16	3 1/2	3 5/8	3 3/4
2 9/16 and 2 5/8	2 19/32	.....	.....	3 7/16	3 5/8	3 3/4	3 7/8
2 11/16 and 2 3/4	2 23/32	.....	.....	3 9/16	3 3/4	3 7/8	4
2 13/16 and 2 7/8	2 27/32	.....	.....	3 11/16	3 7/8	4	4 1/8
2 15/16 and 3	2 31/32	.....	.....	3 13/16	4	4 1/8	4 1/4
3 1/16 and 3 1/8	3 3/32	.....	.....	3 15/16	4 1/8	4 1/4	4 3/8
3 3/16 and 3 1/4	3 7/32	.....	.....	4 1/16	4 1/4	4 3/8	4 1/2
3 5/16 and 3 3/8	3 11/32	.....	.....	4 3/16	4 3/8	4 1/2	4 5/8
3 7/16 and 3 1/2	3 15/32	.....	.....	4 5/16	4 1/2	4 5/8	4 3/4
3 9/16 and 3 5/8	3 19/32	.....	.....	4 7/16	4 5/8	4 3/4	4 7/8
3 11/16 and 3 3/4	3 23/32	.....	.....	4 9/16	4 3/4	4 7/8	5
3 13/16 and 3 7/8	3 27/32	.....	.....	4 11/16	4 7/8	5	5 1/8
3 15/16 and 4	3 31/32	.....	.....	4 13/16	5	5 1/8	5 1/4
4 1/16 and 4 1/8	4 3/32	.....	.....	4 15/16	5 1/8	5 1/4	5 3/8
Thickness of nut "N", in.		3/8	1/2	5/8	3/4	7/8	1
Nut, across flats, in.		1 1/16	7/8	1 1/16	1 1/4	1 7/16	1 5/8

"Structural Rib Bolts" can also be furnished in 1/4, 5/16, 1 1/8 1 1/4, 1 1/2 in. diameters for any thickness of work.

When Ordering Give Thickness of Work and Diameter of Bolt

In ordering, use care in giving exact thickness of work and punching proper size hole in work for diameter of bolt to be used. The hole size for "Structural Rib Bolts" is the same as for rivets. See table above for size to order.

Specifications

Note to Architects: The following specifications (or similar) should be inserted in the specifications for the erection of Structural Steel. Suitable specification clauses should also be inserted in other portions of the specifications wherever "Structural Rib Bolts" and "Anco-Nuts" are to be used in place of riveting or ordinary bolts and nuts.

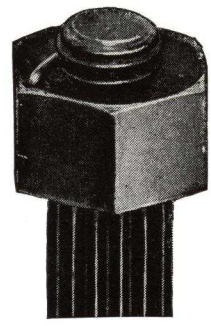
All connections shall be made with "Structural Rib Bolts" and "Anco-Nuts" as manufactured by Automatic Nut Co., Inc., Lebanon, Pa. Diameter of the bolts shall be identical as for rivets; the length shall be such that the ribs shall not project beyond the thickness of the plates. These bolts and nuts shall conform in materials and manufacture to the specifications of the manufacturers contained in their catalog in 1939 Sweet's Catalog File for the Building Industry.

Before inserting "Structural Rib Bolts" and "Anco-Nuts" all connecting members shall be accurately set, properly secured and drawn tight. Light drifting only will be permitted without enlarging holes. Where reaming is necessary to complete an alignment or in making replacement of loose bolts or those not properly locked, this shall be done with twist drills and oil. Whenever holes are reamed the next larger standard diameter "Structural Rib Bolt" and "Anco-Nut" with identical grip dimension shall be used. "Structural Rib Bolts" shall be driven through the hole with hand hammer, sledge or power hammer and the "Anco-Nuts" drawn to a tight seat with structural, ratchet or pneumatic wrench.

For all common bolts including anchors, foundation, studs, etc., "Anco-(Automatic Lock) Nuts" shall be used, to secure against loosening by vibration. All bolts and studs shall have American National Standard, Heavy (USS) threads, No. 2 fit, plain or galvanized as indicated in specifications or shown on the drawings.

THE "ANCO-NUT"

Locked



Unlocked

Data on the "Anco-Nut"

Automatic Nuts—U.S. Standard will fit any bolts; lock and unlock using ordinary wrench.

Nut—U. S. Standard C.P. Hex Anco.

Specifications—Carbon manganese steel minimum tensile strength 70,000 lbs. per sq. in.

Lock-pin—Integral part of the nut made of chrome vanadium steel containing high percentage of nickel. Corrosion of the nut does not affect the efficiency of the locking.

Vibration—Tends to tighten locking. It cannot unlock Anco-Nuts.

Furnished—Galvanized or black.

Thread—U.S.S. or S.A.E. Standard.

Why "Anco-Nuts" Stay Locked

The end of the locking pin travels between the threads of the bolt.

In doing this, the pin assumes automatically a fixed angle, and establishes a point of impingement against the bolt—the pin biting into the body of the bolt and thus maintaining an anchorage against vibration and shock. This impingement really acts as a ratchet moving up and taking a new bite as the nut is drawn tighter, but always resisting and preventing the nut moving in the opposite direction—that is, becoming loose.

Securely Locked but Easy to Take Off

You cannot unlock it without using a wrench. After being thus unlocked and removed, an "Anco-Nut" can be replaced on the bolt—the pin then automatically and instantly takes its former fixed angle position and the ratchet effect is restored and locking of the nut is re-established. "Anco-Nuts" may be thus put on and taken off repeatedly without damage to pin, threads, nut or bolt.

Advantages

Only a wrench is necessary to install or take off.

The nut and lock are a single unit. No separate parts to be mislaid or forgotten during installation. No matter how unskilled the labor, it is foolproof and may be used repeatedly.

Price is comparable to the ordinary nut and lock washer.

Users of "Structural Rib Bolts"

Having been approved by Federal, State, Municipal and Private Engineers, many of the leading architects specified "Structural Rib Bolts" in the following types of buildings:

Private	Municipal	State	Federal
Factories	Court Houses	Hospitals	Post Offices
Hotels	Warehouses	Colleges	Veterans' Homes
Banks	Auditoriums	Highway Bridges	Veterans' Hospitals
Breweries	Schools	Police Towers	Veterans' Administration Buildings
Theatres	Gymnasiums	Canal Gates	CCC Camps
Schools	Prisons	Penitentiaries	Dams
Greenhouses	Docks	Administration Buildings	Flood Gates
Radio Towers	Athletic Fields	Capitol Buildings	Towers
Churches	Recreation Buildings		
Coal Tipples	Stadiums		
Oil Refineries			

THE DUPLEX HANGER CO.

East 53rd Street and Lakeside Avenue
CLEVELAND, OHIO

BRANCH OFFICES
BOSTON, MASS., 88 Broad Street
CHICAGO, ILL., 6310 Wentworth Avenue
NEW ORLEANS, LA., 3728 So. Prieur Street
NEW YORK, N. Y., 16 Warren Street
PHILADELPHIA, PA., 1316 No. 18th Street
PORTLAND, ORE., 316 S. E. Madison Street

Products

"Duplex" Joist, Wall, Concrete Block and I-Beam Hanger; "Duplex" Post Caps, Post Bases, Wall Plates and Wall Boxes, for warehouses, factories, heavy mill construction and all other wood constructed buildings.

For Duplex Incinerators, see File Index.

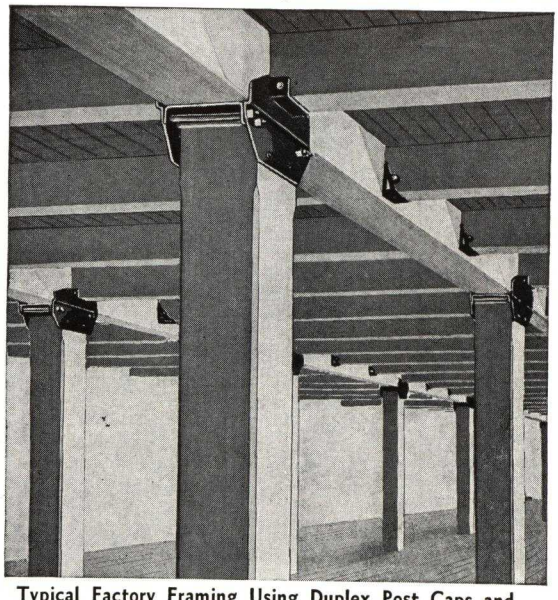
When Specifying

"Duplex" hangers and post caps are designed with a large factor of safety to carry timbers for which they are intended. If architects and engineers, when using hangers and post caps, specify "Duplex," proper hangers and post caps for the timbers will be furnished. Specifications are to be included in carpentry specifications.

DUPLEX POST CAPS, BASES AND HANGERS—THE QUALITY LINE FOR HEAVY MILL CONSTRUCTION

"Duplex" Joist Hanger

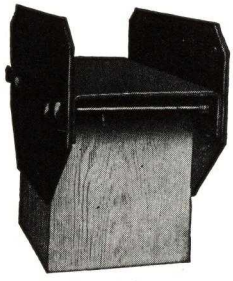
Economical hanger for timber framing. Made of malleable iron and every hanger is thoroughly tested.
"Duplex" Joist Hangers reduce the shrinkage of joists to a minimum



Typical Factory Framing Using Duplex Post Caps and Joist Hangers

R & L Joist Hanger

For the heaviest type of mill construction. By using this type of hanger, the entire building is tied together laterally. No other method of construction does this. Made in two parts and can be adjusted to fit the various timbers for which they are intended

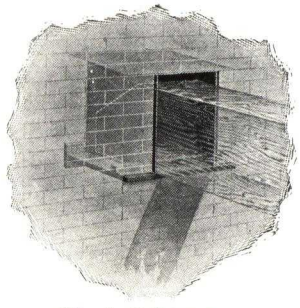


Two-way Construction

"Duplex" Steel Post Caps

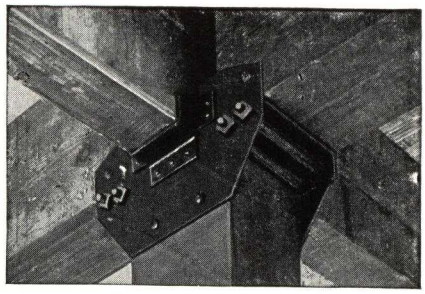
"Duplex" Post Caps are made of mild, open hearth steel and consist of three pieces: a bearing bracket and two side plates bolted together with four heavy bolts. Engineers who have investigated and used this cap are unanimous in declaring it to be an ideal design for rigid construction.

Tests have fully proven the great strength of this design and that it is not possible to break the cap when even more than six times the ultimate safe load of the timber is applied. These caps are furnished for 1-way, 2-way, 3-way and 4-way construction and may be had for timbers larger than the post.

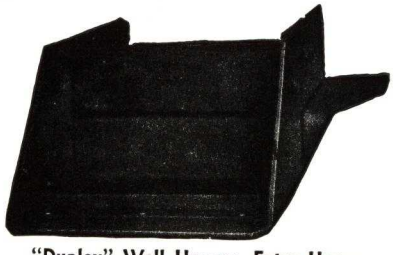


"Duplex" Wall Box

The "Duplex" Wall Box is designed for anchoring timber beams and girders in brick and masonry walls and as a protection against dry rot. A steel box is riveted to the Duplex Wall Plate, providing for a free circulation of air around the timber. Furnished with a cover plate if required



Four-way Construction

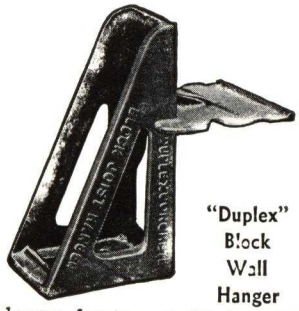


"Duplex" Wall Hanger, Extra Heavy

"Underwriters' Type" steel wall hanger for heavy mill construction. Carries timbers clear of the wall and distributes the load perfectly over the bearing surface of the masonry. Furnished for standard and extra heavy construction

"Duplex" Steel Post Base

Made of steel plates and angles to fit the post. More economical than cast iron plates



"Duplex" Block Wall Hanger

This hanger for concrete block construction is made with a larger bearing plate than our ordinary wall hangers so as to distribute the load over a greater area of the concrete block. Very practical where it becomes necessary to frame joists into old brick walls or party walls. Avoids the cutting of a large hole

THE IDEAL HANGER COMPANY

Manufacturers of Timber Fittings for Mill Type Buildings

1270 East 53rd Street, CLEVELAND, OHIO

CHICAGO, ILL., 6310 Wentworth Avenue—Telephone, Normal 0799
NEW YORK, N. Y., Sargent Building Specialties Co., 16 Warren Street—Telephone, Barclay 7-5875
PHILADELPHIA, PA., Kahn Products Co.—Telephone, Poplar 2924

Products

IDEAL JOIST HANGERS:

Wall Hangers, Wall Boxes and Metal Lumber Hangers.

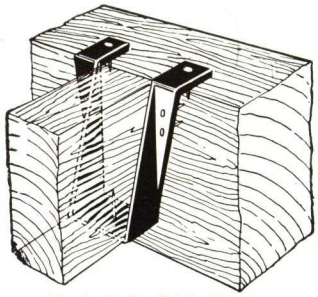
POST CAPS.

POST BASES.

Also Barn Framing Fittings.

Service

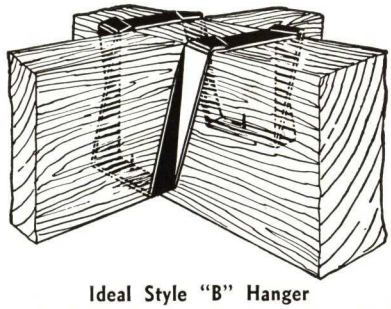
Ideal post caps, Ideal hangers and other Ideal products are made of the best material obtainable by competent workmen on modern machines. Prompt shipments are made from stock. Estimates and quotations cheerfully furnished and designs submitted by engineers who are specialists in timber construction.



Ideal Style "A" Hanger

A single hanger of the best grade open-hearth steel, formed cold to shape best adapted to framing timbers of every size. Fastens to timber with spike or lag screw.

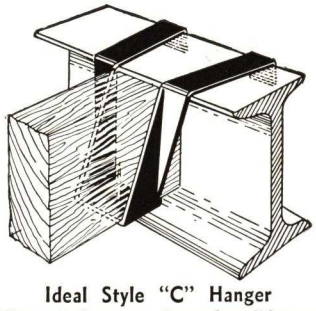
2x6-in. up to 12x16-in. hangers in stock



Ideal Style "B" Hanger

A double hanger for use where joists frame opposite each other on a wood girder or I-beam. Made of two single hangers with riveted strap connections, the strongest possible construction.

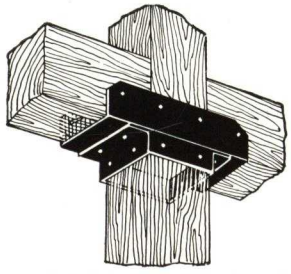
2x6-in. up to 12x16-in. hangers in stock



Ideal Style "C" Hanger

Where timbers are framed to I-beams, this hanger with the arms crossing the top of the girder provides safest and most economical construction. Also used with wood girders.

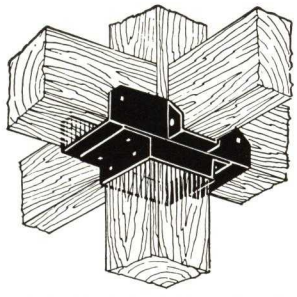
2x6-in. up to 12x16-in. hangers in stock



Ideal Steel Post Cap, No. 2

Easily installed—no framing necessary. Channel of open-hearth steel riveted to socket, provides rigid construction.

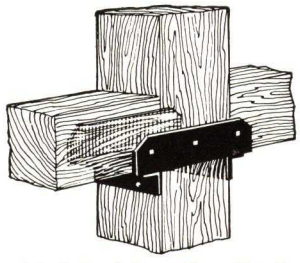
6x6-in. up to 16x16-in. post caps in stock



Ideal Steel Post Cap, No. 2
(Showing 3 and 4-way Construction)

Built with the same attention to engineering standards as other Ideal Framing Products.

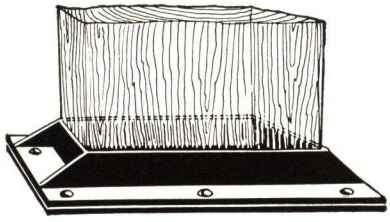
The brackets on the side of the cap are riveted thereon to carry the beams framing in at the side, and are placed so the girder and beams will be flush on top, unless otherwise noted



Ideal Steel Post Cap, No. 3

The strongest light weight post cap made. Meets every demand for framing posts and girders under moderate loads.

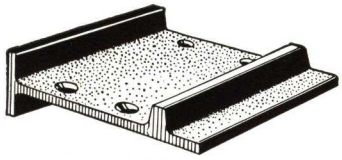
6x6-in. up to 12x16-in. post caps in stock



Ideal Post Bases

A heavy steel plate, with angles riveted thereon, furnishes the best possible socket for timber posts.

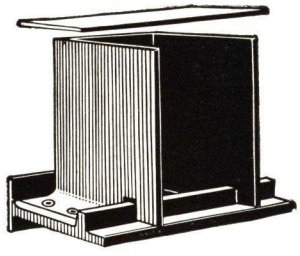
6x6-in. up to 16x16-in. in stock



Wall Plates

One-piece construction of malleable iron, far superior to cast iron. Note features of superiority in use.

Carried in stock in all sizes



Wall Box

To anchor beams in brick walls, and to protect them against dry rot. Malleable plate and steel box riveted thereto.

In stock in all sizes

MEMORANDA

MASONRY MATERIALS 4

- SECTION -

Section Number 1/5 Catalog Number

CATALOGS 1 to 54

MANUFACTURERS

THIS INDEX INCLUDES ONLY MANUFACTURERS WHOSE CATALOGS ARE FILED IN THIS SECTION

Alberene Stone Corp. of Virginia 4/18
American Blue Stone Co. 4/17
American Cyanamid & Chemical Corp. 4/43
American Terra Cotta Corp. 4/21
Appalachian Marble Co., Inc. 4/7
Arketex Ceramic Corp. 4/30
Atlantic Terra Cotta Co. 4/22
Atlas Mineral Products Co. of Pennsylvania 4/54
Belden Brick Co. 4/28
Briar Hill Stone Co. 4/14
Builders' Cushion Joint Co. 4/27
Carney Co. 4/45
Carthage Marble Co. 4/8
Cast Stone Institute 4/20
Claycraft Co. 4/31
Clinton Metallic Paint Co. 4/53
Cold Spring Granite Co., Inc. 4/1
Conkling Armstrong Terra Cotta Co. 4/23
Continental Clay Products Co. 4/32
Cut Stone Assn. of Indiana 4/11
Durr, A., & Co. 4/40
Eastern Terra Cotta Co. 4/24
Federal Seaboard Terra Cotta Corp. 4/25
Fletcher, H. E., Co. 4/2
Galloway Terra Cotta Co. 4/26
Glazed Brick & Tile Institute 4/33
Goss, John L., Corp. 4/3
Granidur Products Co. 4/19
Granite Assn. 4/4
Hydraulic-Press Brick Co. 4/34
Hy-Test Cement Co. 4/46
Indiana Limestone Corp. 4/12
Kosmos Portland Cement Co., Inc. 4/47
Libby-Owens-Ford Glass Co. 4/37
Locher & Co., Inc. 4/29
Louisville Cement Co., Inc. 4/48
McCormick Longmeadow Stone Co., Inc. 4/15
Medusa Portland Cement Co. 4/49
National Fireproofing Corp.
Face Tile 4/35
Structural Tile 4/42
North Carolina Granite Corp. 4/5
Owens-Illinois Glass Co. 4/38
Pittsburgh Corning Corp. 4/39
Portland Cement Assn. 4/44
Rees-Volckmann Co., Inc. 4/9
Riverton Lime & Stone Co., Inc. 4/50
Robinson Clay Products Co. 4/41
Stark Brick Co. 4/36
Sullivan Granite Co. 4/6
Superior Cement Corp. 4/51
United States Gypsum Co. 4/52
Vermont Marble Co. 4/10
Vermont Structural Slate Co. 4/13
Virginia Greenstone Co., Inc. 4/16

PRODUCTS

THIS INDEX INCLUDES ADDITIONAL INFORMATION WHICH IS FILED IN OTHER SECTIONS

Products described or illustrated in manufacturers' catalogs are indexed by section and catalog numbers. All names are listed alphabetically under each product heading.

AGGREGATES
Concrete—Lightweight
Aerocrete Corp. of America 3/30
Aquabar Waterproofing Products, Inc. 5/3
Embeco 5/15
Federal-American Cement Tile Co. 3/32
Haydite 4/34
Kalman Floor Co., Inc. 11/12
Master Builders Co. 5/15
Nailcrete Corp. 3/34
Porete Mfg. Co. 3/35
Washington Concrete Corp. 11/15
Zonolite Co. 10/20
Specifications 3/34; 11/12

ARCHITECTURAL
Terra Cotta
See Terra Cotta—Architectural

ARTIFICIAL
Stone
See Stone—Cast

ASHLAR
Products
See Particular Material as Terra Cotta; Stone; Granite

BEAM
Coverings—Tile
See Tile Form—Hollow Gypsum; Tile—Hollow—Clay or Terra Cotta

BLOCKS
Furring
See Tile Form—Hollow Gypsum; Tile—Hollow—Clay or Terra Cotta

BLOCKS—Cont.
Glass
See Brick—Glass

Granite
See Granite

Gypsum
See Tile Form—Hollow—Gypsum

Hollow Glass
See Tile Form—Hollow—Glass; Brick—Glass

Hollow Tile
See Tile—Hollow—Clay or Terra Cotta; Tile Form—Hollow—Gypsum; Tile Form—Hollow or Solid—Cinder Concrete

BLOCKS—Cont.

Lightweight Concrete
- **Aerocrete Corp. of America** 3/30
- **National Naylegrip Co., Inc.** 3/33
- **Porete Mfg. Co.** 3/35
- Specifications 3/30

Nailing Concrete
See Tile Form—Hollow or Solid—Cinder Concrete

Paving—Granite
- **Fletcher, H. E., Co.** 4/2
- **North Carolina Granite Corp.** .. 4/5

Segment—Tile
See Tile—Hollow—Clay or Terra Cotta—Segmental and Flat Arch

Slate
See Slate 11

BLUESTONE

Ashlar
- **American Blue Stone Co.** 4/17
- Genesee Valley 4/17
- North River 4/17
- Specifications 4/17

Natural
- **American Blue Stone Co.** 4/17
- Genesee Valley 4/17
- North River 4/17
- See also 11/26
- Specifications 4/17

BRICK

Acid Resistant
See Brick—Floor—Packing House, Battery Room, etc.

Ceramic—Glazed
- Brictile 4/36
- **Claycraft Co.** 4/31
- **Glazed Brick & Tile Institute** .. 4/33
- **Hydraulic-Press Brick Co.** 4/34
- Hy-tex 4/34
- Perma-Chrome 4/31
- **Stark Brick Co.** 4/36
- Tribric 4/36
- Vitriface 4/31
- Vitrigranite 4/31
- Vitristone 4/31
- Specifications 4/33

Common—Clay, Sand, Lime, etc.
- **Belden Brick Co.** 4/28
- Hy-tex 4/34

Enameled
- Brictile 4/36
- **Continental Clay Products Co.** .. 4/32
- Equitable 4/34
- **Glazed Brick & Tile Institute** .. 4/33
- **Hydraulic-Press Brick Co.** 4/34
- Hy-tex 4/34
- **Kraftile Co.** 11/3
- **Stark Brick Co.** 4/36
- Tribric 4/36
- Vitri-cote 4/34
- Vitri-glaze 4/34
- Specifications 4/33

Face or Front
- **Belden Brick Co.** 4/28
- Brictile 4/36
- **Claycraft Co.** 4/31
- **Continental Clay Products Co.** .. 4/32
- Coral-Tex 4/31
- **Glazed Brick & Tile Institute** .. 4/33
- Harvard 4/36
- **Hydraulic-Press Brick Co.** 4/34
- Hy-tex 4/34
- Kil-Kraft 6/28
- **Locher & Co., Inc.** 4/29
- McNees-Kittanning 4/32
- Mello-Tone 4/31
- Natco 4/35
- **National Fireproofing Corp.** 4/35
- **Stark Brick Co.** 4/36
- Tribric 4/36
- Vitribrik 4/35
- Vitritex 4/28
- Specifications 4/33; 4/35

BRICK—Cont.

Floor—Packing House, Battery Room, Dairies, etc.
- **Belden Brick Co.** 4/28
- **Carlyle Tile Co.** 11/5
- **Continental Clay Products Co.** .. 4/32
- **Glazed Brick & Tile Institute** .. 4/33
- **Stark Brick Co.** 4/36
- Specifications 4/33

Glass
- **American 3 Way-Luxfer Prism Co.** 7/1; 18/5
- Carrara 4/39
- Insulux 4/38; 18/11
- **Libbey-Owens-Ford Glass Co.** .. 18/3
- L-O-F 18/3
- Magnalite 7/1; 18/5
- **Owens-Illinois Glass Co.** .. 4/38; 18/11
- PC 4/39; 18/4
- **Pittsburgh Corning Corp.** 4/39
- **Pittsburgh Plate Glass Co.** 18/4
- **Richards, J. Merrill** 18/5
- 3 Way-Luxifer 7/1
- Vitrolite 18/3
- Specifications 4/38; 4/39

Glazed
See Brick—Salt Glazed; Brick—Enameled

Hollow
- Brictile 4/36
- FaceTile 4/36
- Hy-tex 4/34
- **Stark Brick Co.** 4/36
- Tribric 4/36

Hollow Tile
See Tile—Hollow, Clay or Terra Cotta—Load Bearing

Paving
- Hy-tex 4/34

Porcelain
See Brick—Enameled

Salt Glazed
- Ar-Ke-Tex 4/30
- **Arketex Ceramic Corp.** 4/30
- Brictile 4/36
- **Continental Clay Products Co.** .. 4/32
- **Glazed Brick & Tile Institute** .. 4/33
- **Hydraulic-Press Brick Co.** 4/34
- Hy-tex 4/34
- Natco 4/35
- **National Fireproofing Corp.** 4/35
- **Stark Brick Co.** 4/36
- Tribric 4/36
- Vitribrik 4/35
- Specifications 4/33; 4/35

Salt Glazed—Smooth
- **Hydraulic-Press Brick Co.** 4/34
- Hy-tex 4/34
- Specifications 4/35

Special Shapes—Moulded, Arch, etc.
- **Belden Brick Co.** 4/28
- **Continental Clay Products Co.** .. 4/32
- **Glazed Brick & Tile Institute** .. 4/33
- **Hydraulic-Press Brick Co.** 4/34
- Hy-tex 4/34
- Kil-Kraft 6/28
- **Locher & Co., Inc.** 4/29
- **Stark Brick Co.** 4/36
- Specifications 4/33

BROWN SAND STONE
- **McCormick Longmeadow Stone Co., Inc.** 4/15

CAEN STONE

Reproduction
See Stone—Cast

CAPS AND POTS, CHIMNEY

Clay, Terra Cotta or Art Marble
See Chimney—Caps and Pots

CAPS AND TOPS

Chimney
See Chimney—Caps

CEMENT

Acidproof—for Tanks, Sewers, Drains, Fume Ducts, etc.
- **Atlas Mineral Products Co. of Pennsylvania** 4/54
- Carbo-Vitrobond 4/54
- G-K 4/54
- Korez 4/54
- Mineralead 4/54
- Tegul-Ampco 4/54
- Tegul-Tileset 4/54
- Vitrex 4/54
- Vitrobond 4/54

Masonry
- Blubag 9/22
- Brixment 4/48
- **Carney Co.** 4/45
- Flamingo 4/50
- **Hy-Test Cement Co.** 4/46
- Kosmortar 4/47
- **Kosmos Portland Cement Co., Inc.** 4/47
- **Louisville Cement Co., Inc.** 4/48
- Medusa-BrikseT 4/49
- **Medusa Portland Cement Co.** 4/49
- Medusa StoneseT 4/49
- Mortar BVI 4/46
- **Riverton Lime & Stone Co., Inc.** 4/50
- **Superior Cement Corp.** 4/51
- Wifco 4/51
- **Woodville Lime Products Co.** .. 9/22
- Specifications 4/45; 4/46; 4/47; 4/48; 4/49; 4/51

Masonry—Colored
See Cement—Portland—Colored

Masonry—Non-Staining
See Cement—Non-Staining

Masonry—Waterproofed
See Cement—Portland—Waterproofed

Non-Staining
- Atlas 11/24
- Atlas Waterproofed White 11/24
- Atlas White 11/24
- **Medusa Portland Cement Co.** .. 4/49
- Medusa StoneseT 4/49
- **Superior Cement Corp.** 4/51
- **Universal Atlas Cement Co.** 11/24
- Wifco 4/51
- Specifications 4/49; 4/51

Plaster
See Cement—Portland

Portland
- **Artstone Rocor Corp.** 9/25
- Atlas 11/24
- Atlas Waterproofed White 11/24
- Atlas White 11/24
- **Ceresit Waterproofing Corp.** 5/7
- Craxement 5/7
- Kosmos-H.E.S. 4/47
- Medco 4/49
- **Medusa Portland Cement Co.** .. 4/49
- Plastic Marble 9/25
- **Portland Cement Assn.** 4/44
- Roman 9/25
- **Superior Cement Co.** 4/51
- Tri-Cal 4/51
- **Universal Atlas Cement Co.** 11/24
- Specifications 4/44; 4/51; 9/25

Portland—Colored
(Including—Pre-Mixed)
- **Artstone Rocor Corp.** 9/25
- Flamingo 4/50
- **Maximent Co.** 11/13
- Plastic Marble 9/25
- **Riverton Lime & Stone Co., Inc.** 4/50
- Roman 9/25
- **Superior Cement Corp.** 4/51
- Specifications 4/51; 9/25

CEMENT—Cont.

Portland—High Early Strength

Kosmos 4/47
Maximent Co. 11/13
Medco 4/49
Medusa Portland Cement Co. ... 4/49
Portland Cement Assn. 4/44
Superior Cement Corp. 4/51
Specifications 4/44

Portland—Waterproofed

Artstone Rocor Corp. 9/25
Atlas Waterproofed White 11/24
Kosmos 4/47
Medusa Portland Cement Co. 4/49
Superior Cement Corp. 4/51
Universal Atlas Cement Co. 11/24
Specifications 4/51; 9/25

Portland—White

Atlas Waterproofed White 11/24
Atlas White 11/24
Medusa Portland Cement Co. ... 4/49
Portland Cement Assn. 4/44
Universal Atlas Cement Co. 11/24
Specifications 4/44; 4/49

CHIMNEY

Caps and Pots—Clay, Terra Cotta or Art Marble

Atlantic Terra Cotta Co. 4/22
Galloway Terra Cotta Co. 4/26
Ludowici-Celadon Co. 6/27
Robinson Clay Products Co. 4/41
See also 4/21; 4/23; 4/24

COLUMNS

Coverings for

See Tile—Hollow—Clay or Terra Cotta — Partition — Furring, Beam and Column Covering, etc.; Tile Form—Hollow—Gypsum—Partition—Furring, Beam and Column Covering, etc.

Granite, Stone, Marble

See 26/138

COMPOSITIONS

Stone

See Stone—Cast—Interior and/or Exterior

CONCRETE

Aggregates—Lightweight

See Aggregates—Concrete—Lightweight

Architectural

Portland Cement Assn. 4/44
Specifications 4/44

Ashlar Masonry

Portland Cement Assn. 4/44

Blocks—Metal Covered

See Blocks—Lightweight Concrete—Metal or Porcelain Faced

Cast Stone Interior and/or Exterior

See Stone—Cast—Interior and/or Exterior

Lightweight—Glass Covered

Glastone 4/37
LOF 4/37
Libby-Owens-Ford Glass Co. 4/37

Portland Cement

See Cement—Portland

COPINGS

Wall—Clay or Terra Cotta

Lap-Lok 4/41
Robinson Clay Products Co. 4/41
See also 4/24

Wall—Metal Covered

(See also Extruded and/or Drawn Metal) 13
Aluminum Co. of America 13/13
Durr, A. Co. 4/40

Wall—Stone

Vickery Stone Co. 11/26
Vickstone 11/26
Specifications 11/26

COVE BASE

Soapstone

Alberene Stone Corp. of Virginia 4/18
Virginia Alberene 4/18
Virginia Black Serpentine 4/18
Virginia Tremolite Green 4/18

COVERINGS

Beam, Girder and Column

See Tile—Hollow—Clay or Terra Cotta; Tile Form—Hollow Gypsum; Tile Form — Hollow or Solid — Cinder Concrete

Wall—Ashlar

See Specific Type of Stone

CRESTINGS

Decorative

See Terra Cotta

CUT

Stone

See Specific Type of Stone, as: Bluestone, Granite, Marble, etc.

ENAMELED

Brick

See Brick—Enameled

FABRICATORS

Granite

See Granite—Standard Building, Architectural or Monumental

FINIALS

See Terra Cotta; Stone; etc.

FIREPLACE

Linings—Soapstone

Virginia Alberene 4/18
Virginia Black Serpentine 4/18
Virginia Tremolite Green 4/18

FLOORING

Brick

See Brick—Floor—Packing House, Battery Room, Dairies, etc.; Brick—Paving

Cement

See Cement—Portland

Stone

See Specific Type of Stone

FLUE

Linings

(See also Refractory)
Robinson Clay Products Co. 4/41

FRONT WORK

Terra Cotta

See Terra Cotta—Architectural

FURRING

Gypsum

See Tile Form—Hollow—Gypsum

Hollow Tile

See Tile—Hollow Clay or Terra Cotta —Partition, Furring, Beam and Column Covering, etc.

GLASS

Brick or Block

See Brick—Glass

Masonry

See Brick—Glass

GLAZED

Brick

See Brick — Salt Glazed; Brick — Enameled; Brick—Ceramic—Glazed

Tile

See Tile—Hollow Clay or Terra Cotta —Glazed

GRANITE

Ashlar

Fletcher, H. E., Co. 4/2
Goss, John L., Corp. 4/3
North Carolina Granite Corp. 4/5

GRANITE—Cont.

Cast

Granidur Products Co. 4/19
Specifications 4/19

Crushed

North Carolina Granite Corp. .. 4/5
Sullivan Granite Co. 4/6

Curbing

Fletcher, H. E., Co. 4/2
North Caroline Granite Corp. 4/5

Paving Blocks

See Blocks—Paving—Granite

Standard Building, Architectural or Monumental

Bear Den Quarry 4/2
Chelmsford Bulfinch 4/2
Chelmsford Gray 4/2
Chelmsford White 4/2
Cold Spring Agate 4/1
Cold Spring Black Diamond 4/1
Cold Spring Carnelian 4/1
Cold Spring Granite Co., Inc. 4/1
Cold Spring Mahogany 4/1
Cold Spring Pearl Pink 4/1
Cold Spring Pearl White 4/1
Cold Spring Rainbow 4/1
Cold Spring Ruby Red 4/1
Cold Spring Veined Ebony 4/1
Fletcher, H. E., Co. 4/2
Goss, John L., Corp. 4/3
Granite Assn. 4/4
Milford Buff 4/2
Milford N.H. 4/2
Mildford Pink 4/2
Mt. Airy 4/5
Mt. Airy White 4/5
North Carolina Granite Corp. .. 4/5
Pink Deer Island 4/3
Sullivan Granite Co. 4/6
Sullivan-Westerly 4/6
See also 11/26

GREENSTONE

Natural

Virginia Greenstone Co., Inc. .. 4/16
See 11/26

INSULATING

Glass Vacuum Block

See Tile Form—Hollow Glass

JOINTING

Materials—Acidproof

Ampco 4/54
Atlas Mineral Products Co., of Pennsylvania 4/54
Mineralead 4/54

LIME

Hydrated Masons'

Ace High 9/22
Banner 9/20
Certain-teed Products Corp. 9/3
Gold Bond 9/9
Kelley Island Lime & Transport Co. 9/19
Marble Rock 4/52
Mastite 9/21
National Gypsum Co. 9/9
National Mortar & Supply Co. .. 9/20
Ohio Hydrate & Supply Co. 9/21
Red Top 4/52
Snowdrift 4/52
Superior 9/20
Tiger 9/19
USG 4/52
United States Gypsum Co. 4/52
Weatherite 9/22
Woodville Lime Products Co. 9/22
See also 9/23
Specifications 9/9; 9/19; 9/20

Hydraulic Masons'

Flamingo 4/50
Riverton Lime & Stone Co., Inc. 4/50

LIME—Cont.
Waterproofed
Flamingo 4/50
Riverton Lime & Stone Co., Inc. 4/50
Weatherite 9/22
Woodville Lime Products Co... 9/22

LIMESTONE
Cut Stone Assn. of Indiana.... 4/11
Ilco 4/12
Indiana 4/11
Indiana Limestone Corp...... 4/12
See also 11/26

LINER
Plates
See 4/41

LINTELS
Brick, Stone or Tile
See Specific Kind of Brick, Stone, Tile

MARBLE
Artificial
See Stone—Cast
Ashlar
Appalachian Marble Co., Inc... 4/7
Crushed
Granito 4/7
Interior and Exterior—Foreign or Domestic
Appalachian Marble Co., Inc... 4/7
Carthage Marble Corp...... 4/8
CH Hauteville..... 4/9
Fleuri 4/8
Jetmar 4/10
Ozark 4/8
Rees-Volckmann Co., Inc...... 4/9
Tavernelle 4/8
Vermont Marble Co...... 4/10
Specifications 4/8; 4/10
Slabs—Translucent
Lumar 4/10
Lumar Antique..... 4/10
Lumar Brocadillo..... 4/10
Lumar Green Vein..... 4/10
Lumar Pavonazzo..... 4/10
Lumar Red..... 4/10
Lumar Yule..... 4/10
Vermont Marble Co...... 4/10

MAUSOLEUMS
Granite, Marble, etc.
See Granite; Marble

MEMORIALS
Granite, Marble, etc.
See Granite; Marble

METAL COVERED
Concrete Stone
See Stone—Concrete—Metal Covered

MONUMENTS
Granite, Marble, etc.
See Memorials—Granite, Marble, etc.; Mausoleums—Granite, Marble, etc.; Granite; Marble

MORTAR
Bricklayers'
See Cement—Masonry
Hydrated Lime and Cement
See Lime—Hydrated Masons'; Cement Portland
Hydraulic Lime
Flamingo 4/50
Riverton Lime & Stone Co., Inc. 4/50
Lime Hydrated Finishing
See Plaster—Lime Hydrated Finishing 9

MORTAR—Cont.
Portland Cement
Kosmortar 4/47
Kosmos Portland Cement Co., Inc. 4/47
Maximent Co......11/13
Maxtone 11/13
Medusa-BrikseT 4/49
Medusa Portland Cement Co... 4/49
Medusa-StoneseT 4/49
R.I.W. 5/22
Superior Cement Corp. 4/51
Toch Brothers Inc. 5/22
Wifco 4/51
Specifications 4/47; 4/51
Portland Cement—Colored
Rocor 9/25
Superior Cement Corp...... 4/51
Wifco 4/51
Specifications 4/51
Portland Cement—Non-staining
See Cement—Non-staining
Portland Cement—Waterproofed
See Cement—Portland—Waterproofed

ORNAMENTS
Terra Cotta
See Terra Cotta—Architectural

PARTITIONS
Tile
See Tile Form—Hollow Clay or Terra Cotta; Tile Form—Hollow Gypsum—Partition

PAVING
Granite
See Blocks—Paving Granite

PLASTER
Blocks
See Tile Form—Hollow—Gypsum
Cement—Portland
See Cement—Portland
Portland Cement
See Cement—Portland

PORCELAIN
Brick
See Brick—Enameled

PORTLAND
Cement
See Cement—Portland

POTS
Chimney
See Chimney—Caps and Pots—Clay or Terra Cotta

PRECAST
Stone
See Stone—Cast

RAILS
Hand—Terra Cotta
Kraftile Co. 11/3

RIPRAP
Granite
See Granite

SANDSTONE
Ashlar
Briar Hill Stone Co...... 4/14
Golden Tone 4/14
Natural
American Blue Stone Co...... 4/17
Briar Hill Stone Co...... 4/14
Golden Tone 4/14
Longmeadow 4/15
McCormick Longmeadow Stone Co., Inc. 4/15
Naturcleft 4/17
See also 11/26

SILLS
Stone
See Specific Type of Stone, as: Bluestone; Granite; Marble; Stone—Soapstone

SLABS
Metal Covered—Concrete Stone
See Stone—Concrete
Soapstone
See Soapstone

SOAPSTONE
Alberene Stone Corp. of Virginia 4/18
Virginia Alberene 4/18
Virginia Black Serpentine..... 4/18
Virginia Tremolite Green..... 4/18

SPANDRELS
Greenstone
See Greenstone
Stone
See Stone—Soapstone
Terra Cotta
See Terra Cotta—Architectural

STATUARY
Terra Cotta
See Terra Cotta—Architectural

STONE
(See also Bluestone; Granite; Marble; Sandstone; Slate; Colored—Premixed)
Ashlar
(See also Specific Type of Stone)
Akoustolith 10/40
Guastavino, R., Co. 10/40
Ashlar—Shot Sawed
See Specific Kind of Stone
Bluestone
See Bluestone—Natural
Brown Sand Stone
See Brown Sand Stone
Cast—Interior and/or Exterior
(See also Precast—Art Marble)
Akoustolith 10/40
Algonite 12/9
Calicel 10/37
Calistone 10/37
Castone 10/37
Cast Stone Institute 4/20
Celotex Corp. 10/37
Granidur Products Co...... 4/19
Guastavino, R., Co......10/40
Marcrome Art Marble Co...... 12/9
See also 3/35
Specifications 4/19; 4/20
Concrete—Glass Covered
Glastone 4/37
LOF 4/37
Libby-Owens-Ford Glass Co.... 4/37
Cut
See Specific Type of Stone; Stone—Cast
Greenstone
See Greenstone
Limestone
See Limestone
Natural
See Bluestone; Greenstone; Granite; Marble; Sandstone; Slate, etc.
Sandstone
See Sandstone
Soapstone
Alberene Stone Corp. of Virginia 4/18
Virginia Alberene 4/18
Virginia Black Serpentine..... 4/18
Virginia Tremolite Green..... 4/18

STORE FRONTS

Stone
See Specific Type of Stone

Terra Cotta
See Terra Cotta

STUCCO

Base
See Tile—Hollow—Clay or Terra Cotta, Exterior and Load Bearing; Tile Form—Hollow or Solid—Cinder Concrete

Hydraulic Lime
See Lime—Hydraulic Masons; Cement—Portland

SWIMMING POOL

Brick
See Brick

Tile
See Tile—Hollow—Clay or Terra Cotta

TANKS

Cement—Acidproof
Atlas Mineral Products Co. of Pennsylvania 4/54
Korez 4/54
Vitrex 4/54
Vitrobond 4/54

TERRA COTTA
(Exterior and Interior)

Architectural
American Terra Cotta Corp. 4/21
Atlantic Terra Cotta Co. 4/22
Conkling Armstrong Terra Cotta Co. 4/23
Eastern Terra Cotta Co. 4/24
Federal Seaboard Terra Cotta Corp. 4/25
Kraftile Co. 11/3
See also 4/26

Ashlar
American Terra Cotta Corp. 4/21
Atlantic Terra Cotta Co. 4/22
Conkling Armstrong Terra Cotta Co. 4/23
Eastern Terra Cotta Co. 4/24
Enduro 4/25
Federal Seaboard Terra Cotta Corp. 4/25

Blocks
See Tile—Hollow—Clay or Terra Cotta

Chimney Caps
See Chimney—Caps and Pots—Clay or Terra Cotta

THRESHOLDS AND SADDLES

Bluestone
Ambluco Non-slip 12/6
American Blue Stone Co. 12/6
Specifications 12/6

Slate
Allenstone 4/13

Soapstone
Virginia Alberene 4/18
Virginia Black Serpentine 4/18
Virginia Tremolite Green 4/18

TILE

Backup
See Tile Form—Hollow or Solid—Cinder Concrete—Load Bearing, Partition, Furring, Floor, Arch, etc.

Facing
See Tile—Hollow Clay or Terra Cotta—Glazed

TILE—Cont.

Glazed
See Tile—Hollow Clay or Terra Cotta—Glazed; Brick—Salt Glazed

Hollow—Clay or Terra Cotta—Backing Up
See Tile—Hollow—Clay or Terra Cotta—Load Bearing

Hollow—Clay or Terra Cotta—Book
See Tile—Hollow—Clay or Terra Cotta—Partition, Furring, etc.

Hollow—Clay or Terra Cotta—Glazed or Unglazed
Alluvial 11/2
American Terra Cotta Corp. 4/21
Ar-Ke-Tex 4/30
Arketex Ceramic Corp. 4/30
Atlantic Terra Cotta Co. 4/22
Brictile 4/36
Claycroft Co. 4/31
Conkling Armstrong Terra Cotta Co. 4/23
Decorata 4/35
Eastern Terra Cotta Co. 4/24
FaceTile 4/36
Federal Seaboard Terra Cotta Corp. 4/25
Glazed Brick & Tile Institute .. 4/33
Hood, B. Mifflin, Co. 11/2
Hy-tex 4/34
Imper-Vit 11/6
Insul-Glaz 4/30
Kraftile Co. 11/3
Monotile 4/31
Natco 4/35; 4/42
National Fireproofing Corp. 4/35; 4/42
National Tile Co. 11/6
Stark Brick Co. 4/36
Speedwall 4/42
Tribric 4/36
Vitribrik 4/35
Vitritile 4/35
Specifications 4/25; 4/33; 4/35

Hollow—Clay or Terra Cotta—Load Bearing
American Terra Cotta Corp. 4/21
Ar-Ke-Tex 4/30
Arketex Ceramic Corp. 4/30
Atlantic Terra Cotta Co. 4/22
Brictile 4/36
Claycroft Co. 4/31
FaceTile 4/36
Glazed Brick & Tile Institute .. 4/33
Monotile 4/31
Natco 4/42
Natco Segmentile 4/42
Natco XXX 4/42
National Fireproofing Corp. 4/42
Speed-A-Backer 4/42
Speedtile 4/42
Stark Brick Co. 4/36
Tribric 4/36
VersaTile 4/42
Specifications 4/33

Hollow—Clay or Terra Cotta—Partition, Furring, Beam and Column Covering, etc.
American Terra Cotta Corp. 4/21
Ar-Ke-Tex 4/30
Arketex Ceramic Corp. 4/30
Atlantic Terra Cotta Co. 4/22
Brictile 4/36
Decorata 4/35
FaceTile 4/36
Federal Seaboard Terra Cotta Corp. 4/25
Glazed Brick & Tile Institute ... 4/33
Natco 4/35; 4/42

(Continued in Next Column)

TILE—Cont.

Hollow—Clay or Terra Cotta—Partition, Furring, Beam and Column Covering, etc.
(Continued from Previous Column)
National Fireproofing Corp. 4/35; 4/42
Speedwall 4/42
Stark Brick Co. 4/36
Tribric 4/36
Vitribrik 4/35
Vitritile 4/35
Specifications 4/33; 4/35

Hollow—Clay or Terra Cotta—Segmental and Flat Arch
Natco 4/42
Natco Segmentile 4/42
National Fireproofing Corp. 4/42
Robinson Clay Products Co. 4/41

Packing House
See Brick—Floor

Structural
See Tile—Hollow Clay or Terra Cotta—Load Bearing

Terra Cotta Glazed
See Tile—Clay or Terra Cotta—Glazed or Unglazed

Wall—Loading Bearing
See Tile—Hollow—Clay or Terra Cotta—Load Bearing

TILE FORM

Hollow Glass
(See also Brick—Glass)
Insulux 4/38; 18/11
Magnalite 7/8
Owens-Illinois Glass Co. 4/38; 18/11
Richards, J. Merrill 7/8
Specifications 4/38

Hollow—Gypsum—Partition, Furring, Beam and Column Covering, etc.
American Cyanamid & Chemical Corp. 4/43
Certain-teed Products Corp. 9/3
Gypsteel 4/43
Mathieson Alkali Works, Inc. .. 9/16
Pyrobar 3/29; 9/13
Southern 9/16
USG 3/29; 9/13
United States Gypsum Co. .. 3/29; 9/13
Wasem Plaster Co. 9/24
Specifications 3/29; 9/3; 9/13

Hollow or Solid—Cinder Concrete—Load Bearing, Partition, Furring, Floor Arch, etc.
Nailcrete Corp. 3/34
National Naylegrip Co., Inc. 3/33
Specifications 3/34

Roofing—Concrete
(See also Concrete—Lightweight)
Federal-American Cement Tile Co. 3/32
National Naylegrip Co., Inc. 3/33
Porete Mfg. Co. 3/35
Truscon Laboratories 3/37
Specifications 3/32

TRACERY

Window—Cast Stone
See Stone—Cast

TRAVERTINE

Reproduction
See Stone—Cast

TREADS

Greenstone
Virginia Greenstone Co., Inc. 4/16

Marble
See Marble

Soapstone
Virginia Alberene 4/18
Virginia Black Serpentine..... 4/18
Virginia Tremolite Green..... 4/18

TRIM

Concrete or Artificial Stone
Akoustolith 10/40
Guastavino, R., Co. 10/40

TRIM—Cont.

Soapstone
Alberene Stone Corp. of Virginia 4/18
Virginia Alberene 4/18
Virginia Black Serpentine..... 4/18
Virginia Tremolite Green..... 4/18

Tile
See Tile—Hollow—Clay or Terra Cotta

WAINSCOTING

Marble
See Marble—Interior and Exterior

Soapstone
See Soapstone

WALL

Base—Bluestone
See Bluestone—Natural

Facings—Cast Stone
Portland Cement Assn...... 4/44

WALLS

Ashlar Concrete Masonry
See Concrete—Ashlar Masonry

WATERPROOF

Lime
See Lime—Waterproof

COLD SPRING GRANITE COMPANY

Quarriers and Producers of Granite

GENERAL OFFICES AND PLANT

COLD SPRING, MINNESOTA

CONCERNING THIN, POLISHED GRANITE

While our organization is ready with unrivaled facilities to quickly and economically deliver granite of any thickness and specification you require, regardless of the size of the job, we believe these pages can serve you best with descriptions and detail concerning THIN, POLISHED GRANITE.

New found uses for this enduring veneer product have greatly increased. They include:

Entrance Features.

Base Courses and Bulkhead Base Courses.

Pilasters.

Lintels.

Spandrels.

Friezes.

Inserts.

Ashlar Facing.

Another successful year is added to the history of this preferred surfacing material which is now fabricated for advantageous use in most every exterior or interior modernizing and new construction project.

THIN, POLISHED GRANITE has proven to be unusually practical for use where quick and drastic temperature changes prevail. There is no expansion or contraction. There is no bulging. These granites are impervious to moisture. Consequently, there is no discoloration. The polished surfaces remain permanently clean. There is practically no maintenance cost. There will never be need for replacement because of scratches from heels or matches.

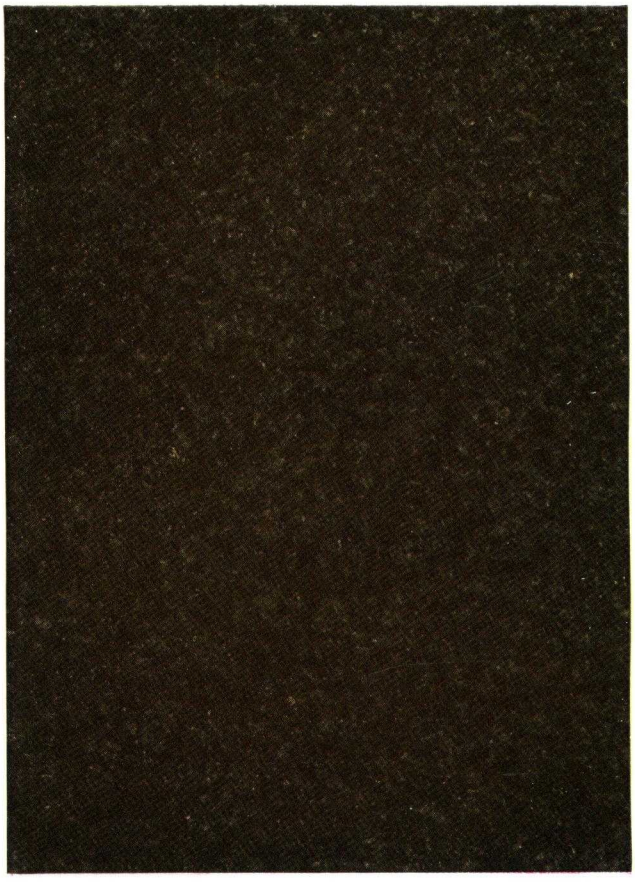
Because THIN, POLISHED GRANITE is cut down to thicknesses of 1¼ to 1¾ inches, it can be economically transported to any point in the United States. Installation is accomplished with minimum time and man power.

Please be referred to pages 2 and 6 of this section for more detailed information about THIN, POLISHED GRANITE.

Cold Spring Rainbow Granite—Polished Finish

PRODUCED ONLY BY COLD SPRING GRANITE COMPANY, COLD SPRING, MINN.

Cold Spring Rainbow Granite
Rubbed Finish



Cold Spring Black Diamond Granite
Polished Finish

PRECISION MANUFACTURE

All Cold Spring Granites are quarried by the Channel Process. Granite blocks are segregated from the quarry bed by a series of holes drilled in line. These blocks are lifted from the quarry without severe shock from blasting. The granite is therefore uniformly sound and there is less waste in production.

Highly efficient gang saws of our own design cut slabs from these blocks down to 1¼" thickness. Grinding and polishing machines, built by our engineers, complete the surface processing of the granite. Rotary grinding wheels of more than 10 ton pressure give every square foot of THIN, POLISHED GRANITE an absolutely flat surface. It can be truly said that granite surfaces polished in this manner will remain perpetually clean and bright. There are many advantages in having the base course or first story of a building faced with POLISHED granite. While we can supply any finish you may desire (Honed, Rubbed or Sawed and Sanded), for maximum, enduring satisfaction there is no match for polished surfaces. Many architects have welcomed the chance which low price affords to use polished surfaces not only in base courses but in superstructures as well.

Largest Variety of Colorful Granites

Your attention is directed to the color illustrations of Cold Spring Agate (Page 3) and Cold Spring Ruby Red (Page 4). These two granites have been added to the Cold Spring Group since the last issue of Sweet's Catalogue. These quarries were purchased to provide a complete assortment of colors and textural detail. There is now a premium quality Cold Spring granite to meet almost every requirement an architect may conceive. While these quarries have been operated for many years, Agate and Ruby Red granites have not been available in thin, polished slabs until now. Here is the complete assortment:

COLD SPRING RAINBOW GRANITE
COLD SPRING PEARL PINK GRANITE
COLD SPRING PEARL WHITE GRANITE
COLD SPRING CARNELIAN GRANITE
COLD SPRING RUBY RED GRANITE
COLD SPRING AGATE GRANITE
COLD SPRING VEINED EBONY BLACK GRANITE
COLD SPRING BLACK DIAMOND GRANITE

Provision is afforded for interesting color combinations by the use of two or more of these granites. For instance: Entrance features may be worked out in colors which blend harmoniously with other mass areas, or mass areas of granite may be framed with other granites of contrasting color.

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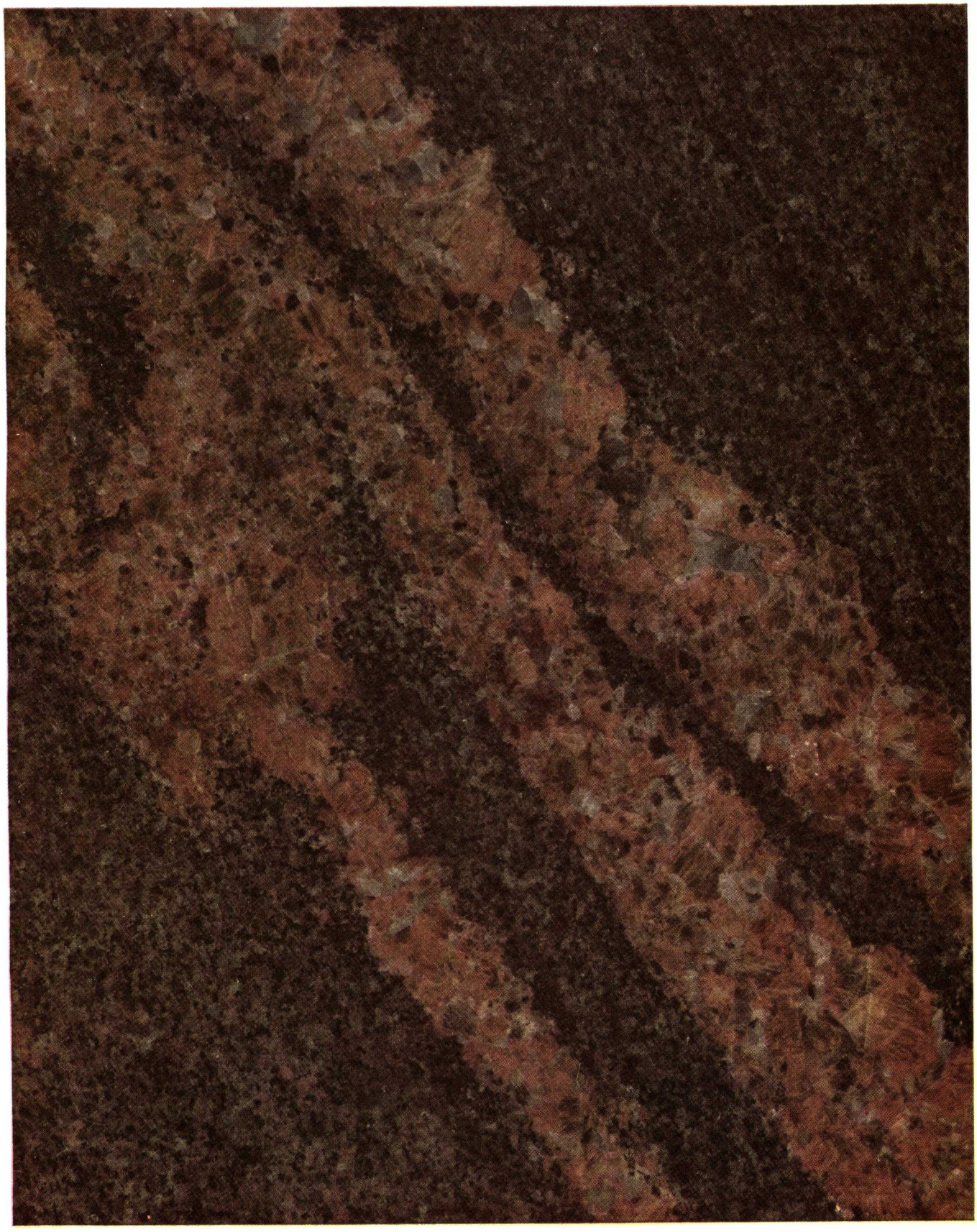

Cold Spring Agate Granite
Polished Finish

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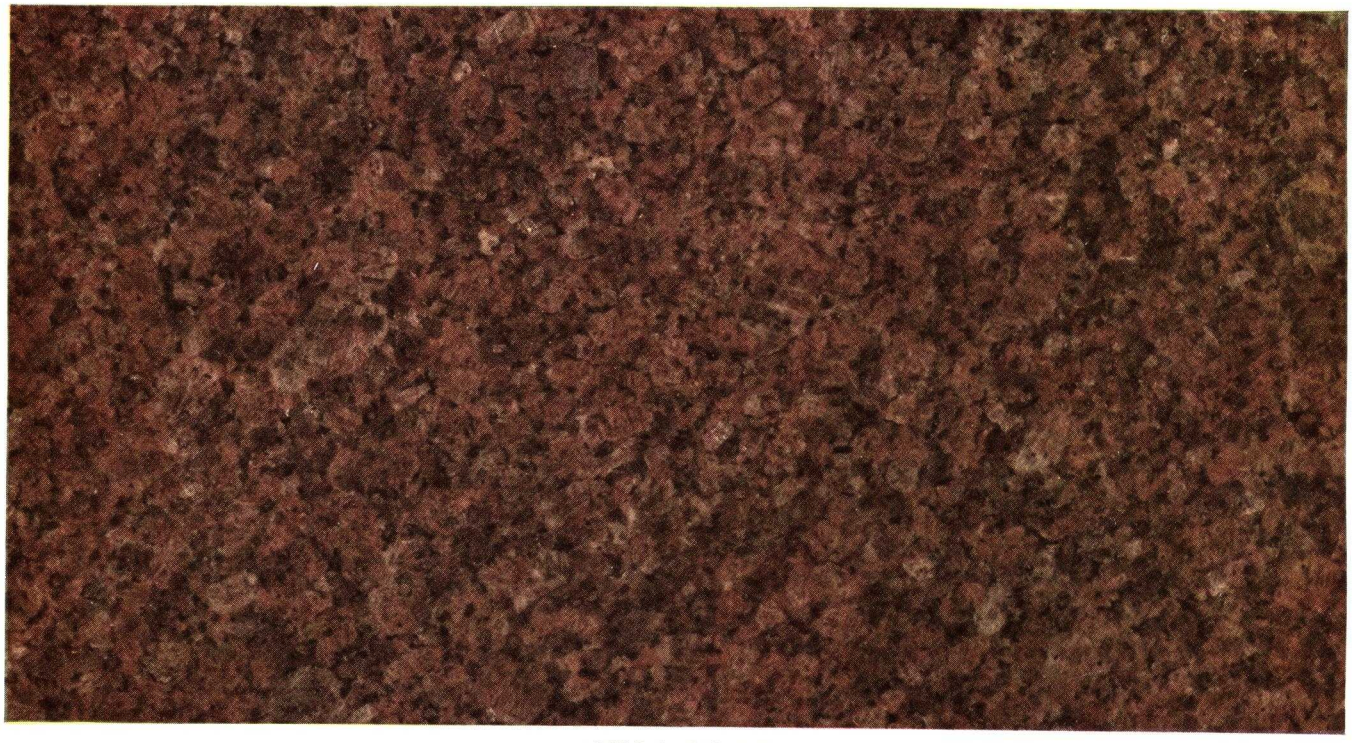
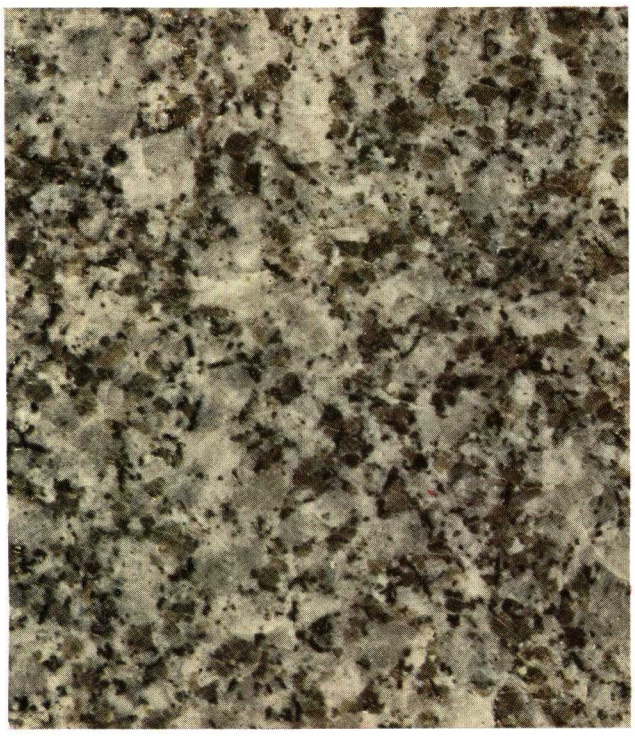


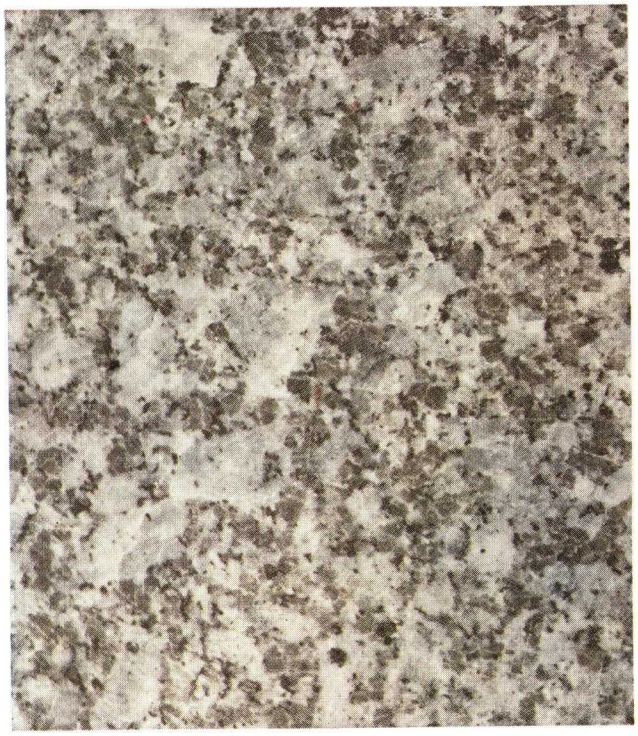
Cold Spring Ruby Red
Polished Finish

Cold Spring Veined Ebony Black Granite
Polished Finish

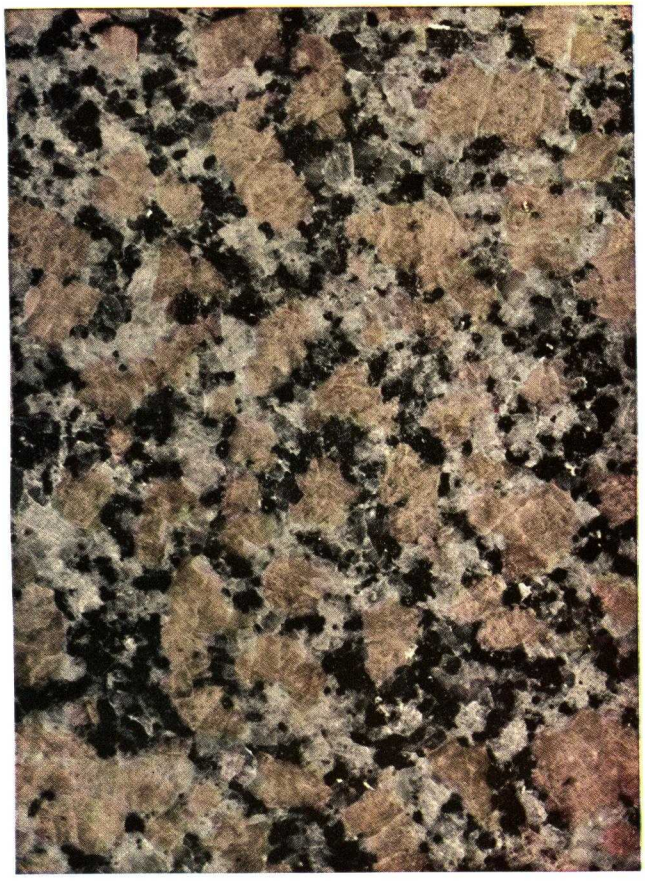
PRODUCED ONLY BY COLD SPRING GRANITE COMPANY, COLD SPRING, MINN.



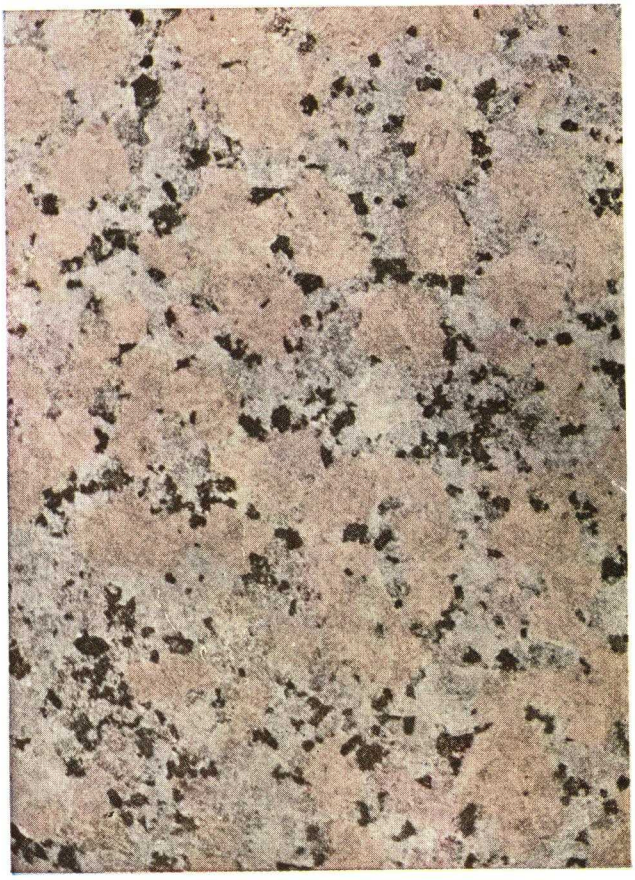
Cold Spring Pearl White Granite
Polished Finish



Cold Spring Pearl White Granite
Fine Rubbed Finish



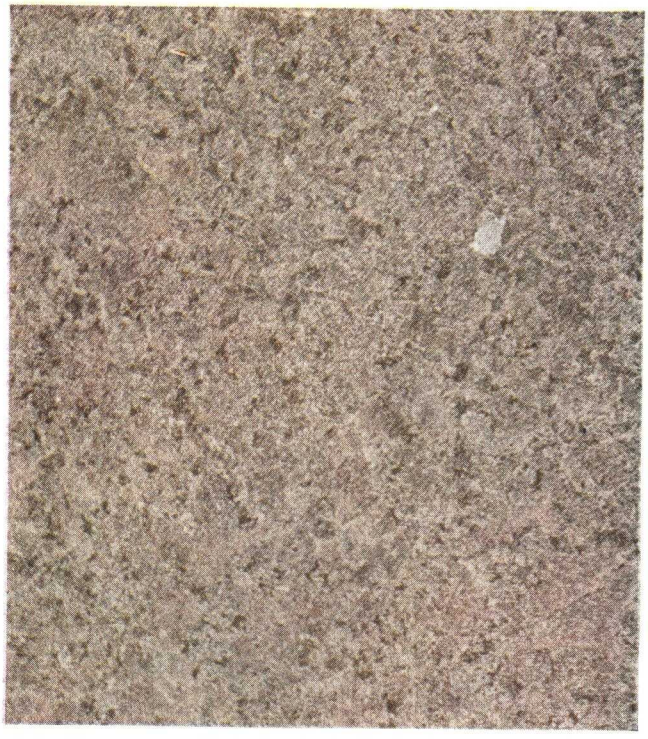
Cold Spring Pearl Pink Granite
Polished Finish



Cold Spring Pearl Pink Granite
Rubbed Finish

PRODUCED ONLY BY COLD SPRING GRANITE COMPANY, COLD SPRING, MINN.

Cold Spring Carnelian Granite
Polished Finish



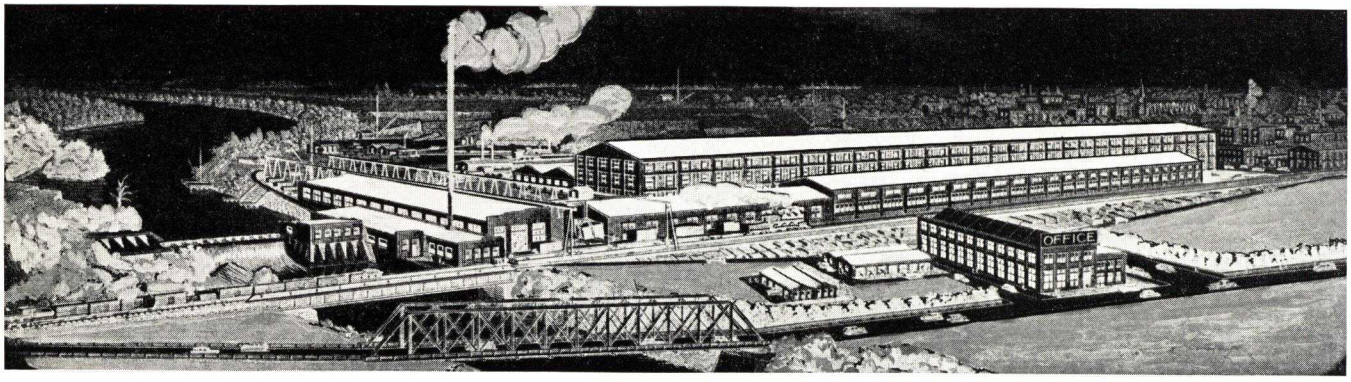
Cold Spring Carnelian Granite
Rubbed Finish

SERVICE

Because of continuous demand for THIN, POLISHED GRANITE we warehouse a complete supply at Cold Spring. Shipment to you can be made within a few days after receipt of working information. We realize the importance of opening dates and construction schedules. Our large staff of draftsmen and production men will quickly and accurately interpret your specific requirements on all granite jobs. They will collaborate with you in the development of details. Our quarries and plant operate on full time schedules the year 'round. There is no interruption or curtailment of service at any season of the year.

By obtaining a quotation on work you contemplate you will more fully understand the economic advantages of THIN, POLISHED GRANITE. We invite your inquiries. Please remember that first cost is final cost for the life of the building; that granite attracts finer tenants and increases the favorable ratio between investment and property income. Installation is simple and inexpensive.

Architects and contractors will find us responsive to all inquiries concerning the economical use of our products. Preliminary estimates will be furnished immediately upon request.



PRODUCED ONLY BY COLD SPRING GRANITE COMPANY, COLD SPRING, MINN.

H. E. FLETCHER COMPANY

Producers and Fabricators of Granite

WEST CHELMSFORD, MASS.

AGENTS

NEW YORK, N. Y.
J. W. Dutton, 110 E. 23rd Street

PHILADELPHIA, PA.
Gavin W. Muir, Architects Building

PRODUCERS OF

CHELMSFORD WHITE
CHELMSFORD GRAY
CHELMSFORD BULFINCH
MILFORD (N. H.) GRAY
MILFORD (MASS.) PINK

FABRICATORS OF

DEER ISLAND PINK
MILFORD PINK
SOMES SOUND, AND
ANY OTHER AVAILABLE GRANITES

QUARRY FACILITIES

Fifty years of quarry development have produced quarry faces containing millions of feet of granite, available for immediate quarrying under numerous derricks. New quarry methods eliminate high explosives which cause wasteful production.

FABRICATION FACILITIES

Gang Saws, Circular Shot Saws, Carborundum Saws, Polishing Wheels, Sand Blasts, Surfacing Machines.

With this extensive machinery and modern equipment we can produce any finish or texture on granite.

INSTALLATIONS

Building	Location	Architect or Engineer
The Apex Building	Washington, D. C.	Bennett, Parsons and Frost, Architects
District Police Court Building	Washington, D. C.	Nathan C. Wyeth, District Architect
Federal Reserve Board Building	Washington, D. C.	Paul P. Cret, Architect
New Building for Department of Interior	Washington, D. C.	Treasury Department Procurement Div. Waddy B. Wood, Architect
Archives Building	Washington, D. C.	John Russell Pope
P. O. Department Building	Washington, D. C.	Delano & Aldrich
U. S. Supreme Court Building	Washington, D. C.	Cass Gilbert, Jr. & J. R. Rockart, Cass Gilbert
New Jersey State Office Buildings	Trenton, N. J.	J. Osborne Hunt and Hugh A. Kelly
Pennsylvania State Capitol, West Approach, North Office Building, South Office Building No. 2	Harrisburg, Pa.	Gehron & Ross
The Sailors and Soldiers Memorial Bridge	Harrisburg, Pa.	Gehron & Ross and J. E. Greiner Co., Engineers
New York State Office Building, Park Work	Albany, N. Y.	State Architect Wm. E. Hougaard
Massachusetts State House Wings	Boston, Mass.	R. Clipston Sturgis
Federal Reserve Bank	Boston, Mass.	R. Clipston Sturgis
Shawmut National Bank Addition	Boston, Mass.	Parker, Thomas & Rice
Hartford County Courthouse	Hartford, Conn.	Paul P. Cret and Smith & Bassette, Assoc.
Camden County Courthouse and Camden City Hall	Camden, N. J.	Edwards & Green
Boston Post Office	Boston, Mass.	Cram & Ferguson
Lowell Post Office	Lowell, Mass.	Supervising Architect of the Treasury
Thirty Columns in Facade, Treasury Building	Washington, D. C.	Supervising Architect of the Treasury
New Orleans Post Office	New Orleans, La.	Supervising Architect of the Treasury
Cambridge Post Office	Cambridge, Mass.	J. D. Leland Co. and Charles R. Grecco
Fidelity Mutual Life Insurance Co., Building	Philadelphia, Pa.	Zantzinger, Borie & Medary
Lehman Hall, Harvard University	Cambridge, Mass.	Coolidge, Shepley, Bulfinch & Abbott
St. Louis Masonic Temple	St. Louis, Mo.	Eames & Young, Albert B. Groves, Assoc.
Metropolitan District Commission Building	Boston, Mass.	Densmore, LeClear & Robbins
Olin Memorial Library	Middletown, Conn.	McKim, Meade & White
Philadelphia-Camden Bridge	Philadelphia, Pa.	Paul P. Cret, and R. Modjeski, Engr.
Worlds Fair Bridges 1 and 2	New York, N. Y.	Aymar Embury, 2nd, Architect
Goethals Memorial Bridge	New York, N. Y.	York & Sawyer, N. Y. Port Authority
Kill Van Kull Bridge	New York, N. Y.	Cass Gilbert, Inc., N. Y. Port Authority
Ridge Road Bridge	Rochester, N. Y.	Gehron & Ross and Frank McKibben, Engr.

JOHN L. GOSS CORPORATION

Producers of "Goss Pink Deer Isle Granite"

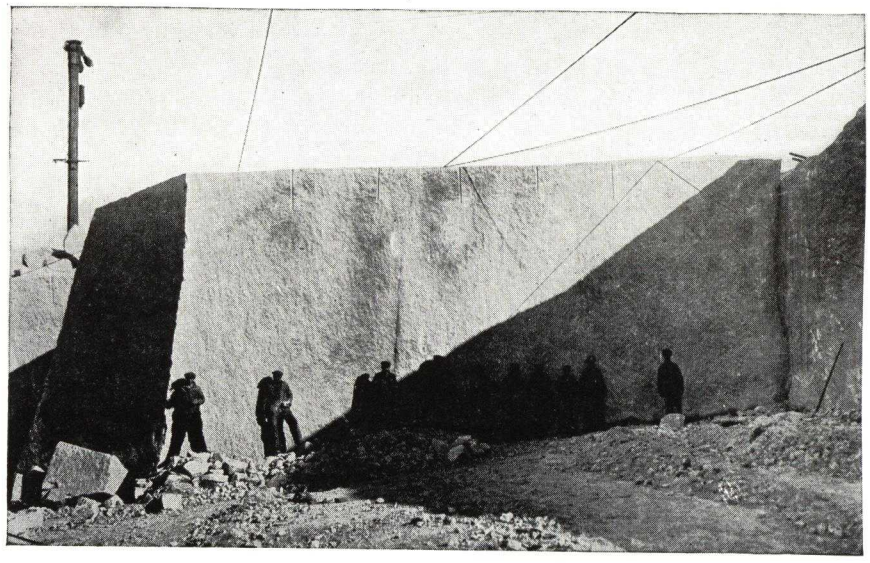
QUARRIES AND HOME OFFICE
STONINGTON, MAINE
SALES OFFICE, 77 Summer Street, BOSTON, MASS.
SALES AGENTS
NEW YORK, N. Y., A. LePoidevin & Co., Inc., 286 Fifth Avenue
PHILADELPHIA, PA., Frank Williamson, 2302 Spruce Street
LOS ANGELES, CAL., Victor Granite Co., 5975 Santa Monica Boulevard

GOSS PINK DEER ISLE GRANITE

A Standard and Universally Distributed Granite for Building and General Purposes

Color and Texture

Goss Pink Deer Isle Granite is a sound, hard and non-absorbent natural granite produced in large quantities, and available in any sizes, at a moderate cost. Rough granite is widely distributed among dealers and manufacturers, many of whom carry it in stock to enable them to give better deliveries. The color of the material is a warm lavender-pink, mixed with gray. It is medium to coarse grained, and of strong character. It harmonizes well with other standard building materials, as brick, limestone and bronze.



A 2000-ton Block of Goss Pink Deer Isle Granite Ready to be Cut up for Shipment

STANDARD FINISHES

Finish	Characteristics	Where Used
Polished	High gloss, keeps clean, brings out color, resulting in darker tone	Base courses. Lower stories
Honed	Dull gloss, smooth surface	Same as above
Rubbed	Smooth surface without gloss. Same shade as natural granite. A special finish	Carving in connection with polished work, and for smooth texture without gloss or change of color
8-cut (Bush Hammered)	Uniformly corrugated by fine tool marks, gives appearance of lighter color than the unfinished granite.	High class general building work close to the eye—entrances, fine moulded details
6-cut	Similar to above but coarser	General building work, first stories, risers of steps
4-cut	Similar to 6-cut but coarser texture	General building work, steps, curb, upper stories
Pointed, fine, medium or coarse	Pebbled or stippled effect. Coarse pointed is an economical finish for large surfaces	Platforms, treads and where strong texture is wanted. Trim of bridges
Rockface	Bold, irregular, natural surface. Least expensive finish for heavy work	Bridges, retaining walls, armories or for rugged effect
Sawed	Fairly smooth plane surface, with marks of shot at irregular intervals. Rusty stain may occur and special treatment is necessary if this is objectionable	Steps, platforms and thin ashlar

References

Building	Architect
Stevens Hotel, Chicago, Ill.	Holabird & Roche
Federal Reserve Bank, Boston, Mass.	R. Clipston Sturgis
Lafayette Building, Philadelphia, Pa.	John T. Windrim
Evans Memorial Galleries, Boston, Mass.	Guy Lowell
Insurance Co., of North America Building, Philadelphia, Pa.	Stewardson & Page
Neils Esperson Building, Houston, Tex.	Eberson & Eberson
Southern California Edison Building, Los Angeles, Cal.	Allison & Allison
Security Trust & Savings Bank, Los Angeles, Cal.	John Parkinson
Public Ledger Building, Philadelphia, Pa.	Horace Trumbauer
East Boston (Mass.) Savings Bank	Thomas James
Pilgrim Memorial Tower, Provincetown, Mass.	Willard T. Sears
South Office Building, State Capitol, Harrisburg, Pa.	Arnold W. Brunner
Merchants National Bank, New Bedford, Mass.	Adden & Parker
Pioneer Monument, Harrodsburg, Ky.	Francis Keally
Industrial Trust Building, Providence, R. I.	Walker & Gillette
Security Building, Miami, Fla.	Robert Greenfield
New York State Office Building, Albany, N. Y.	Sullivan W. Jones
Salem Fields Entrance, Brooklyn, N. Y.	Percy W. Darbyshire
Fountain of Oceanus, Estate of John D. Rockefeller, Pocantico Hills, N. Y.	Welles Bosworth
Drexel Bank Building, Philadelphia, Pa.	Day & Klauder
Mutual Trust Co., Philadelphia, Pa.	Heacock & Hokanson and The Ballinger Co.
New York State Office Building, New York, N. Y.	Sullivan W. Jones William E. Haugaard
Fountain Memorial to Pilgrim Women, Plymouth, Mass.	McKim, Mead & White
Pennsylvania R.R. Station, Philadelphia, Pa.	Graham, Anderson, Probst & White
New York Historical Society, New York, N. Y.	Walker & Gillette
Post Office Department Building, Washington, D. C.	Delano & Aldrich
Internal Revenue Building, Washington, D.C.	J. A. Wetmore

GRANITE ASSOCIATION

5619 Grand Central Terminal Building

NEW YORK, N. Y.

TELEPHONE: MUrray Hill 9-2465

THE MATERIAL

Granite's unchallenged qualities as a high grade building material are known to every architect and engineer. However, most of the users of granite are not familiar with the latest technological developments in quarrying and processing and their consequent reduction in cost.

Hardly any other material in the building field is more affected in cost by the method of detailing than granite. The Architect or Engineer who strives for economy and an adequate adaptation of the material in his design, should consult the granite manufacturer or his association. With this co-operation, there is an opportunity to use granite where otherwise less satisfactory materials might have to be used.

1938 HANDBOOK

The Association informs you that new copies of the 1938 handbook are available at its office and will be mailed to anyone requesting same. This handbook contains extensive information in regard to granite, such as points which should be covered in writing specifications, color specifications, surface finishes, photographs showing standard finishes, detailing for granite and general information in regard to processing.

LIST OF MEMBERS

DEER ISLAND GRANITE CORPORATION
5617 Grand Central Terminal Building, New York, N. Y.

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77 Summer Street, Boston, Mass.
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Frank Williamson, 2302 Spruce Street, Philadelphia, Pa.
Bly Stone Co., 1985 East 16th Street, Los Angeles, Calif.

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H. B. Whitehead, 101 Park Avenue, New York, N. Y.

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Representatives:
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James J. Miller, 1822 Bolton Street, Baltimore, Md.
A. M. Goldsmith, 1937 Grand Central Terminal Building, New York, N. Y.

ROLLSTONE GRANITE SALES, INC.
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Representatives:
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Exum M. Hass, 2192 Taylor Road, East Cleveland, Ohio

THE NORTH CAROLINA GRANITE CORPORATION

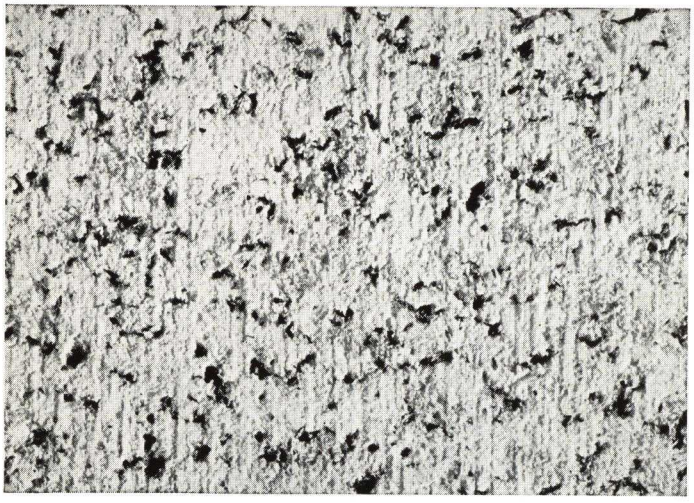
MEMBER OF NATIONAL BUILDING GRANITE QUARRIES ASSOCIATION

MOUNT AIRY, N. C.

BRANCH OFFICES

CHICAGO, ILL., 127 No. Dearborn St. NEW YORK, N. Y., 1937 Grand Central Terminal PHILADELPHIA, PA., 1001 Witherspoon Bldg.

CUTSTONE DEPARTMENT: J. D. Sargent Granite Company, MOUNT AIRY, N. C.



The Granite of Individuality
(Full Size)

Products

DIMENSION GRANITE for Buildings, Mausoleums, Monuments, Bridges, Dry Docks, etc.

Also Polished and Turned Granite; Granite Paving Blocks, Street Curbing, Crosswalk, Rubble Ashlar, Building Blocks, Crushed Granite and Rip Rap.

Estimates, Samples and Service for Architects

A complete organization is maintained to cooperate with the Architect or Contractor. Preliminary estimates and samples promptly furnished without obligation. Experienced and practical stone men are available to give promptly and efficiently valuable advice and recommendations as to grade, style of finish, setting plans, detail and the latest technological developments of processing.

MOUNT AIRY GRANITE

"White Mount Airy" Granite is of medium grain and of uniform color and texture. This granite has dignity and beauty, imparting an appearance of decided strong character, making it particularly adaptable for the finer types of construction, especially where it is desired to give the connotations of character, integrity, durability, and permanence.

Mount Airy Granite has long been recognized as the ideal American granite for private mausoleums. It has been the choice for outstanding private and public monuments; public, institutional and commercial buildings, banks, churches, schools and bridges.

Physical and Chemical Description

The character of Mount Airy Granite comes from its physical structure. It is a biotite granite of medium texture. Feldspar, quartz, and mica characterize the granite megascopically. The feldspar is nearly white, the quartz a blue gray and the mica black and very evenly distributed. State Geological Survey chemical analysis shows:

SiO_2	70.70
Al_2O_3	16.50
Fe_2O_3	2.34
MgO	0.29
CaO	2.96
Na_2O	4.56
K_2O	2.45
FeS_2	0.09
Total	99.89

Weight per cu. ft.	.165 lbs.
Water absorbed per cu. ft.	0.33 lbs.

Crushing strength, .23,068 lbs. per sq. in.

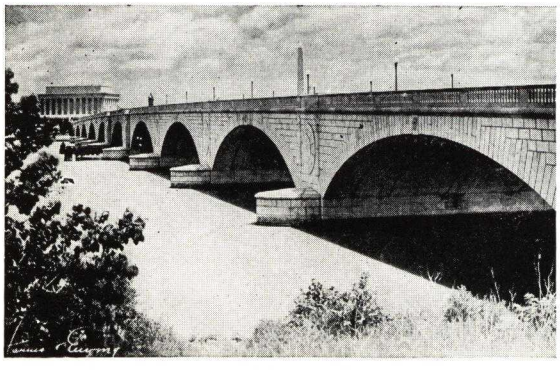
Facilities and Economical Materials

Mount Airy Quarries are economically run with modern and complete equipment. Electric traveling cranes, polishing machinery and turning lathes, sandblast and carborundum machines, gang saws and compressed air driven tools are used to meet modern competition efficiently and turn out large contracts free from defects, in quick time, on schedule.

Building and bridge jobs are handled efficiently and without mistakes by our drafting department and finishing plants. Mount Airy Granite may be obtained in blocks up to the limits of railroad transportation. 1 & 2 Man Rubble, Sawed Bed Ashlar, Broken Range Ashlar are economical Mount Airy materials and merit careful consideration.

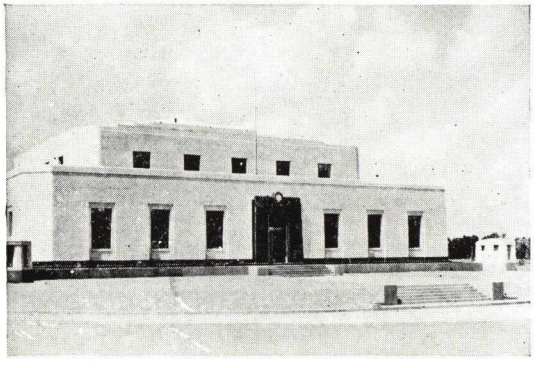
Mt. Airy Granite for Permanence and Beauty

Wright Brothers Memorial, Kitty Hawk, N. C.
Union Trust Building, Washington, D. C.
New State Office Building, Raleigh, N. C.
Delaware River Bridge, Philadelphia, Pa.
Patterson Monument, Dayton, Ohio
Pennsylvania State Monument, Gettysburg, Pa.
O'Brien Mausoleum, Cincinnati, Ohio
Dodge Mausoleum, Detroit, Mich.
Rose Hill Mausoleum, Chicago, Ill.
St. Charles Borromeo Seminary, Overbrook, Pa.



Arlington Memorial Bridge, Washington, D. C.

Keystone for Bridge



U. S. Bullion Depository, Fort Knox, Ky.

ESTABLISHED 1837

SULLIVAN GRANITE COMPANY

INCORPORATED 1907

Sole Producers of Extra Fine Grained Blue-White Westerly Granite
Known as Sullivan-Westerly Granite

WESTERLY, R. I.

SULLIVAN-WESTERLY GRANITE

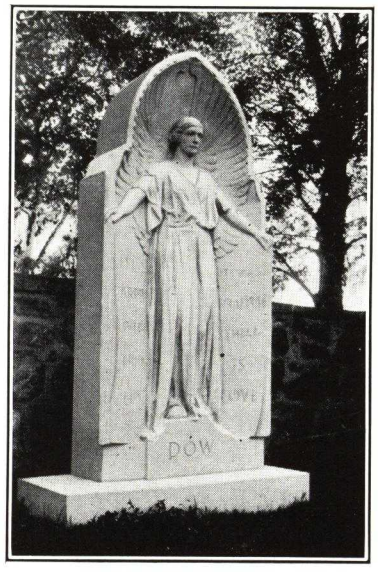
One Quality—One Price—One Name—Always the Same

The Extra Fine Grained Blue-White Westerly Granite is used for Mausoleums, Monuments, Statues and other Memorials. Trade name SULLIVAN-WESTERLY GRANITE.

CHARACTER OF GRANITE

All the Westerly Granite known as Extra Fine Grained Blue-White Westerly Granite is quarried by the SULLIVAN GRANITE COMPANY. This Granite is uniform in color, white when hammered, and very fine grained and exceedingly hard. Because of its especially fine grain this granite is particularly suited for memorial purposes. Its hardness and clear light color give effective definition to the most delicate details of ornament. When polished it is a bright blue color.

Sullivan-Westerly Granite, quarried since 1837, has been proved absolutely dependable in every respect. It has long been acknowledged the best of memorial granites.



Dow Memorial

ONE GRADE ONLY

Only one grade of Sullivan-Westerly Granite, of unvarying fine quality, is sold; at one standard price. When you specify Sullivan-Westerly Granite for a memorial, you are sure to get perfect granite as only one grade, the best, is used for monumental work.

LARGEST BLOCKS AVAILABLE

Every modern device for quarrying and handling granite in all sizes is used by the SULLIVAN GRANITE COMPANY. This makes it possible to fulfill large contracts promptly and satisfactorily. Some of the largest granite blocks ever produced have been shipped from these quarries.

Our tracks are connected with the main line of the New York, New Haven & Hartford Railroad. 85 miles to Boston, 143 miles to New York.

SERVICE

Architects and other users of granite are invited to visit our quarries at any time.

Prompt attention is given to requests by mail for information or estimates. Samples are willingly furnished upon request.

LONG LIFE TERRAZZO FLOORS

Westerly granite granules are the best adapted for terrazzo work where long wear and beauty of color is desired.

Our granite has a crushing strength of 29,500 pounds per square inch.

At the same time it machine rubs well and can be used with marble, thus giving longer life to such floors, or it can be used by itself, as desired by the architect.

Prepared in sizes 1, 2 and 3 and in colors from blue to pink.

Particularly adapted for floors subject to trucking or other hard wear.

Our waste is sold as Crushed Stone, screened to any size, also as Rip Rap. Send for prices.

APPALACHIAN MARBLE COMPANY, INC.

Quarriers and Manufacturers of Appalachian Tennessee Marble
Manufacturers of Foreign and Domestic Marble
KNOXVILLE, TENN.
NEW YORK OFFICE: 17 West 45th Street

THE COMPANY, ITS SERVICES AND FACILITIES

Products

APPALACHIAN TENNESSEE MARBLE produced and finished for interior and exterior applications.

Foreign and other domestic marble also manufactured. Our connection with foreign quarries allow us to manufacture practically any desired imported marble at a decided cost saving.

The Company

The APPALACHIAN MARBLE COMPANY, INC., has manufactured marble for 25 years, and annually sells more than $1,000,000 of Appalachian Marble to England, Canada, Cuba, Latin America and every state in the Union.

The Company is located in the heart of a marble district in which it is possible to employ unusually skilled marble workers, some of them the third and fourth generation in this business.

Such experience combined with modern mills and almost inexhaustible supply of marble in the quarries assure the architect and owner the best of service and workmanship. The quarry capacity is in excess of the milling capacity and all quarry waste is turned into lime. Since there is absolutely no non-productive waste from either the mill or quarry, the costs of Appalachian Marble make it available for a wide range of uses described later herein.

The Mills turn out approximately 25% of the finished Tennessee Marble manufactured in the Knoxville District. It has 36 gang saws, 10 rubbing beds and twice as much finishing machinery including planers, lathes and carborundum machines as is actually required for sawing capacity, so as to take care of all orders for marble promptly and rapidly. The mills have two units, each an independent plant, and duplicate equipment throughout, so as to guard against delays which might be caused through any breakdown.

Cost Estimates and Cooperative Service

Upon receipt of plans and specifications, a cost estimate will be cheerfully prepared and submitted on all inquiries. We also furnish information and render service to architects, owners and contractors when called on.

We contract either for interior marble installed in building or finished and furnished to local marble dealer as the situation may justify.

Frequently engineering problems arise in connection with the purchase, use or installation of interior marble. Often these problems require the study of an engineer who has been especially trained in the interior marble field.

The Service Department of the APPALACHIAN MARBLE COMPANY, INC., is always at your right hand in cases of this kind, willing, even anxious, to help in the solution of the problem. We also maintain a similar department in New York City for the benefit of local architects who require assistance of this character. There is no charge for this service, of course, whether Appalachian Marble has been specified on the job in question or not.

Marble Working Drawings

Complete marble working drawings are made up by our drafting department to be used in submitting to the architects for approval as to jointing and for the securing of accurate Field Measurements.

Samples

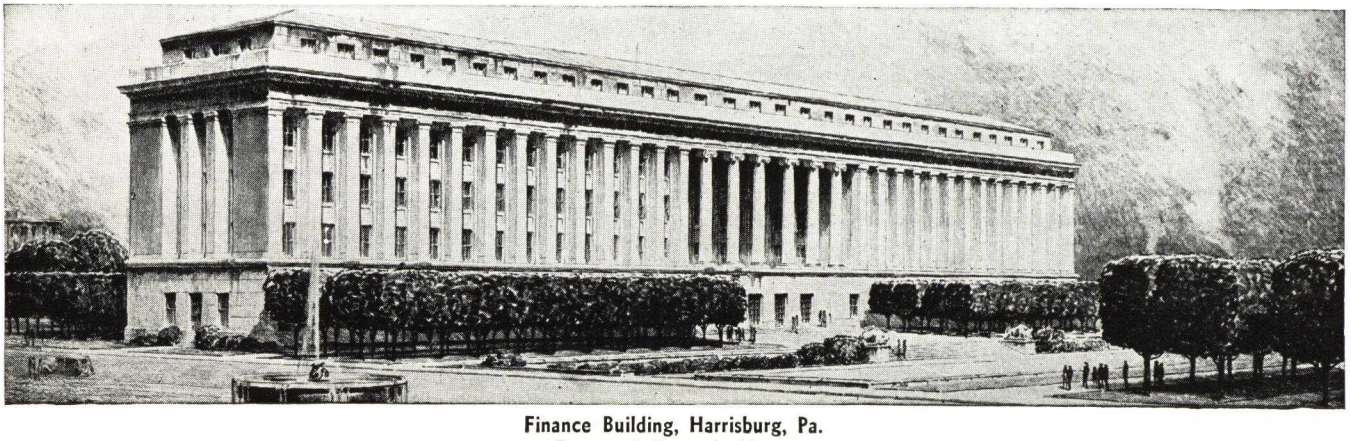
Polished or honed samples, showing the beauty of the Appalachian Marble, will be sent to any interested architect or contractor, upon request.

Delivery Service

Huge production facilities and entire absence of labor troubles insure quick deliveries. Freight rates on marble from the Appalachian mill are estimated at commodity rates to all points in the United States and Canada.

Catalog

A copy of the loose-leaf Appalachian catalog, illustrated in colors, will be sent to architects and others interested in Appalachian products.



Finance Building, Harrisburg, Pa.
GEHRON & ROSS, Architects

VARIETIES OF APPALACHIAN MARBLE

The colors and shades of Appalachian Tennessee Marbles include light or medium gray; light, medium to deep pink; mixed gray and reddish or pinkish, dark reddish to purplish and transitions from the deep pink to the chocolate colored. Within this wide range, the architect and owner will nearly always be able to find exactly the marble to achieve the effect desired. Below we describe some of the Appalachian Marbles, but it is impossible to appreciate the colors and markings without samples promptly furnished on request.

Appalachian Roseal

A decorative marble with strong rich veining, rich and warm in coloring giving a mottled Persian effect with a predominately pink tone. Especially suitable for unusual interior treatments or for interior trim in combination with other colors to produce a striking and beautiful result. Used also extensively for corridor and lobby wall lining.

Appalachian Golden Vein

This marble is an exclusive Appalachian product. No other marble quarried resembles it. Above all others it is capable of imparting to an interior an effect of richness and warmth. It is a soft gray with a pinkish tone giving almost a golden color. Veins of a deeper shade accent the beauty. Ideal for mausoleum interiors.

Appalachian Silver Gray

This is the lightest gray marble quarried in Tennessee and is preferred by many architects to the finest imported white marbles. This preference is based on the warm delicate coloring and considerably lower price. Hard and stain resisting.

Appalachian Champion Pink

A warm pink marble with deep rich veining which brings out the delicate pink tones by strong contrast. This marble has been very popular with architects and has been used in some of America's finest buildings to create an atmosphere of warmth and add vitality to the color scheme.

Bond Pink

Used extensively for toilet and shower room marble. Sound and of pleasing appearance.

Appalachian Dark Chocolate and Dark Cedar

Used principally for interior trim because of its deep brown coloring this marble is used to bring out in bold contrast the lighter marbles used with it. Ideal for base, plinths, window sills and trim.

Appalachian Fleuri

One of the newest Tennessee Marbles of rich brown, red and white background. Fantastic markings suitable for theater and high-class store interiors, fireplace facings and fancy panels.

Other Appalachian Marbles

In addition to those described above we also manufacture the following: Appalachian Tavernelle, Appalachian Rose Tavernelle, Appalachian Platinum Gray and Appalachian Fossil, and a number of others.

Typical Characteristics of Appalachian Marble

Appalachian Marbles are Class A rating, requiring no sticking or waxing; they take a high and permanent polish. They are non-absorbing, strong and easily worked.

Co-efficient of absorption
Average ..... .047

Tensile strength (transverse to bed)
Average .....1,554 lbs. per sq. in.

Tensile strength (with bed)
Average .....1,551 lbs. per sq. in.

Transverse strength (modulus of rupture)
Average .....2,686 lbs. per sq. in.

Compressive strength
Average .....18,274 lbs. per sq. in.

These tests made by U. S. Bureau of Standards and reported by T. Nelson Dale, Retired Geologist, U. S. Geological Survey.

United Illuminating Company, Bridgeport, Conn.
Appalachian American Pink
Veneer used on this modern building

TYPICAL APPLICATIONS OF APPALACHIAN MARBLE

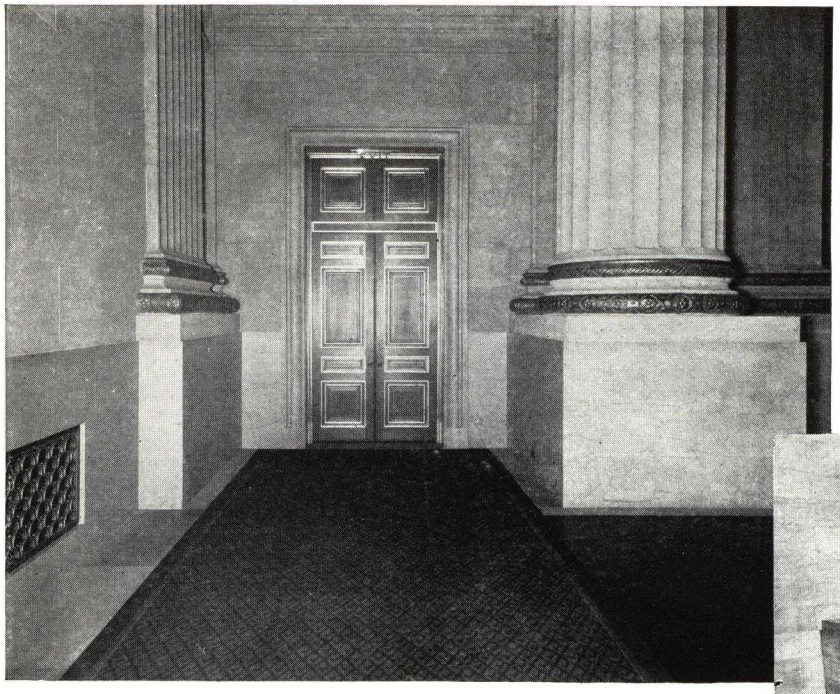
Because of its strength, non-absorption, resistance to stains and abrasion and other characteristics as described on the preceding page, Appalachian Marble finds a wide range of application on both exterior and interior of all types of buildings. Some of the more common of these are outlined below.

Wainscoting and Trim

Probably the use of marble which is most familiar to the layman is for wainscoting in corridors of office buildings and the interior of banks and similar institutions where the effect of richness and dignity is important. The wide range of colors of Appalachian Marble lend themselves to all types of buildings for decorative purposes.

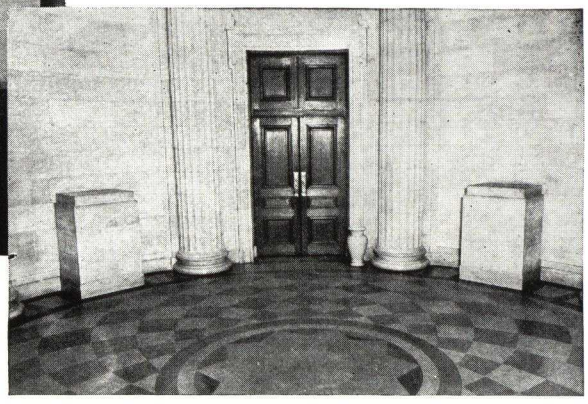
Marble for Toilet and Shower Stalls

Marble is being specified and used over other materials in many large public buildings and similar applications because of its moisture resistance. Furthermore the cost of maintenance is practically eliminated as no refinishing is necessary and, in the long run, it is actually cheaper in cost than other materials.



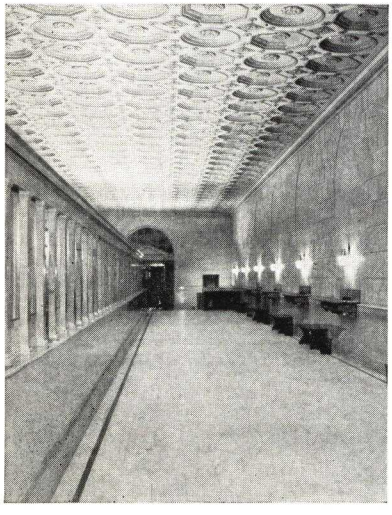
Left:

Two Views of the I.C.C. and Labor Building, Washington, D. C.
ARTHUR BROWN, Architect
Bases, stairs and floors of Appalachian Marble



Below:

Park National Bank, Knoxville, Tenn.
Walls and floors of Appalachian Marble



Right:

Presbyterian Hospital, Pittsburgh, Pa.
Lobby—Appalachian Golden Vein Marble

MARBLE IN THE MODERN HOME

The use of marble in and around the modern home is no longer considered a luxury since the development of modern machinery reduces the cost of manufacture to a point which makes marble entirely practical for every residence. The APPALACHIAN MARBLE COMPANY, INC. now offers genuine marble tile as well as marble slabs for many home applications as described below.

Tile and slabs are ¾ to 1½ in. thick, cut to standard shape and size, or special sizes the architect may desire for exactly carrying out his ideas.

These can be obtained in any of our Appalachian Marbles enabling the architect and owner to have the natural beauty and permanency of marble at greatly reduced cost.

Exterior Marble Ashlar in the Modern Manner

Exterior Wall Ashlar

Appalachian Marble Ashlar, either hone or sand finish, can be furnished in standard sizes at prices which make marble ashlar available for the comparatively moderately priced home as well as for more pretentious structures.

Marble Veneer

Frequently used for the refacing of old buildings which have become unsightly and need remodeling. Can be installed without the necessity of tearing down old walls. Used in thicknesses of 1 to 2 in. Costs little more than a good grade of brick.

Floor Tile and Stair Treads

Appalachian Tennessee Floor Tile comes in 8 x 16 ins., 10 x 20 ins. and 12 ins. square, standard sizes. It can also be obtained in special sizes and in a wide variety of beautiful colorings.

Appalachian Floors and Treads are low in initial cost, low in maintenance cost and last the life of the building. They are easy and economical to keep clean, materially reduce the dust nuisance and make for better health. They subdue traffic noise and afford a safe, comfortable walking surface.

The 8 x 16 and 10 x 20-in. tile are always on hand, and shipment can be made on receipt of order.

Fireplace Facings

There is no other item in the interior features of domestic architecture that plays such an important part as the fireplace and its mantel. Marble has unlimited possibilities in this connection and lends dignity and warmth not obtainable in other materials.

Appalachian Marble can be furnished in many colors and shades to suit individual tastes and color schemes.

Sun Room Floors

Entrance halls and sun rooms are made cool and attractive by the use of Appalachian Tennessee Marble Floor Tile and Base.

The characteristic density of Appalachian Tennessee Marble makes it impervious to all ordinary stains and easy to maintain in its original beautiful condition. An occasional mopping with cold water is all that is necessary for its upkeep.

The neutral background of Appalachian Tennessee Marble Floors will blend with any decorative scheme, while its delicate colors and veining escapes monotony.

Marble Tile for Walls and Floors

Genuine Appalachian Marble may now be used for floors and walls in the modern bath, as well as marble stools for radiator tops.

The tiles are ⅜ to ½ in. thick, cut to standard shape and sizes.

Marble Tile are classified and specified under "Tile Work" to be set by the Tile Contractor, using either the floating or buttering method.

Appalachian Marble Tiling is naturally free from cracks, chipping and crazing, and, most important, it remains fast in color.

Being light in weight, it does not require special support or backing.

Floor Tile and Stair Treads

Flagstones

For sun rooms, terraces, garden walks and stepping stones. Can be laid in distinctive and exclusive design, in shapes just as taken from our yard.

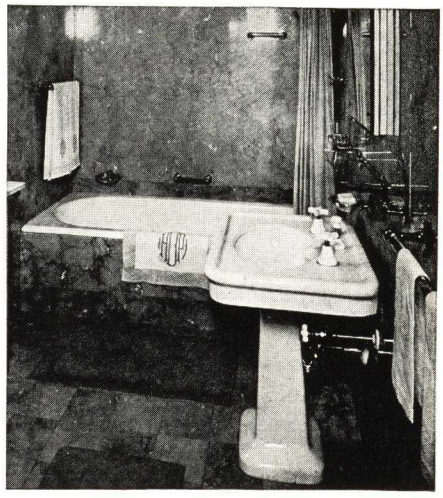
To meet the increasing demand for such uses of Tennessee Flagstones, we have provided large storage facilities and can give immediate delivery. We have on hand a large amount of flagstones, which, when laid in random shapes as taken from our yard, make attractive garden walks, terrace floors, etc.

A Few Recent Installations

Carnegie Institute, Washington, D. C.
Delano & Aldrich, Architects

Sunbury Mausoleum, Sunbury, Pa.
James W. Minick, Architect

Morris Hill Mausoleum, Boise, Ida.
Tourtellotte & Hummel, Architects



Floors and Walks of Bathrooms

CARTHAGE MARBLE CORPORATION

Producers of Interior and Exterior Marbles
Fabricators of All Foreign and Domestic Marbles

QUARRIES AND MILLS
CARTHAGE, MO.

BRANCH SALES OFFICES

NEW YORK, N. Y., Alexander Thomson & Co. CHICAGO, ILL., John W. Sinding SAN FRANCISCO, CALIF., John M. Fabbris

CARTHAGE MARBLE—DESCRIPTION

CHARACTERISTICS—Carthage Marble is one of the densest, hardest, and fine grained of the native American marbles admirably adapted to both interior and exterior use.

COLOR—The color is a uniform, light warm-gray.

NON-ABSORBENT—It is so dense and close grained that it has an exceedingly low absorption factor. (less than ½ of 1%). It is for this reason ideal for toilet and wash room wainscoting and stalls. Years of such use show no unsanitary absorption stains.

NON-ABRASIVE—Where used for floors under heavy traffic conditions, it shows little or no wear and cleans perfectly with ordinary mopping. Carthage Marble has an abrasive hardness of 17.

FINISHES—For interior standing trim, it takes a high, permanent gloss finish; for floors and exteriors a hone or rubbed finish is ideal.

ADAPTABILITY AND ACCEPTANCE—Carthage Marble has been successfully used in outstanding public and commercial buildings throughout the United States in corridors, elevator lobbies, toilets, and floors by our most discriminating architects. See partial list of installations.

QUARRYING AND FABRICATING FACILITIES—Carthage Marble Corporation is equipped to handle promptly jobs of any size. Facilities include 5 quarries, 15 channeling machines, 35 gang saws, 10 rubbing beds, 15 polishing machines, 7 carborundum planers, and 6 steel planers.

VARIETIES OF CARTHAGE MARBLE

OZARK TAVERNELLE—Ozark Tavernelle Marble has a soft light gray, clear face. Almost a monotone, it has a dignified effect of richness.

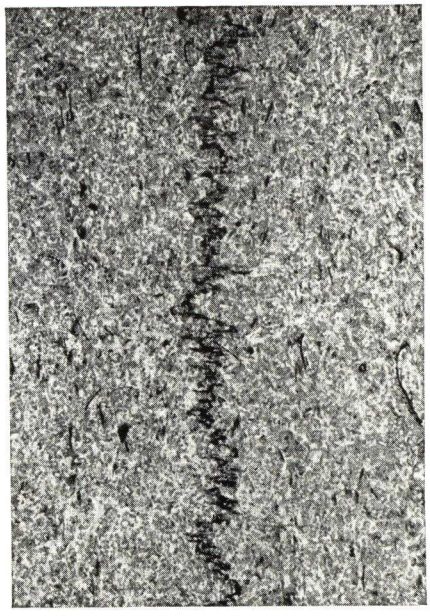
OZARK GRAY VEINED—Ozark Gray Veined Marble has the same texture as Tavernelle, but it is veined and slightly darker in color.

OZARK FLEURI—Ozark Fleuri has a soft, light background with a variation of darker cloudings on the face. Ideal where the architect desires a variegated effect.

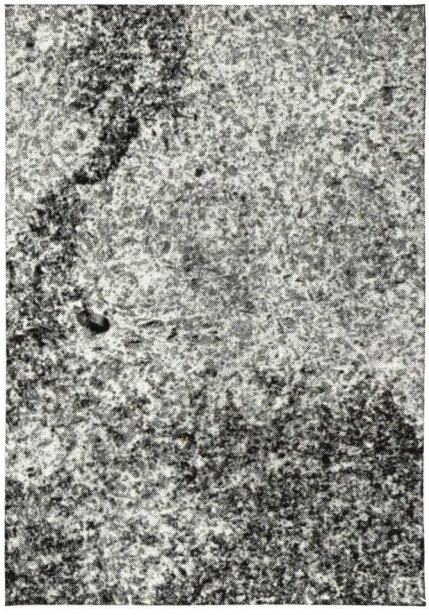
COMBINATIONS—In combinations, these three marbles can be adapted to the widest variety of designs. Their colors and textures form unusually happy blends.

EXTERIOR MARBLE—Carthage Exterior Marble is the ideal marble for exterior building. A warm gray, almost white, with a crushing strength of 20,000 pounds.

OZARK TAVERNELLE—ACTUAL SIZE



OZARK GRAY VEINED—ACTUAL SIZE



OZARK FLEURI—ACTUAL SIZE

SPECIFICATIONS FOR OZARK INTERIOR MARBLE

SPECIAL NOTE—The "General Conditions of the Contract," the "Special Conditions," and other documents bound herein, are a part of this specification and the Contractor shall consult them in detail for instructions pertaining to his work.

WORK REQUIRED—The work to be done under this contract includes the furnishing of all labor, materials, equipment, and services necessary for and properly incidental to the completion of all interior marble work throughout the building, as shown on the drawings and herein specified, excepting only work noted as being done by others.

DISTRIBUTION—All marble as shown on drawings shall be Ozark (specify variety) marble.

MARBLES—All marble used shall be sound and free from spalls, shakes, sand holes, or other defects that would impair its strength, durability, or appearance. Natural variations in color, texture, or markings that do not impair the strength or durability will be permissible. Any marble that is cracked or broken either before or after delivery at the building will be rejected.

Special care shall be taken in matching the color and figures throughout the entire installation.

DRAWINGS—Complete cutting and setting drawings shall be furnished by the Interior Marble Contractor showing the jointing as well as the size of all pieces and other necessary information. All dimensions must be verified at the building.

INSTALLATION—This Contractor shall set all marble work in the best possible manner. Only experienced and competent setters shall be employed and this Contractor shall do any trimming, fitting, etc., to overcome inaccuracies and to make the materials fit and conform to the conditions existing at the building and so as not to delay the work.

All vertical marble shall be securely anchored in place with copper or soft brass wire and bedded in plaster of paris.

The backs of all mullions for toilets and showers shall be slotted to receive the division and the end of the division shall be let into the recesses formed in the wainscoting for back lining.

All cutting shall be uniform, the edges being ground so that all joints can be brought as close as practical, and there shall be no change in the sections of offsets and similar details. All work shall be carefully fitted in the shop and precautions taken to prevent snipping or chipping of edges.

FINISHING—All exposed surfaces of marble shall be highly polished.

HARDWARE—This contractor shall drill all holes and install all hardware (furnished by the Finished Hardware Contractor) as hereinafter specified which is directly connected to the marble work.

The Marble Contractor shall furnish all angles, anchors, etc., necessary for the installation of the work in connection with toilet stalls.

PARTIAL LIST OF INSTALLATIONS

CITY HALL, KANSAS CITY, MO.
Ozark Gray Veined toilet rooms throughout
Architects: Wight & Wight, Kansas City, Mo.

U. S. POST OFFICE (Illustrated below), ST. LOUIS, MO.
Carthage Marble exterior
Architects: Klipstein & Rathmann, St. Louis, Mo.

U. S. FEDERAL COURTS, ST. LOUIS, MO.
Ozark Gray Veined Corridors, Ozark Tavernelle Toilets
Architects: Mauran, Russell & Crowell, St. Louis, Mo.

MUNICIPAL AUDITORIUM, KANSAS CITY, MO.
Ozark Tavernelle in toilet rooms throughout
Architects: Gentry, Voskamp & Neville, Kansas City, Mo.

MOUNT SAINT SCHOLASTICA CHAPEL, ATCHISON, KAN.
Carthage Marble Exterior
Architects: E. Brielmaier & Sons, Milwaukee, Wis.

NEWTON COUNTY COURT HOUSE, NEOSHO, MO.
Carthage Marble exterior, Ozark Gray Veined toilet rooms
Architect: Neal C. Davis, St. Louis, Mo.

CHRONIC DISEASE HOSPITALS, WELFARE ISLAND, N. Y.
Ozark Tavernelle and Ozark Gray Veined wainscots and toilet rooms
Architects: York & Sawyer, New York, N. Y.

MERCHANDISE MART, CHICAGO, ILLINOIS
Ozark Gray Veined toilets
Architects: Graham, Anderson, Probst & White, Chicago, Ill.

ROSENWALD MUSEUM, CHICAGO, ILLINOIS
Ozark Tavernelle floors
Architects: Graham, Anderson, Probst & White, Chicago, Ill.

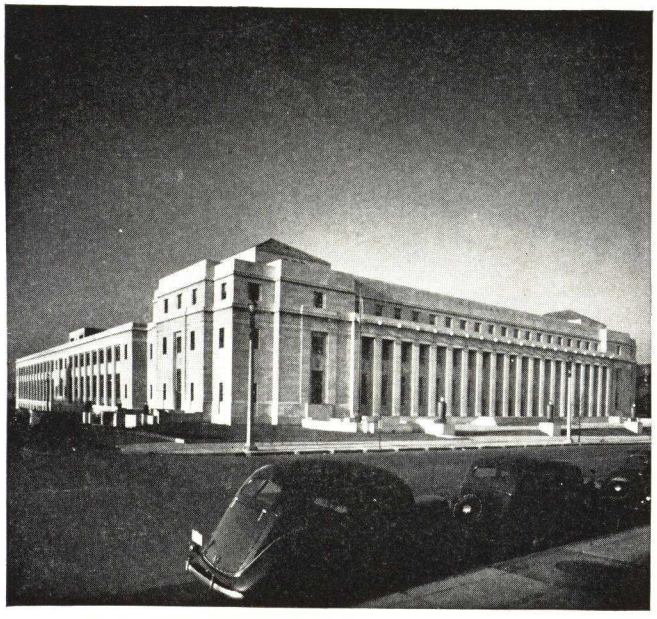
MUSEUM & EXHIBIT BLDG., SHREVEPORT, LA.
Ozark Gray Veined toilet rooms throughout
Architect: Edward F. Neild, Shreveport, La.

U. S. POST OFFICE (Illustrated below), KANSAS CITY, MO.
Ozark Gray Veined and Ozark Tavernelle lobby and corridors
Architects: U. S. Government

FIRST NATIONAL BANK, OKLAHOMA CITY, OKLA.
Ozark Gray Veined corridors throughout
Architects: Weary & Alford, Chicago, Ill.

STATE OFFICE BUILDING, JEFFERSON CITY, MO.
Carthage Marble exterior
Architects: Keene & Simpson, Kansas City, Mo.

SOUTHWESTERN BELL TELEPHONE BLDG., DALLAS, TEX.
Ozark Gray Veined corridors and toilets
Architect: I. R. Timlin, St. Louis, Mo.



U. S. POST OFFICE, ST. LOUIS, MO.—SEE ABOVE

U. S. POST OFFICE, KANSAS CITY, MO.—SEE ABOVE

MEMORANDA

ESTABLISHED 1919

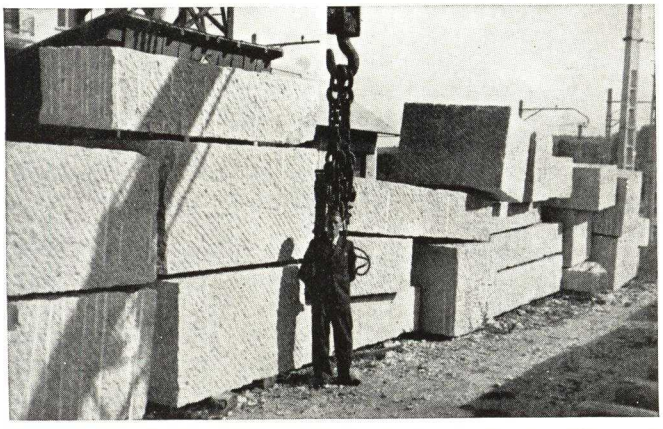
REES-VOLCKMANN CO., INC.

Wholesale Dealers, Importers, Quarry Agents of Foreign, Vermont and Tennessee Marbles, Pennsylvania and Vermont Slate

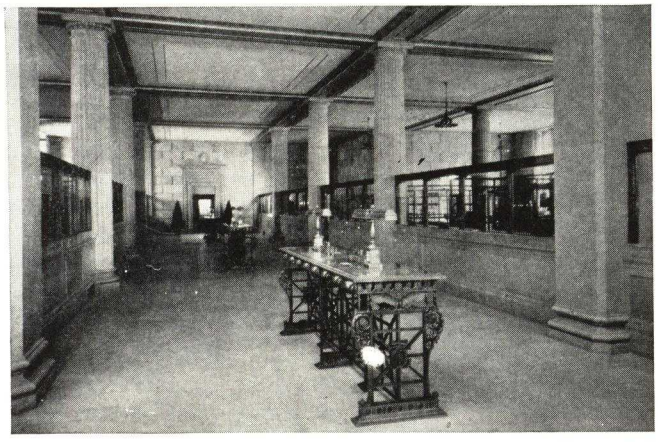
TELEPHONE
MElrose 5-8033
5-8034

344 Walnut Avenue
NEW YORK, N. Y.

CH Hauteville Marble Blocks in the Quarry



CH Hauteville Blocks at Railroad Station in France, Awaiting Shipment to America



CH Hauteville Marble Used in the Offices of Guaranty Trust Co., 44th St. and 5th Ave., New York, N. Y.

Our purpose is to maintain and have available at all times large stocks of the best quality and choicest staple Foreign, Tennessee and Vermont Marbles. Our facilities, and those of the well-known producers here and abroad for whom we distribute and whom we represent, place us in an unexcelled position to execute requirements promptly and efficiently.

Genuine CH Hauteville

We are the sole representatives for the United States, Canada and Cuba for this celebrated close-grained, buff colored marble. The quarry is producing large quantities of blocks of unsurpassed quality, large sizes and uniform color. Reasonable requirements can be supplied from fresh shipments in New York, while large inventories are carried at the quarries abroad. This is again becoming a popular marble and is winning approval of the leading architects. CH Hauteville is, and always has been, a dependable decorative marble for all purposes.

Foreign Marbles

All our imported marbles are selected and carefully inspected by our foreign representative, and our policy has always been *"quality first."*

Among the marbles we import and distribute are: *Genuine CH Hauteville, Belgian Black, Blue Belge, Botticino, Red Levanto, Roman Travertine, Alps Green, Black and Gold, Rosato, Red and Yellow Verona, Forest Green, Rouge Royal, Breche Violette, Statuary and English Veined Italian, Ordinary Italian.*

Domestic Marbles

Tennessee. John J. Craig Company, Knoxville, Tenn.—We are the sole representatives in the New York District and New England Territory for the products of the John J. Craig Company, Knoxville, Tenn., producers of many well-known varieties of Tennessee—*Diamond C Craig Pink, Marmor Pink, Royal Rouge, Hamil Pink, Hamil Gray, Victoria Pink, Campania Light Rose, Campania Deep Rose, Monte Neva, Baker Dark, Henderson Dark, Craig Edward, Hamil Edward, Morrocco Black.*

Several of the above marbles are highly colored and decorative.

Laboratory tests verify that Tennessee marbles are superior for many uses. Absorption, freezing and crushing strength tests prove them unsurpassed where these factors are essential.

The above Tennessee products, together with all other foreign and domestic marbles, are fabricated and erected by the *Candoro Marble Company, Knoxville, Tenn.,* in their large finishing mill.

We invite Inquiries from Architects and Owners and should be pleased to forward Samples and Further Information

VERMONT MARBLE COMPANY

Producers and Manufacturers of Exterior and Interior Marbles
Finishers of Foreign Marbles for Interior Purposes

PROCTOR, VT.

BRANCHES AND SALES OFFICES

ALBANY, N. Y., 805 State Bank Building
BOSTON, MASS., 44 School Street
CHICAGO, ILL., 228 No. LaSalle Street
CLEVELAND, OHIO, 4300 Euclid Avenue
DALLAS, TEX., Vermont Marble Company of Texas, 1513 Wall Street
HOUSTON, TEX., Vermont Marble Company of Texas, 310 Bringhurst Street
LOS ANGELES, CAL., 727 West 7th Street, Suite 857
NEW YORK, N. Y., 101 Park Avenue
PHILADELPHIA, PA., 22nd and Westmoreland Streets
SAN FRANCISCO, CAL., 525 Market Street
TACOMA, WASH., East End 11th Street Bridge
TORONTO, ONT., Ontario Marble Co., Ltd., 403 Manning Chambers Building

Facilities

The company has large sawing mills and finishing plants in Vermont; also finishing plants in Philadelphia, Houston, Chicago, Dallas, San Francisco, Tacoma, and Peterboro, Ontario. (Ontario Marble Co., Ltd.)

This gives widespread distribution and closer contact with the trade.

American and Foreign Marbles

In addition to the fifty or more varieties of marble from our Vermont and Colorado quarries, we finish and install also marble from European and other foreign quarries. This gives us an almost unlimited range of colors, and our shops are equipped with the modern machinery that is required to turn out large work efficiently and in a minimum of time. The character of the output, both in native and foreign stock, is brought out by the illustrations on these pages.

Exterior and Interior Service

Our shops, mills and quarries are adjusted to all kinds of building work—both exterior and interior. Nothing is too large—nothing too small. Marble can be provided to fit any appropriation. An ample stock of quarry blocks and sawed slabs always on hand. . . . Exterior is sold finished complete, ready to set by general contractor or by his stone-setting sub-contractor. This applies also to interior marble; it may be finished complete, sold to and erected by local interior marble dealers, or it may be set by the Company's own organization.

Exterior Building Marble

Contracts for Exterior Marble may cover all the wall work, as in the case of the Supreme Court Building below or they may call for no more than marble trim, or even marble sills. In these days, particularly, there is a demand for marble in the work of renovating old buildings. Marble is being used extensively also in the modernizing of shop fronts, and as a veneer in the refinishing of entire buildings.

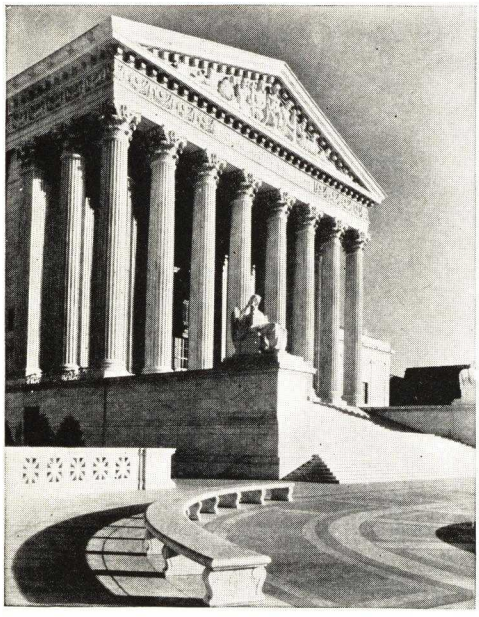
For Fronts and Veneer work, many varieties and colors are available. For regular exterior walls, the colors usually range from clear white to bluish gray.

In the same way the finishes vary according to use. For shop fronts the finish may be grit, hone or polish, while for ashlar walls it is usually sand finish, preventing atmospheric dirt from adhering to a tool or axe surface.

Still another form of construction for exterior walls is what is known as Random Ashlar. In this work, as the name signifies, the pieces, sawed square, are of varying sizes and the color scheme may be random or blended as desired. The setting can be done by ordinary stone masons and at lower cost than the setting of field stone. Illustrated folders on Random Ashlar, Marble Trim and Store Fronts will be mailed for the asking.

The deposits of the VERMONT MARBLE COMPANY are so large and so fully developed that it is possible to produce not only blocks of great size for columns and other exacting requirements, but also the stock which is adapted for the finest of sculpture.

There have recently been furnished, along with exterior of Vermont Danby Marble, blocks weighing 83 tons in the rough for the gigantic figures at the entrance of the capitol at Salem, Ore.



United States Supreme Court Building, Washington, D. C.
Vermont Danby Marble
CASS GILBERT, CASS GILBERT, JR., JOHN R. ROCKART, Architects
DAVID LYNN, Architect of the Capitol

Entrance, Allyn Residence, Dayton, Ohio
Vermont Marble and Brick
DWIGHT JAMES BAUM, Architect

Interior Building Marble

For the interior of the building the range of color and veining is almost unlimited, opening the way to any effect which the architect desires. In the case of wall work it is only necessary to select those varieties which meet the demands of the color scheme. For other purposes, such as floors, stair treads and toilets, only those marbles which are suitable for harder usage should be specified.

Generally speaking, the finished face of standing marble is brought out 1½ in. from the rough wall and held in place by brass, copper or aluminum anchors, which are attached to the supporting wall. Toilet marble may be held in place by metal supports or it may be self-supporting.

Interior marble which is not exposed to wear is usually polished. In certain cases it may be given a hone finish. Floors and stair treads should have a fine sand finish.

The adaptability of marble to all forms of interior construction is well understood. Whether it be applied to public buildings, offices, banks, educational institutions, hospitals, theaters, churches or homes, it marks them with distinction and quiet beauty. Above all it is economical, because it needs no redecorating and is kept in condition by occasional cleaning.

The price depends altogether on the kind of marble and the type of construction. Even a plain wall has almost as many different prices as there are grades of marble, and there may be elaborate pieces and complicated sections which also have a decisive effect on costs. Each estimate, therefore, is a law unto itself and must be figured on its own basis.

Representative examples will be furnished gladly on request, and Standard Specifications and Details will be mailed to anyone who is interested.

It is manifestly impossible to give lists of the many buildings where our marbles have been installed.

Library Stack Slabs

The light-reflecting qualities of crystalline Vermont marble is superior to any other flooring material used for this purpose. Library Stack Slabs of Vermont Marble have been in use for over 100 years in all parts of the country. Due to the extensive quarrying operations already mentioned, a large supply is kept in reserve. As an added advantage, modern mills and shops, operated entirely by electricity, with adequate transportation facilities by both rail and truck, insure prompt deliveries as required. Vermont Marble is specially adapted for changes or additions to existing buildings, because it is obtainable at all times to match previous installations. It will keep pace with the expansion of the library.

We urge the architect to take advantage of the helpful service offered, without obligation, by the leading equipment and steel book stack manufacturers. Send for circular.

Marble Exhibit in New York City

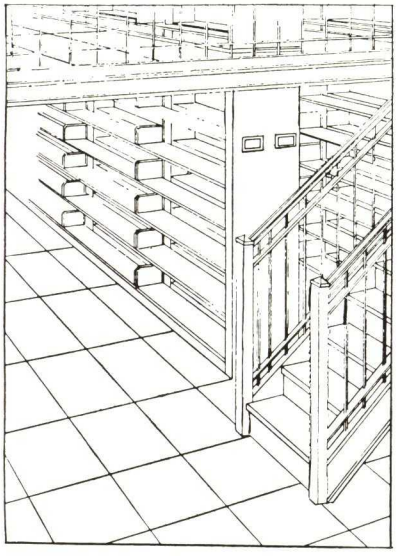
There is an exhibit of large-sized samples of our marbles at our New York office in the Architect's Building, 101 Park Avenue, to which architects, engineers, contractors and owners are cordially invited.

Larger Display at Proctor

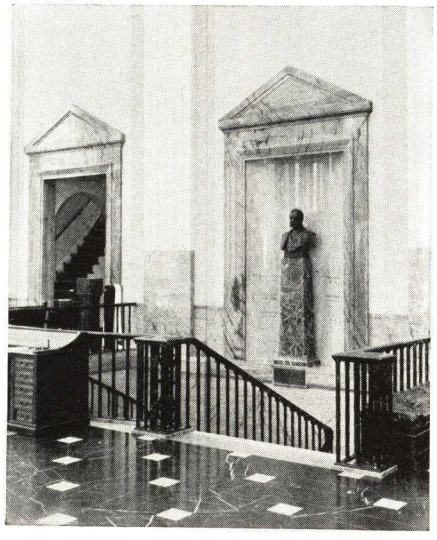
The *new marble exhibit* at Proctor includes more than 50 varieties of marble from our quarries in Vermont, Colorado, Montana and Alaska—wainscot and base, set in spacious booths in varied arrangements of color and veining. Visitors are welcome. Especially do we urge architects and builders to see this display.

Care of Marble

Marble needs no redecorating or refinishing but does need occasional cleaning, and that work should be intelligently done. A little book issued by the VERMONT MARBLE COMPANY, contains all the necessary instructions. This book will be sent to any one who will take the trouble to write for it.



Library Stack Slabs



First National Bank, New York, N. Y.
Taconic Gray Marble
WALKER & GILETTE, Architects

Indiana War Memorial, Indianapolis, Ind.
Columns of Royal Red Marble
Shrine of Vermont Verde Antique Marble
WALKER & WEEKS, Architects

Internal Structure

All Vermont Marbles are made up of tightly interlocked crystals. This not only gives them strength and durability, but adapts them to sculptural and other intricate forms where fineness of detail is essential.

Compressive Strength and Weight

The marbles we recommend for exterior building work could be used in the base of a tower 2½ to 3 miles high before failure from compression alone would result.

The weight of marble is approximately 170 lbs. to a cubic foot.

Absorption

The freezing of moisture, completely filling open space in a rock, is the most severe test to which that rock can be sub-

jected. No stone has been found which is unaffected by this test. It follows, therefore, that other factors being the same, the best stone is one which will exclude moisture most completely.

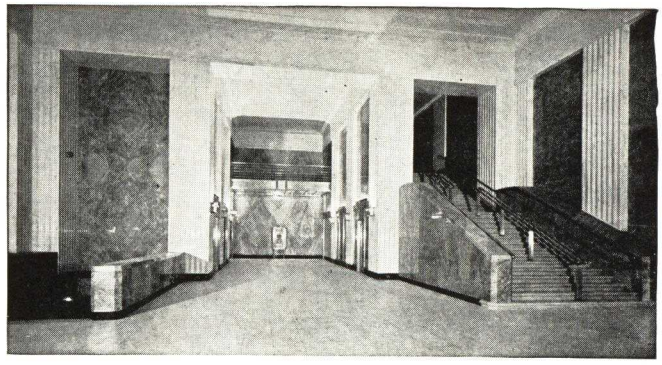
Water expands when it freezes and forces the containing walls farther apart. Fracturing due to this cause increases greatly with the increase in absorption. Other things being equal the stones which absorb the least water will be most likely to endure.

The marbles which we recommend for exterior purposes have an absorption of approximately one-tenth of one per cent by weight. This is less than that of any other masonry material.

Weathering

Marble is so impervious to moisture that action is limited to the exposed surfaces of the stone.

In the process of weathering there is formed a protective coating which is nature's own best preservative. That is one reason why we do not recommend the sandblast for cleaning.



Field Office Building, Chicago, Ill.
Yule Colorado and Foreign Marbles
GRAHAM, ANDERSON, PROBST & WHITE, Architects

LUMAR—A NEW VERMONT MARBLE PRODUCT

For Unusual Surface and Light Diffusion Effects

"Lumar Yule"—Eypel Store Front—Brooklyn, N. Y.
Installed by JAFF BROS., Long Island City, N. Y.

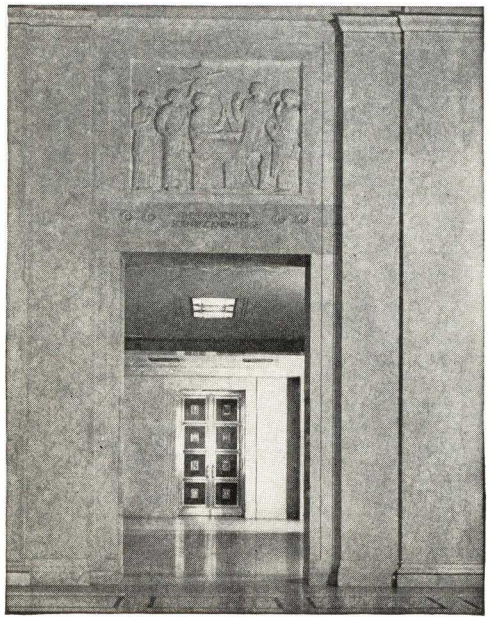
A Thin Translucent Marble Slab

Lumar is a genuine marble—not an imitation or a substitute—cut in panels that have the quality of efficient transmission of light, making possible new and distinctive light and color effects. The natural surface beauty of real marble is further enhanced by having sub-surface crystalline structure and hidden color and markings made apparent.

Lumar adds distinction, sales appeal and an aesthetic quality wherever the addition of light and color can bring new interest and beauty to marble. The addition of transmitted light transforms the marble so that two distinctly different decorative treatments are possible—unilluminated and illuminated. It is an integral part of the design in either case.

Lumar fills the need of a decorative material, incorporating all the inimitable beauty of a natural product.

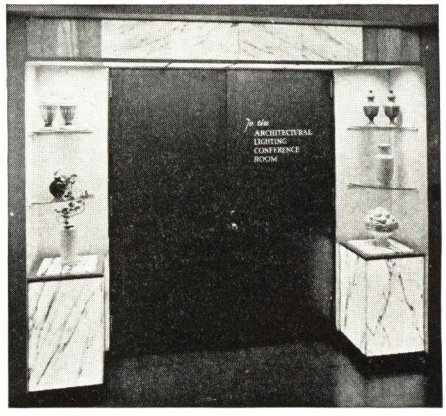
Send for circulars descriptive of lighting requirements plain and colored bulbs—setting, etc.



Mellon Institute of Research, Pittsburgh, Pa.
Botticino Combined with Other Foreign and American Marbles
JANSSEN & COCKEN, Architects

Used For

Pilasters
Columns
Posts
Spandrels
Frieze Courses
Pylons
Wall Panels
Ceiling Panels
Screens
Counters
Showcases
Table Tops
Lettered Panels
Coves
Cornices



Entrance to Lighting Room, General Electric Co., Nela Park, Ohio
Lumar Yule and Green Vein

GENERAL COLOR OF LUMAR MARBLES

"Lumar Yule"—Finely lined striations, golden brown markings.

"Lumar Pavonazzo"—Green clouds floating in a field of deep creamy yellow.

"Lumar Green Vein"—Sunset colors, crossed by bands of soft green.

"Lumar Brocadillo"—Bands and bars of alternating green and yellow.

"Lumar Antique"—Golden — combination of light and dark wavy effects with crystal clear areas of quartz.

MARKWA—A NEW MEMBER OF THE TILE FAMILY

Through the introduction of special equipment the VERMONT MARBLE COMPANY is offering "Markwa," a genuine marble in tile form, ½-in. thick, cut to standard sizes and grooved on the back like glazed tile. It is specified under the tile specification and set by the tile contractor. It will appeal particularly to those who appreciate marble's individuality in color and veining and wish to avoid monotony in wall treatment.

Markwa may be used alone or combined with other kinds of tiling, contributing richly to the decorative effect. Being a natural product of the quarry, it is subject to variations in color and veining.

Finishes—The standard finish of Markwa is Bright (gloss), and is intended primarily for interior walls. Matt finish (dull, with little or no reflective quality) and Flemish Non-slip finish can be substituted without extra cost. These last two finishes are adapted for floors.

Bathroom in Residence of Harry A. Fulton, Architect, Cleveland, Ohio
Markwa Nos. 7 and 19

Bonding Surfaces—The back of Markwa has two parallel bonding grooves approximately ¼-in. wide and from $\frac{1}{16}$ to ⅛-in. deep. The surface of the back is rough, and this, with the grooves, insures a tight bond in erection.

Durability—The finished surface of Markwa is an integral part of the structure and will not crack, chip or craze. It is free from imperfections, such as pinholes and warped faces. It is fast in color and will not fade.

Varieties—The delicate tones and markings of Markwa cannot be described but bulletins are available from the Company which describe the general veining characteristics and a number system to be used in specifying.

Vestibule in Apartment House, Bronx, New York
A. HERZOG, Architect
Markwa Nos. 101 and 102

Sizes—Standard sizes are 6x12, 9x9 and 12x12 in. Other sizes, over 6 in. square, can be considered as "special standard" if ordered in lots of 100 or more, but both dimensions (length and height) must be in full inches (no fractions).

Markwa is not more than ½-in. thick or less than $\frac{7}{16}$-in. The toleration in the fabrication length or width may be $\frac{1}{32}$-in.

Sizes less than 6x12 or 9x9 in. are not recommended.

Special pieces and moulds, such as bullnose cap, corner trim, cove and capping will be manufactured on order.

Weight

The weight of Markwa, unboxed, is about 7 lbs. a sq. ft. See Producers' Council Bulletin No. 22 for further information.

Specify Markwa as Tile

MEMORANDA

CUT STONE ASSOCIATION OF INDIANA

AN ASSOCIATION OF

Producers and Fabricators of Indiana Limestone

P. O. Box 57, BLOOMINGTON, IND.

MEMBER FIRMS

Bedford Cut Stone Company, Bedford, Indiana.
Bloomington Limestone Corporation, Bloomington, Indiana.
Bowman & Schwab Stone Company, Bloomington, Indiana.
Fagan Stone Company, Inc., Bloomington, Indiana.
The Carl Furst Company, Bedford, Indiana.
Monon Stone Company, Bloomington, Indiana.
Shawnee Stone Company, Bloomington, Indiana.
Swenson Stone Company, Bloomington, Indiana.
Woolery Stone Company, Bloomington, Indiana.

INDIANA Oolitic LIMESTONE

The Product

Indiana Limestone is nationally known. Its permanence, durability and general utility have been firmly established by its use over a period of more than three-quarters of a century in many of this country's most architecturally prominent buildings and it enjoys the distinction of being the most used building stone in America.

Its good structural and pleasing color tone characteristics, together with its excellent working qualities, render Indiana Limestone particularly adaptable to the economical interpretation of all types of architectural design.

Classifications—Regular Grades

Select Buff
Standard Buff
Rustic Buff
Select Gray
Standard Gray
Old Gothic

Variegated (a promiscuous combination of Buff and Gray).

Description of the various grades of stone will be furnished on request. The Quarry and Mill capacity of member firms exceeds any probable demand.

INDIANA LIMESTONE

THE NATION'S BUILDING STONE

The U. S. Bureau of Mines, in their report on the Indiana Oolitic Limestone Industry in 1936, states: "The district surrounding Bedford and Bloomington furnishes between 85 and 90 per cent of the total building limestone produced in the United States."

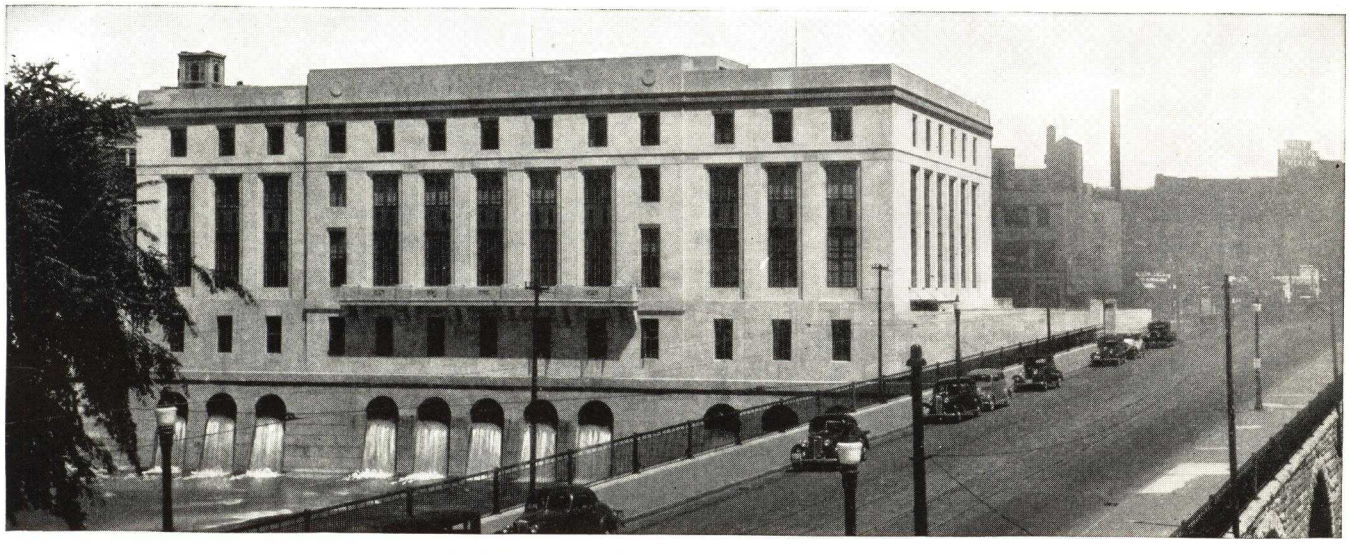
Service Available

The Cut Stone Association of Indiana is a service organization only—of long standing.

A Plan Bureau is maintained to facilitate estimating and bidding on Indiana Limestone. Through this association Architects may obtain preliminary estimates, and suggested form of specifications on Indiana Limestone.

Architects and Contractors are requested to make use of our plan bureau. By so doing it assures a number of fair competitive bids. Plans should be sent to this Association as soon as possible in order that each member firm may have sufficient time to make individual estimates.

For all ordinary projects, it is necessary for the Architect or Contractor to send only one set of blue prints and specifications to this Association to secure the desired number of competitive bids, as such plans, when received, are at once circulated to the firms listed above; all of whom have established reputations for skillful work and fair dealings with leading Architects throughout the country.



Rundell Memorial Public Library, Rochester, N. Y.
A unique building of variegated Indiana Limestone, located in river between two city street bridges. Note sluice water emptying through rear wall of building. Three city street car tracks run under front portion of building

INDIANA LIMESTONE CORPORATION

Producers and Fabricators of ILCO Indiana Limestone

GENERAL OFFICES

BEDFORD, INDIANA

SALES OFFICES

CHICAGO, ILL., Tribune Tower
CLEVELAND, OHIO, Hippodrome Building
DALLAS, TEX., 5219 Maple Avenue
KANSAS CITY, KANS., Fifth and Cheyenne Streets
ST. LOUIS, MO., Railway Exchange
SAN FRANCISCO, CALIF., 130 Lunado Way
WASHINGTON, D. C., Colorado Building

CANADIAN REPRESENTATIVE: Walter J. Skelly, 6 Garfield Avenue, TORONTO, ONT.
INDIANA LIMESTONE COMPANY OF NEW YORK, INC., 40 East 41st Street, NEW YORK, N. Y.

Listed below are a few of the many outstanding structures, the stone for which was quarried and fabricated by the Indiana Limestone Corporation and predecessor companies:

State Capitol, Charleston, W. Va.
State Capitol, Lincoln, Nebr.
North and South State Office Buildings, Harrisburg, Pa.
Soldiers and Sailors Memorial Bridge, Harrisburg, Pa.
U. S. Post Office, Pittsburgh, Pa.
U. S. Post Office, Kansas City, Mo.
Milwaukee County Courthouse, Milwaukee, Wis.
Davidson County Courthouse and Jail, Nashville, Tenn.
Criminal Courts Building, Chicago, Ill.
Criminal Courts Building, New Orleans, La.
Mellon Institute of Industrial Research, Pittsburgh, Pa.
Civil Courts Building, St. Louis, Mo.
Indiana World War Memorial, Indianapolis, Ind.
Cathedral of Learning, University of Pittsburgh, Pittsburgh, Pa.
Rockefeller Chapel, University of Chicago, Chicago, Ill.
Massachusetts Institute of Technology, Cambridge, Mass.
Duke University Buildings, Durham, N. C.
Horace H. Rackham School of Graduate Studies, University of Michigan, Ann Arbor, Mich.
Liberty Mutual Life Insurance Co. Building, Boston, Mass.
Christian Science Publishing Co. Building, Boston, Mass.
Southern New England Telephone Co. Building, New Haven, Conn.
Acacia Mutual Life Insurance Co. Building, Washington, D. C.
Chicago Daily News Building, Chicago, Ill.
Merchandise Mart, Chicago, Ill.
Tribune Tower, Chicago, Ill.
Palmolive Building, Chicago, Ill.
Fidelity Philadelphia Trust Co. Building, Philadelphia, Pa.
Koppers Building, Pittsburgh, Pa.
R. J. Reynolds Tobacco Co. Building, Winston-Salem, N. C.
Cleveland Terminal Group, Cleveland, Ohio
Los Angeles Times-Mirror Building, Los Angeles, Calif.
Rand Tower, Minneapolis, Minn.
First National Bank, Detroit, Mich.
Illinois Merchants Bank, Chicago, Ill.
Foreman National Bank, Chicago, Ill.
American Exchange Bank, Dallas, Tex.
Hibernia Bank & Trust Co. Building, New Orleans, La.
Canal Bank & Trust Co. Building, New Orleans, La.
Federal Reserve Bank, Chicago, Ill.
Federal Reserve Bank, St. Louis, Mo.
Federal Reserve Bank, Kansas City, Mo.
Federal Reserve Bank, Richmond, Va.

Stone from ILCO *quarries, fabricated by others, has been used in many buildings, a few of which are as follows:*

Rockefeller Center, New York, N. Y.
New York Life Insurance Co. Building, New York, N. Y.
Cunard Building, New York, N. Y.
Standard Oil Co. Building, New York, N. Y.
Empire State Building, New York, N. Y.
Bronx County Courthouse, New York, N. Y.
Riverside Church, New York, N. Y.
Cathedral of St. John the Divine, New York, N. Y.
Mt. St. Alban's Cathedral, Washington, D. C.
Royal York Hotel, Toronto, Ont., Canada
Metropolitan Life Insurance Co. Building, Ottawa, Ont., Canada

ILCO INDIANA OOLITIC LIMESTONE IN FEDERAL BUILDINGS

The INDIANA LIMESTONE CORPORATION has had the distinct honor of furnishing stone for a majority of the new Federal Buildings in Washington, as well as for many of the outstanding structures found throughout the United States and Canada.

Federal Triangle Group **Washington, D. C.**

Reading from left to right—Department of Commerce Building, Department of Labor and Interstate Commerce Building, Bureau of Internal Revenue Building, Department of Justice Building, and the Archives Building—all constructed of ILCO Indiana Limestone from the quarries and mills of the INDIANA LIMESTONE CORPORATION.

With more than a score of quarries and mills located in Lawrence and Monroe counties, Indiana, the INDIANA LIMESTONE CORPORATION *is equipped to supply any grade or classification of Indiana Limestone in any quantities required.*

BUILD THE NATION SECURELY WITH
INDIANA LIMESTONE
The NATION'S BUILDING STONE

ESTABLISHED
1859

VERMONT STRUCTURAL SLATE CO.

MAIN OFFICE
FAIR HAVEN, VERMONT
NEW YORK SALES AND ARCHITECTURAL OFFICE: 103 PARK AVENUE—TELEPHONE, LEXINGTON 2-4036
OFFICES IN OTHER PRINCIPAL CITIES

Manufacturers of "Allenstone Products"

Capacity of Manufacturing Properties

Roofing Slate—Eight quarries producing all colors and texture with production of 4,000 squares per month.

Flagstones—Two carloads per day.

Structural Slate—Three mills with capacity of 25,000 square feet per month.

Flooring—Mills and special equipment producing 1,500 surface feet per day.

Products

VERMONT UNFADING GREEN STRUCTURAL SLATE

VERMONT UNFADING MOTTLED GREEN AND PURPLE STRUCTURAL SLATE

VERMONT UNFADING PURPLE STRUCTURAL SLATE

GARDEN FLAGGING OR STEPPING STONES

ROOFING SLATES ALL COLORS

This list of 1938 projects, where our material was approved and used, indicates the high quality of our product and service:

Will Rogers Memorial, Claremore, Okla., Flooring, Base, Treads, etc.

Bryn Mawr College Dormitory, Bryn Mawr, Pa., Roofing Slate.

Boat House and Field House, World's Fair, New York City, Roofing Slate.

STRUCTURAL SLATE

Description

Vermont structural slate is the name applied to structural slates quarried in or near Fair Haven, Vermont, and quarried in blocks ranging from 4x2 to 8x6 ft. in various thicknesses.

The process of manufacture is to horizontally split the quarried blocks to a suitable thickness and to vertically cut to the approximate sizes required. The slabs are then passed through planers; after which operation they are ready to be reduced to exact dimensions on rubbing beds or through the use of air tools and other special machinery.

Vermont structural slate is a hard, dense rock formed by metamorphic action from clavey shale. It is exceedingly strong, hard and perfectly non-absorbent and does not chip or spall easily. It stands foremost among the natural stones used in architectural and engineering work on account of its strength and durability. Few possess so fine and firm a texture or so remarkable a tranverse resistance. Vermont structural slate is not affected by dilute mineral acids, and the permanency of color in combination with the lasting qualities of the rock make it desirable in many cases where for esthetic reasons black slate should not be used.

Color

The colors are distinct and permanent, ranging from a light green to a dark purplish brown. The most popular colors are the different shades of unfading green, unfading mottled green and purple, and unfading purple.

Finishes

The standard finish for Vermont structural slate is the regular and rubbed finish. This method of finishing reduces the surfaces finished to perfectly true, smooth surfaces. The arrises, where desired, are remarkable for their perfectly sharp and true lines. A handhoned finish furnished when required.

Sizes

The approximate maximum limit of surface size in which Vermont structural slate can be produced is 6 ft. wide by 8 ft. long. Greater lengths, however, can be furnished in lesser widths.

The limit in width, for stair platforms, partitions, etc., is 6 ft. 3 in.

Uses

Large quantities of Vermont structural slate are furnished for water closet enclosures, shower bath enclosures, urinal stalls, etc.; for floors, either in large slabs, random rectangular or other shapes; for wall base, wainscoting, plinths, thresholds, floor borders, etc.; for stair treads, strings and platforms; for door and window sills.

For roofing and other structural purposes.

Also used extensively for electrical apparatus.

Prices

Prices, samples, etc., will be furnished upon request.

Our architectural and service department is thoroughly competent and qualified to assist architects in the preparation of drawings and specifications. We welcome requests for information relative to the use of our product.

Approved by the Investigating Committee of Architects

THE BRIAR HILL STONE CO.

Golden Buff and Variegated Sandstone; Golden Tone Ashlar Veneer

GLENMONT, OHIO

Briar Hill Golden Tone BRIAR HILL GOLDEN TONE SANDSTONE Sandstone, rough blocks, sawed slabs, ashlar veneer, or cut and carved ready to set.

Varieties — Golden Buff, Variegated in either light or dark shades, and "run of quarry" which comprises all colors. Variegations consist of banded, mottled, speckled and clouded markings in an infinite variety of patterns and combinations. For this reason it is practicable to select for color only in a very general way.

Adaptability — Suitable for all classes of buildings, both for interiors and exteriors; effective as cut stone trim and widely used as an ashlar veneer for facing residences, churches, college and school buildings.

Durability — Briar Hill Sandstone is permanent in texture and color. It is 95% pure silica cemented with iron. Many old buildings of this stone are approaching the century mark and are as colorful and sound today as when first built. Age merely mellows the beauty of this colorful stone.

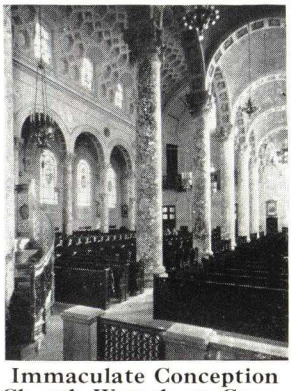
Physical and Chemical Properties — Results of physical and chemical analyses, compression, freezing and absorption tests gladly furnished upon request.

Quarries — Our extensive quarries insure a practically unlimited supply of this stone.

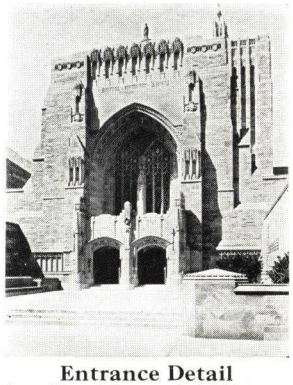
Facilities — Both quarries and mill are thoroughly equipped with modern machinery, capable of handling any size project. Prompt, efficient execution of contracts assured at all times.

Price — Although distinctive and yielding infinite color resources to the architect's skill, Briar Hill Stone is reasonable in cost. It is easy to work and therefore economically available for all classes of buildings.

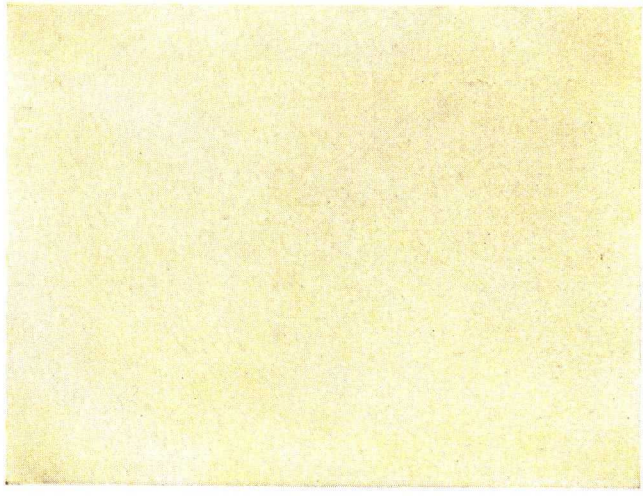
Ashlar Veneer — Briar Hill Stone is furnished as a Veneer Wall Facing to be used like face brick and at prices but little higher than a good grade of face brick. See the next page for details.



Immaculate Conception Church, Waterbury, Conn.
MAGINNIS & WALSH, ARCHITECTS

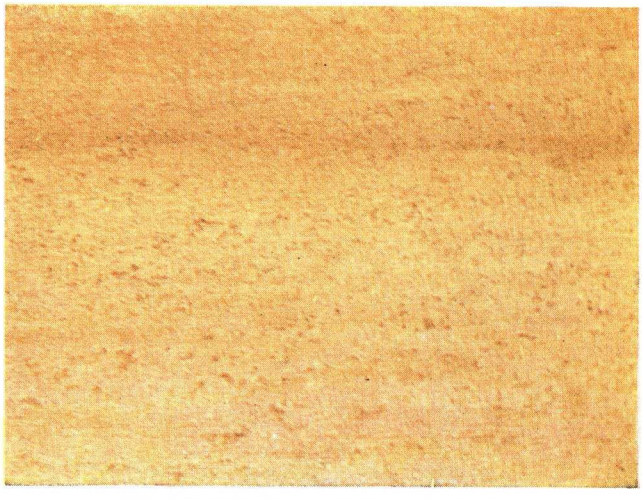


Entrance Detail Sterling Memorial Library Yale University
JAMES GAMBLE ROGERS, ARCHITECT



Briar Hill Golden Buff

Briar Hill Variegated (lighter shades)

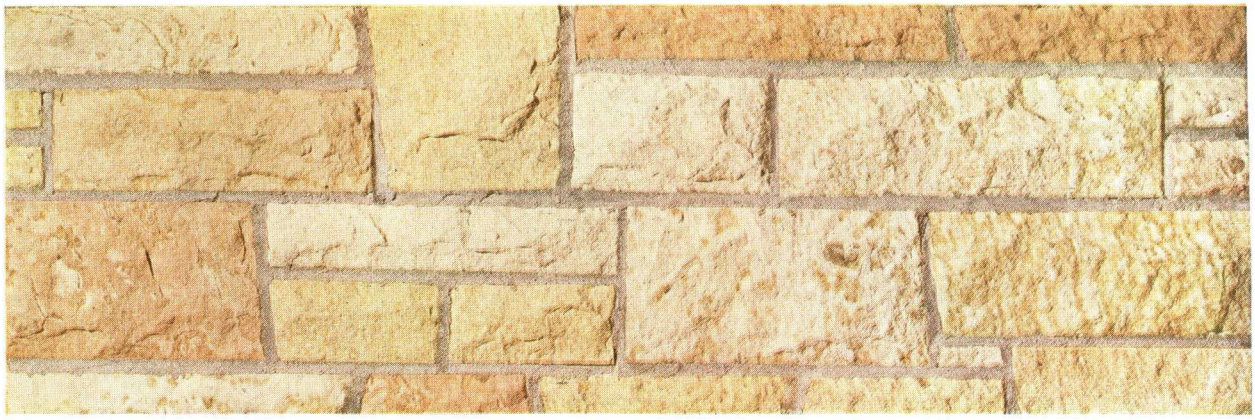


Briar Hill Variegated (darker shades)

Color Illustrations about 1/6 actual size.

THE BRIAR HILL STONE CO.

BRIAR HILL ASHLAR VENEER—A NATURAL STONE WALL FACING

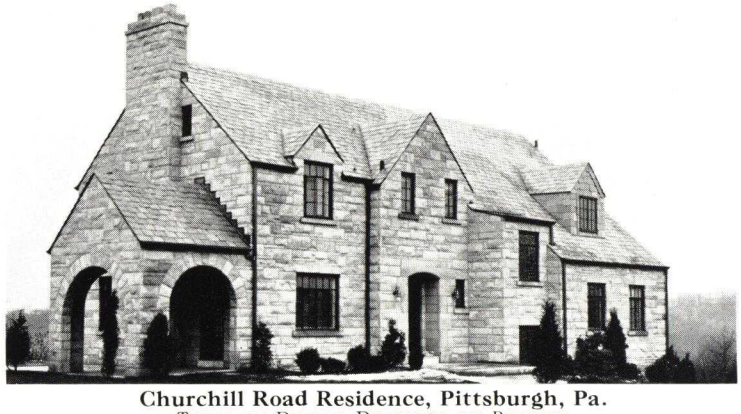


BRIAR HILL SANDSTONE is extensively used as ASHLAR VENEER or WALL FACING for many types of buildings at surprisingly low cost. As an example the cost of all of the ashlar veneer and trim for the Churchill Road residence shown at the right was less than $900.00 delivered in Pittsburgh.

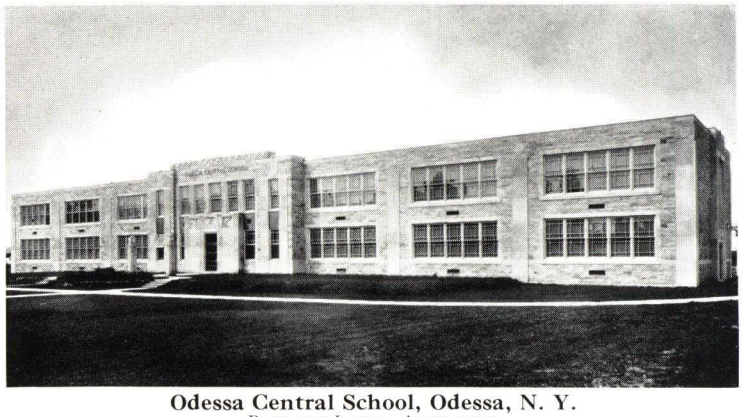
This material is furnished in random length strips, usually four inches thick, with sawed beds, and in course heights to produce random ashlar walls with a *minimum of labor* required on the job. Except for breaking to length the stone is ready to set when delivered to the job. It is set rapidly and economically by either stone masons or bricklayers. Surface finishes or textures are either "Split Face," "Shot Sawed" or "Sand Sawed."

OLD BUILDINGS MAY BE RENEWED in appearance, at moderate cost, simply by covering the old exterior with Briar Hill Golden Tone Ashlar Veneer three or four inches thick.

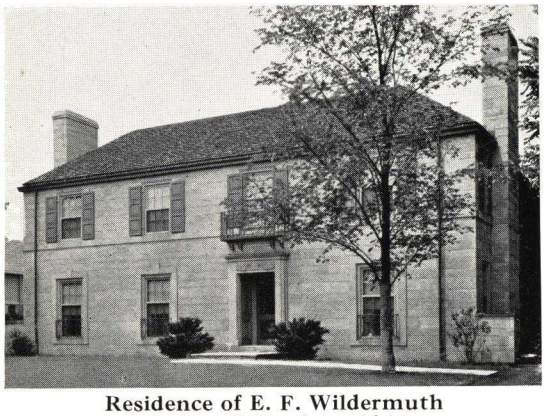
Write for a copy of the Briar Hill Ashlar Wall Facing Booklet, "Distinctive American Homes." It contains complete information as to available course heights, suggested jointing schemes, and other technical data, together with specifications, and photographs of many Briar Hill Ashlar houses. It is free for the asking. We are always glad to submit samples or estimates of cost for either ashlar or cut stone trim if plans are mailed to us.



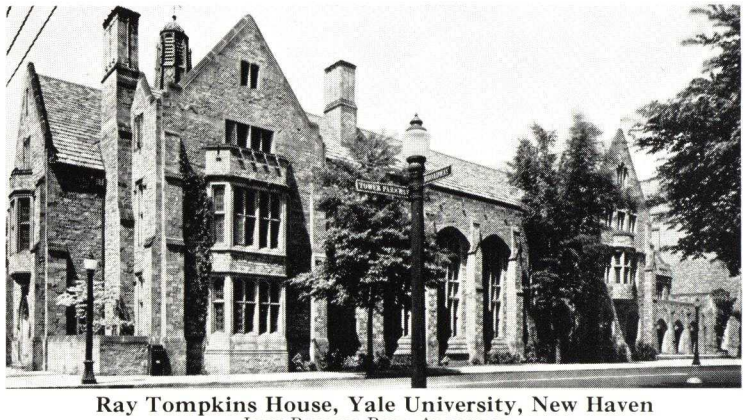
Churchill Road Residence, Pittsburgh, Pa.
TRILLI AND DUNBAR, DESIGNERS AND BUILDERS
(Faced with Split Face Ashlar)



Odessa Central School, Odessa, N. Y.
BLEY AND LYMAN, ARCHITECTS
(Faced with Split Face Ashlar)



Residence of E. F. Wildermuth
Bexley, Columbus, Ohio
BENHAM AND RICHARDS, ARCHITECTS
(Faced with Shot-Sawed Ashlar)



Ray Tompkins House, Yale University, New Haven
JOHN RUSSELL POPE, ARCHITECT
(Faced with Split Face and Shot-Sawed Ashlar)

McCORMICK LONGMEADOW STONE CO., INC.

Producers of Longmeadow Sandstone

QUARRIES AND MILL

EAST LONGMEADOW, MASS.

NEW YORK AGENT: Jerome A. Jackson, Sanford Street and East River, LONG ISLAND CITY, N. Y.
PHILADELPHIA AGENT: Gavin Muir, Architects' Building, PHILADELPHIA, PA.

The Product

LONGMEADOW STONE is a Sandstone which has long been recognized by architects and builders as a most suitable and substantial stone for use in all kinds of buildings, such as churches, schools, libraries, residences, gateways, etc.

Quality and Color

It is a close-grained stone (sometimes called a "liver" rock) which makes it free from scaling or chipping. It has a warm brown color which adds life and spirit to any type of structure. Quoting from a letter by a prominent firm of architects, "In the meantime let us tell you how much we appreciate the character and practicability of the East Longmeadow Stone that you furnished. We like it better because it is not too red. It has a very agreeable warmth and is a stone that will take any texturing and still retain its superior color."

Speaking of the Mt. Holyoke Library and Campus one author writes: "One knew with one's mind that the 'Longmeadow' stone of the library was as old as the dinosaurs and more substantial, but in this light its dim rose-color looked more transitory and more dream like than the hawthorn flowers."

This same stone was used on the impressive Romanesque entrance to Trinity Church, Boston, known as the Galilee porch. It is covered with fine filigree work and detail illustrated below. Although this was erected 60 years ago it still retains its original delicacy and beauty. Such resistance to the elements makes the superiority of Longmeadow stone outstanding.

Facilities

Our quarries have been in operation for the past 70 years. Longmeadow stone has an absorption of 4.2%, with 83% silica content. Crushing strength is 10,000 lbs. per sq. in. The mill is equipped with gang saws, circular saws, planers, etc., which enable us to furnish work ready to set, or furnish the trade with mill blocks or sawed slabs.

Information and Samples

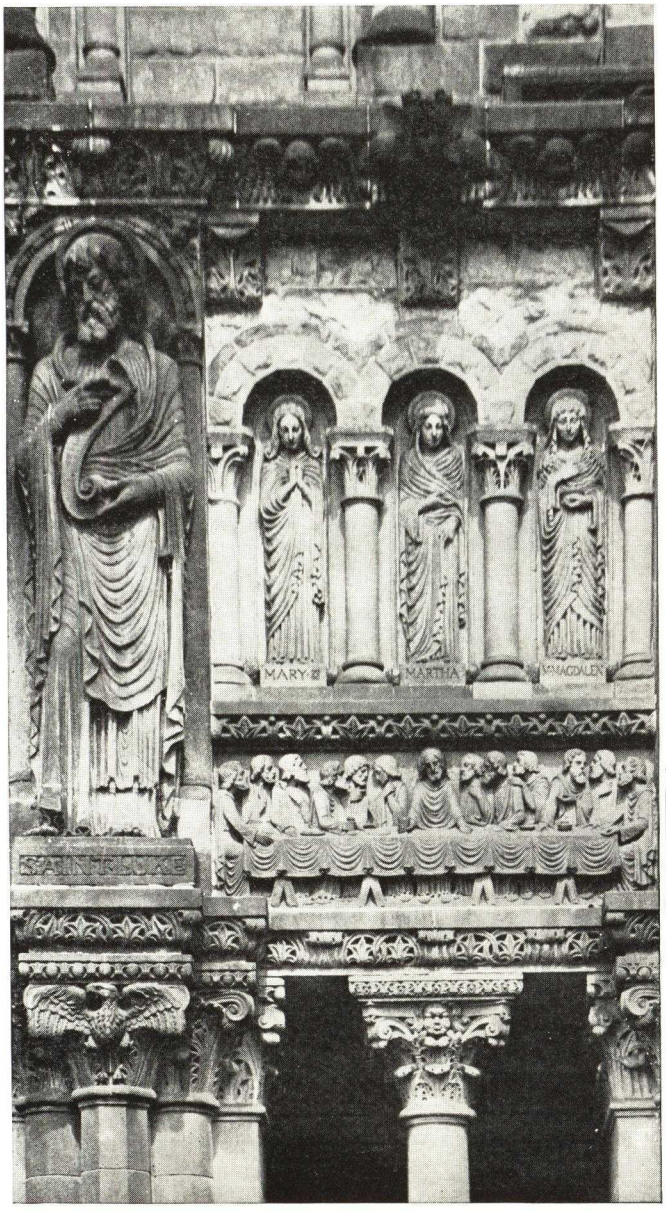
We are glad at all times to furnish estimates for architects or contractors, and to give any information or suggestions which might be helpful in the preparation of designs or plans.

Samples of the stone will be forwarded upon request.

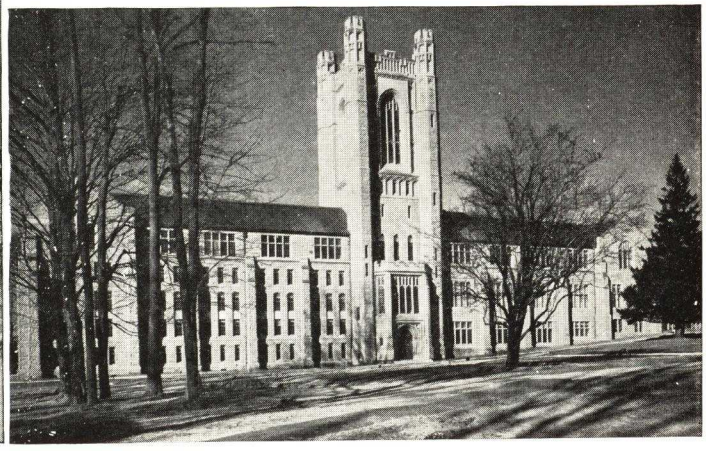
Representative Buildings

Some of our recent contracts have been:
Library at Mt. Holyoke College, South Hadley, Mass.
Library at Smith College, Northampton, Mass.
Dining Hall, State Institution, Northampton, Mass.
Post Office, New Brunswick, N. J.
Post Office, Perth Amboy, N. J.
Chapel at Mt. Holyoke College, South Hadley, Mass.
Chapman Memorial Building, Downer College, Milwaukee, Wis.

Other well-known structures include:
Second Chemical Laboratory, Yale University, New Haven, Conn.
Library and Stack Building, Princeton University, Princeton, N. J.
Marshall Field Building, Chicago, Ill.
New England Building, Cleveland, Ohio.
New York Life Insurance Building, Omaha, Neb.
Library of Drew University, Madison, N. J.
Andrews Memorial High School, Bristol, R. I.
Connecticut State Building, Eastern States, West Springfield, Mass.
Addition U. S. Printing & Engraving Office, Washington, D. C.



The Proof of Weathering Qualities
Photograph taken in July 1937 of carvings on Trinity Church, Boston. Note the present clean edges and crispness of the carving done in 1887.
H. H. RICHARDSON, Architect



Longmeadow Stone Building—Library at Mt. Holyoke College, South Hadley Center, Mass.
ALLEN, COLLENS & WILLIS, Architects

VIRGINIA GREENSTONE COMPANY, INC.

Quarriers and Finishers of Virginia Greenstone

LYNCHBURG, VIRGINIA

A BEAUTIFUL PERMANENT STONE—NON-FADING FOR EXTERIOR USES—NON-SLIP FOR TREADS AND FLOORS

Chronic Disease Hospital, New York, N. Y.
York & Sawyer, Architects
16,000 sq. ft. of stairways

GROUP NO. 1

Virginia Greenstone is usually sawed on the edge grain for stair treads and floors. It presents a perfect and permanent non-skid surface, with a hardness value that exceeds HA. 15.

Other Examples

Acacia Mutual Life Bldg., Washington, D. C., Shreve, Lamb & Harmon, Architects
U. S. Archives Building, Washington, D. C., John Russell Pope, Architect
U. S. Post Office, Greensboro, N. C., Murphy & Olmstead, Architects
Library, Department of the Interior, Washington, D. C., Waddy B. Wood, Architect
Federal Reserve Board Building, Washington, D. C., Paul Phillip Cret, Architect

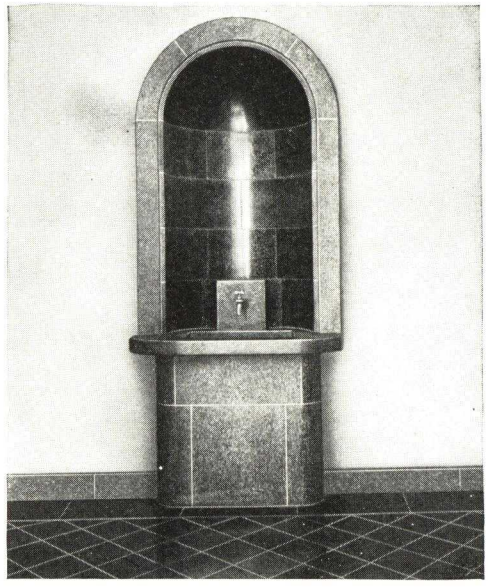
Alfred I. DuPont Building, Miami, Fla.
Marsh & Saxelbye, Architects
812 spandrels

GROUP NO. 2

Virginia Greenstone is practically non-absorbent, and has no superior for exterior trim, spandrels, steps, and grade courses.

Other Examples

Appraisers Stores Building, Baltimore, Md., Taylor & Fisher, Architects
U. S. Post Office, Wausau, Wis., Oppenhamer & Obel, Architects
Swann & Company Building, Birmingham, Ala.
Allied Arts Building, Lynchburg, Va., Johnson & Brannan, Architects
U. S. Post Office, Wilkes-Barre, Pa.
U. S. Post Office, Columbus, Ohio, Richards, McCarty & Bulford, Architects



Residence of Mr. and Mrs. Herbert Thompson, Forest, Va.
Sanhope S. Johnson, Architect

GROUP NO. 3

When polished or honed, Virginia Greenstone is uniformly dark with no off-color lines. No artificial coloring is used.

Other Examples

U. S. Department of Justice, Washington, D. C., Zanzinger, Medary & Borie, Architects
Apex Building, Washington, D. C., Bennett, Parsons & Frost, Architects
Police Headquarters, Buffalo, N. Y.
Kennedy-Warren Hotel, Washington, D. C.

GROUP NO. 4

Absorption 0/2 per cent; compressive strength 8010 pounds per square inch; transverse strength 1350 pounds per square inch.

AMERICAN BLUE STONE COMPANY

PRODUCERS OF THE ONLY GENUINE *GENESEE VALLEY BLUE STONE; THE OLD DARK "NORTH RIVER" BLUE STONE AND *NATURCLEFT FLAGGING

SALES OFFICES
101 Park Avenue, NEW YORK, N. Y.
QUARRIES AND MILLS: AMBLUCO, WYOMING CO., N. Y. and SOUTH UNADILLA, DELAWARE CO., N. Y.

Products

*Genesee Valley Blue Stone, a New York State light blue stone from deep hard deposits for architectural exterior and interior building construction.

"North River" Blue Stone, an Eastern New York State dark, hard blue stone for exterior building work.

*Naturcleft Flagging for Garden Walks, etc.

For *Ambluco Non-slip Treads, Landings, Flooring, Thresholds and Wall Base for interior and semi-interior uses, see File Index.

Facilities

This company was organized and opened its first quarry in 1899. Later it purchased the Genesee Valley Blue Stone Company's property of about 200 acres and extensively developed the quarries which had been in operation since about 1870 at what is now Ambluco, Wyoming County, N. Y. Later, "North River" Blue Stone quarries were purchased and also worked on a substantial basis in the foothills of the Catskill mountains.

At both quarries, mills and yards are equipped with modern machinery. Large volumes of business can be shipped without delay. Sawed stock can be easily finished up by local cut stone contractors.

*Genesee Valley Blue Stone

Color and Texture—A distinctive uniform shade of light blue, blending well with adjacent light colored surfaces, or giving a sharp clean contrast with dark materials. It is of a fine grain and even texture, being made up mostly of pure hard quartz as shown below.

Mineralogically Considered

Fine hard sand, mostly quartz	70%
Clay, as binding material	28%
Water	2%

In this blue stone, quartz, the essential constituent, being harder than the accessory minerals, is pre-eminent on the wearing surface, which makes the stone slip-proof and very durable.

Strength, Weight and Fire Resistance—Few, if any, stones have a greater crushing and transverse strength than this blue stone. Likewise, the stone has high tensile and shearing strengths. The following table gives its crushing strength, as compiled from tests made by the United States Ordnance Department:

Crushing Strength

Rockport granite (Kidder's Hand Book)	17,750 lb. per sq. in.
Vermont marble	Average 13,500 lb. per sq. in.
Genesee Valley blue stone	19,970 lb. per sq. in.

Although of great density, it weighs only approximately 150 lb. per cu. ft. when cut ready to set. It offers great resistance to extreme heat, and the dielectric strength test is among the highest of all natural stones.

Durability—Specimens of this blue stone have been critically and carefully analyzed by eminent mineralogists and pronounced one of the most durable of all stones. In abrasive tests it excels most other stones. Like all stones, it should be cut to set on its natural bed.

It is said by one who has been in the business all of his life and who has made careful study of the stone edifices in Europe, that this Genesee Valley Blue Stone is very much the same as the stone in the famous stairway of the court in Bargello Palace, Florence, Italy.

Chemical Analysis

Silica	76.50%
Alumina	14.75%
Oxide of iron	6.35%
Water	2.00%
	99.60%

Adaptability—Genesee Valley Blue Stone is a liver rock and does not produce natural split flagging and curbing. It can be fabricated and carved for practically any architectural work. The sheets of stone in these Ambluco quarries, being of unusually low levels, represent early deposits and are, therefore, much harder and more compact than stone quarried from higher levels.

Cutter and Sawed Face Ashlar

Even more artistically effective than seam face granite, cutter face (vertical seam face) blue stone ashlar has been worked into buildings of the early American farm house and English Tudor styles. These cutter faces are permanently and beautifully stained many colors and soft shades, producing an old tapestry design when laid random. Also the combination of sand sawed and shot sawed faces furnishes a pleasing relief from the smooth planed and rubbed finishes.

"North River" Blue Stone

Color, Texture, Etc.—Although nearly uniform in color, slight variations in shades from dark gray blue through blue to purplish dark blue breaks the monotony of a stone of uniform color and eliminates artificial imitations. "North River" Blue Stone is of fine grain and even texture, containing about 78% silica, making the stone non-slip at all times.

Durability—The record of nearly a century of use of "North River" Blue Stone speaks for itself. Authentic knowledge of this blue stone places it ahead of all stones for hardness, enduring and non-slip qualities for use as exterior door sills, steps, platforms, etc.

Specification Suggestions for Exterior Use

Genesee Valley or "North River" Blue Stone should be specified, and to guard against substitution of inferior blue stones, mention this company's name and address as producers.

Specifications should require all blue stone (as well as most other stones) to be thoroughly seasoned and to be cut so as to set on its natural bed, especially when used for grade courses.

The practical finishes, in order of their costs are: Sand sawed; shot sawed; rock face; wet sand rubbed; fine axed (6-cut); horizontally (machine) tooled; and vertically (hand) tooled. These blue stones also take most any finish applied to a natural stone. The sand sawed finish, showing no saw marks, is very uniform and brings out the character of the stones. This is produced by a slow process and does not burn and bruise the surface of a stone as does planing and axing.

*Naturcleft Flagging

A natural split flagstone of definitely known qualities from the finest quarries in New York. Its many soft mellow color tones are unequalled by any other similar material. Specify Naturcleft Flagging as furnished by the American Blue Stone Company, New York, N. Y., and be sure to get the genuine.

Co-operative Service

Our organization, through its members' lifelong experience with blue stone, offers its knowledge in an impartial manner, unbiased by thought of personal profit.

*Registered U. S. Patent Office.

ALBERENE STONE CORPORATION OF VIRGINIA

419 Fourth Avenue, NEW YORK, N. Y.

ATLANTA, GA. BOSTON, MASS. CHICAGO, ILL. CLEVELAND, OHIO FORT WORTH, TEX. SAN FRANCISCO, CAL. NEWARK, N. J. NEW ORLEANS, LA. PHILADELPHIA, PA. PITTSBURGH, PA. RICHMOND, VA. ROCHESTER, N. Y. WASHINGTON, D. C.

QUARRIES AND MILLS AT SCHUYLER, VA.

Alberene Soapstone

Alberene Soapstone, natural quarried stone of medium hardness, blue-gray in color, produced and fabricated for Interior and Exterior Trim of all kinds, including Spandrel Panels, Sills and Stools, Base, Plinths, Door and Window Trim; Fireplace Linings, Hearths and Facing; *Chemical Laboratory Work;* Toilet and Shower Compartments.

Virginia Alberene Stone

Alberene Stone, selected stone of extreme hardness, reserved exclusively for Stair Treads, Landings, Platforms, Borders and Flooring. Its rubbed-finish, highly-toothed surface remains non-slip whether wet or dry. Abrasive tests of Alberene Stone show the highest durability factor on the U. S. Bureau of Standards scale of any natural stone commercially used for these purposes.

Virginia Black Serpentine

A natural stone of the serpentine family. Becoming extremely popular because its polished black surface affords excellent contrasts for modern design. Use of thin sections (⅞ in.) makes for economy, and affords greater depth of reveal. Its high resistance to weather-action makes it desirable for Exterior as well as Interior use. When sand-blasted, the fine tracery of the designs stands out against the polished black surface.

Virginia Tremolite

This stone is also of the serpentine family, but contains larger percentages of the minerals tremolite and chlorite and somewhat less of serpentine. It contains considerably more marking. It is produced in two varieties, one of which polishes to a dark green and the other to a dark blue-gray.

Physical Properties of Alberene

All grades of Alberene Stone are homogeneous and finely granular in all directions, dense and non-stratified, free from cleavage lines, easily cleaned and kept clean. Use of thin sections (⅞ in.) makes for economy. Alberene Soapstone is easily machined—bored, slotted, grooved, tongued, turned—without splitting or chipping.

Color Value of Alberene Shown by Samples

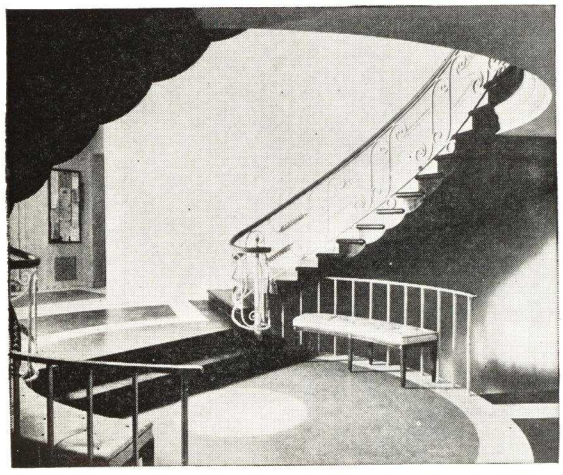
There is a wide variety of tones and textures in these natural stones and we suggest that you send for a copy of "Architectural Alberene," which contains plates in full color. A set of samples, conveniently boxed, showing range of stones, including mottled dark blues and greens, from the Alberene Quarries, will be sent gladly on application.

Typical Spandrel Installations of Alberene Soapstone

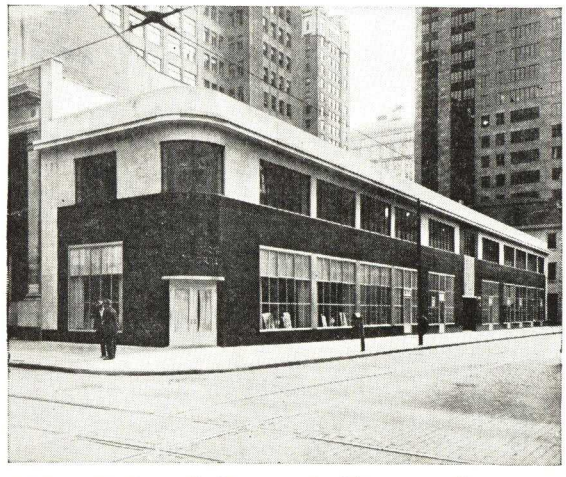
School of Education, New York University, New York, N. Y.; James Gamble Rogers, Architect
Buffalo City Hall, Buffalo, N. Y.; Dietel & Wade and Sullivan W. Jones, Assoc. Architects
Westchester County Office Bldg., White Plains, N. Y.; Morris & O'Connor, Architects
Shillito Store, Cincinnati, Ohio; Potter, Tyler & Martin, Architects
Chronic Diseases Hospital, Welfare Island, N. Y., York & Sawyer; Butler & Kohn, Assoc. Architects

Typical Exterior Installations of Virginia Black Serpentine and Virginia Tremolite Green

Rundell Memorial Library, Rochester, N. Y.; Gordon & Kaelber, Architects
Charity Hospital, New Orleans, La.; Weiss, Dreyfous & Seiferth, Architects
Federal Reserve Bank, Washington, D. C.; Paul P. Cret, Architect
Orange County Courthouse, Orange, Tex.; William Page, Architect
280 Madison Ave., New York, N. Y.; Walker & Gillette, Architects
Central Bank of Grand Rapids, Grand Rapids, Mich.; Knecht, McCarty & Thebaud, Architects
Senior High School, Norristown, Pa.; Davis & Dunlap, Architects
KYW Broadcasting Bldg., Philadelphia, Pa.; Tilden & Pepper, Architects
Central Public Library, Brooklyn, N. Y.; Githens & Keally, Architects



Solid Serpentine Cantilever Treads, Cosmopolitan Club, New York, Thomas Harlan Ellett, Architect. Medal of Honor in Architecture, Architectural League, N. Y.



Tilden, Register & Pepper, Architects, used a veneer of Virginia Black Serpentine for this building in Philadelphia's business center

GRANIDUR PRODUCTS CO.

Manufactured Architectural Granite of Proven Merit

343 South Dearborn Street, CHICAGO, ILL.

REPRESENTATIVES

DETROIT, MICH., Maul Macotta Corp., 1640 E. Hancock Ave.
MILWAUKEE, WIS., Carl S. Hatch, 3347 No. Bartlett Ave.
PHILADELPHIA, PA., The Formigli Corp., Real Estate Trust Bldg.
ST. LOUIS, MO., Marcrome Art Marble & Cast Stone Co., 1200 No. Rockhill Rd.

GRANIDUR

28 Years Experience in Manufactured Granite

GRANIDUR enables the architect to achieve the enduring brilliance and lustre of granite, with economy. Its ready acceptance and use by architects for important projects is evidence that it fulfills a real need. GRANIDUR further offers advantages of construction and design peculiar to itself. GRANIDUR is a manufactured, structural masonry material created primarily for permanent, exterior facing of all types of fine buildings. As such, GRANIDUR retains its high polish and color when exposed to the weather. This highly polished finish is primarily derived from the granite of which it is principally composed.

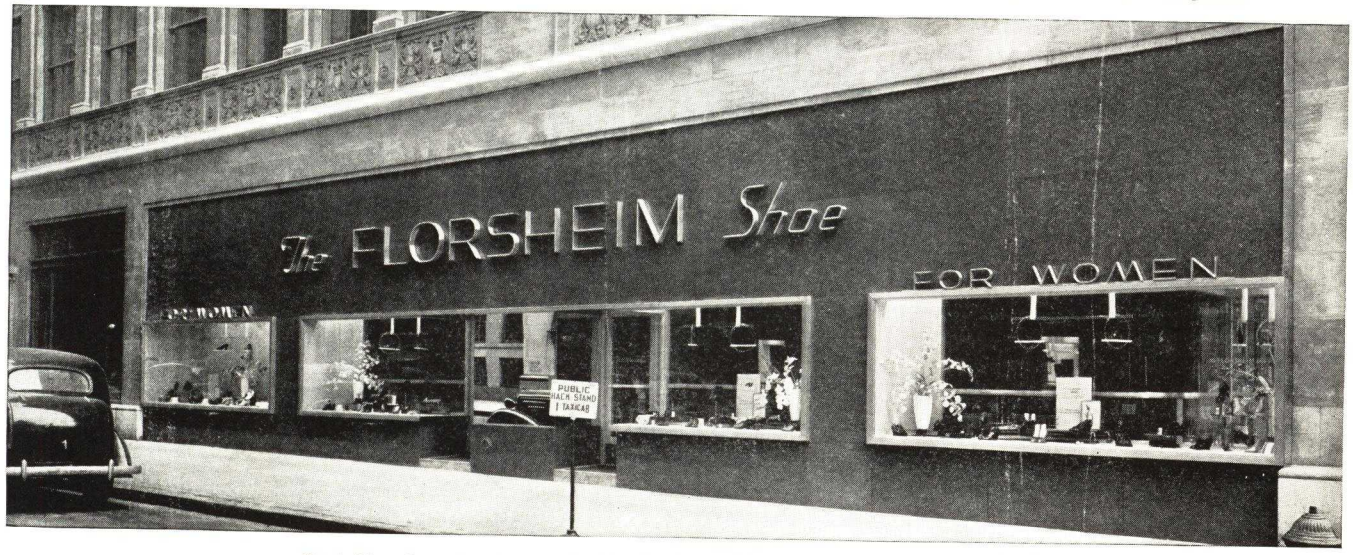
Because of the granite utilized in its fabrication, it is available in practically all colors and textures of granite, as well as many distinctive colors of its own. By means of a special process of manufacture and special bonding agents great density and strength is obtained. Units are fabricated to the size and shape required by the approved GRANIDUR shop drawings. Under normal conditions fabrication requires from two to three weeks.

GRANIDUR is not available in less than 2-in. thickness. Deeper bonds or sections are optional. There are comparatively few restrictions as to size of the units to be furnished, the large, streamlined type of unit being available. Whenever necessary or desirable, GRANIDUR units may be reinforced with steel to serve as structural members e.g. entrance soffits. Lugs, check outs, bolts incorporated in the back face of units, are readily provided, adding little to the cost. This is a decided advantage in the alteration and modernization type of job, as well as for new types of construction now being developed in many localities.

In order to clearly identify and distinguish our product, it is sold under the trademark GRANIDUR. GRANIDUR applies to the superior type of manufactured granite, sometimes referred to as cast granite, which we have been fabricating for many years. Specialized knowledge and experience insure its proven soundness and high standard of execution.

GRANIDUR is erected by marble or granite setters. Cost of erection is practically the same as for marble or granite.

List of installations will be provided upon request.



Opal Blue Granidur, S. E. Cor. 41st Street and Fifth Avenue, New York, N. Y.

Specifications

The manufactured granite as shown or called for on drawings and/or as specified herein shall be "GRANIDUR" as furnished by the GRANIDUR PRODUCTS CO., 343 South Dearborn Street, Chicago, Ill.

The GRANIDUR shall conform to submitted samples. It shall have a highly polished finish on all exposed surfaces. The GRANIDUR contractor shall submit samples for the Architect's approval of color and texture.

Thickness of the GRANIDUR units shall be as indicated on Architect's drawings and approved GRANIDUR shop drawings.

The GRANIDUR contractor shall prepare and submit for the Architect's approval, complete shop drawings, showing sizes of units, sections and dimensions, jointing, bonding, anchoring and all other necessary details. Each GRANIDUR unit shall be clearly identified by a setting number painted thereon; corresponding setting numbers shall be shown on the GRANIDUR erection drawings.

Proper provision for anchoring and hoisting shall be made in the GRANIDUR units.

The GRANIDUR shall be properly reinforced with steel bars or steel mesh when such reinforcement is necessary. GRANIDUR units shall be true to dimensions, in wind, and have clean true edges or arrises.

The erecting contractor shall unload, receipt for, store and erect all of the GRANIDUR covered by this specification, and shall provide and install all anchors. GRANIDUR shall be carefully handled and by such methods as will guard against damage.

All GRANIDUR shall be set in mortar composed of one part portland cement, one part lime, and five parts fine torpedo sand. This mortar shall not be used for tuckpointing. Said units shall be set in strict accordance with the requirements of the GRANIDUR drawings, as approved by the Architect.

Mortar surfaces of each unit shall be sponged with clean water just before setting. Each unit shall be set accurately, true to line, level and plumb, by competent marble or granite setters, with full flushed joints, all anchors properly inserted and all anchor holes filled. Joints shall be raked out ¾ in. for tuckpointing with Kuhl's Pointing Up Composition, obtainable from H. B. Fred Kuhls, Third Avenue and 65th Street, Borough of Brooklyn, N. Y., or with "Pecora" Caulking Compound. Joints shall be slightly concave and shall be brought to a neat, smooth appearance by slicking with jointer.

When ready for tuckpointing, face of the GRANIDUR shall be washed with water and soap powder, using a fiber brush. The use of an acid or salt solution is prohibited. Consult GRANIDUR contractor before proceeding with cleaning and pointing.

All GRANIDUR shall be properly protected against damage until completion of the entire work.

Specify Granidur to be Sure

CAST STONE INSTITUTE

"Devoted to Improving the Quality and Usefulness of Cast Stone"

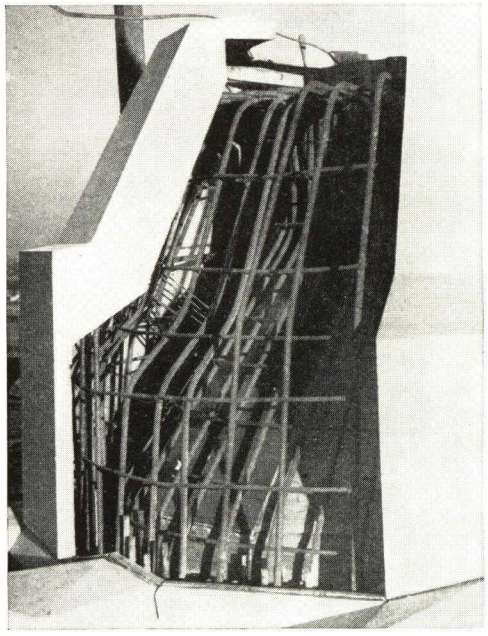
33 West Grand Avenue

CHICAGO, ILL.

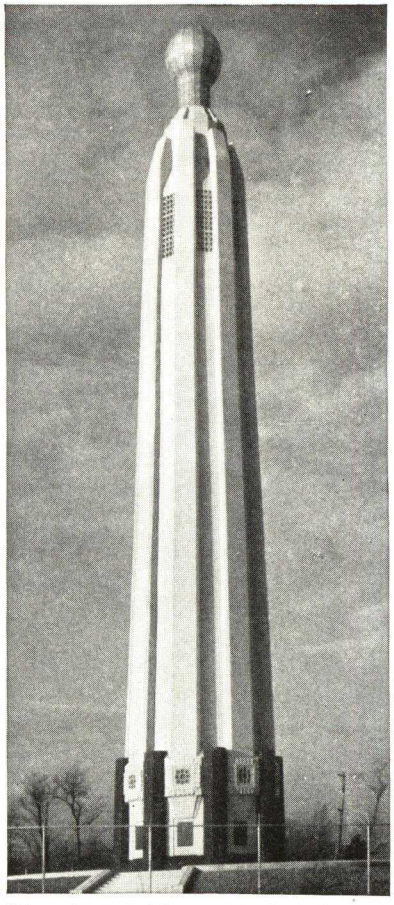
DISTINCTIVE FINISHES FOR CONCRETE STRUCTURES

Cast Stone Slabs Used for Decoration Also Act as Forms

The 130-ft. tower recently erected at Menlo Park, N. J., as a memorial to Thomas A. Edison is another example of the growing use of cast stone as forming for structural concrete when a special decorative treatment is desired. The tower is in the form of a pyramidal octagon with ribs at each corner. The precast slabs are 2¼ in. thick and 10 ft. long by the full width of the side of the octagon or the full perimeter of the rib. As will be seen from the illustrations, the requirements of the job involved the molding of units of very unusual and intricate shape. The construction was carried on by first erecting the inside form and placing the reinforcement. Slabs were then set and the wall ties adjusted from the interior through holes left for that purpose in the inside form. Joints were spaced by continuous strips of compressed cork which expanded upon becoming wet and helped to seal the joints. As a further precaution against leakage, the joints were calked temporarily from the face with strips of burlap. Concrete was placed in 10-ft. lifts, being deposited at the rib openings and worked sidewise into the space between. After the details of the job procedure were worked out, construction went forward rapidly.

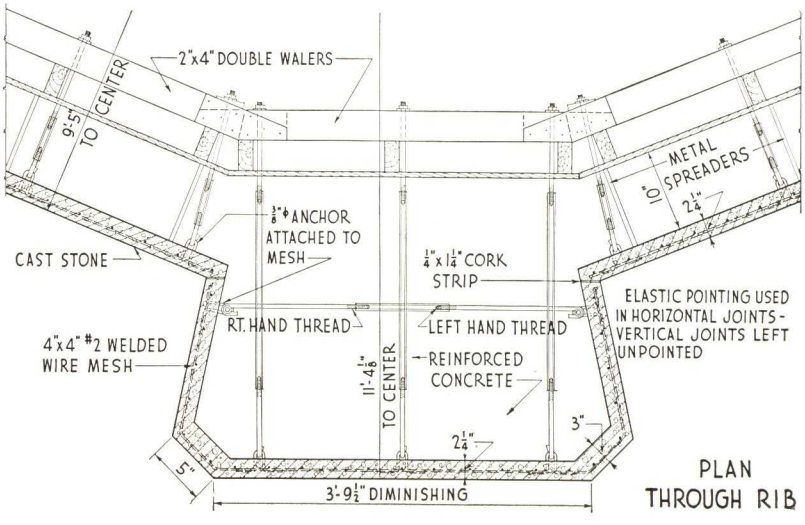


Section of wall at top of tower before being closed in with cast stone slabs, showing inner forms and reinforcement in place



Edison Memorial Tower, Menlo Park, N. J.
Massena & Du Pont, Architects
Walter Kidde Constructors, Inc., Builders

The precast slabs were made with a facing of special aggregate exposed by brushing. The color is graduated from black at the bottom through yellow to white at the top blended with blue to harmonize with the color of the large glass lamp. As was so well illustrated on this job, cast stone slabs of this type used as forms is a highly practicable solution of the problem involved in obtaining special surface textures and colors in concrete used for architectural purposes. This same method, involving more than 140,000 sq. ft. of 2-in.-thick slabs made with a facing of white quartz, is being used on the all-concrete structures of the Naval Experimental Model Basin near Washington.



PLAN THROUGH RIB

HOW TO OBTAIN BEST RESULTS WITH CAST STONE

1. *Specify exactly what is wanted.*
2. *Demand exactly what is specified.*

The excellence of cast stone depends upon the knowledge, experience and carefulness of the manufacturer who makes it. These attributes of the manufacturer are generally reflected in the physical properties of his product and these in turn are easily determined by simple tests. Architects thus have a convenient and reliable means for specifying and measuring the quality of cast stone used in their work. The specification given below sets forth as briefly as possible the basic requirements for securing a good job of cast stone.

Manufacturer

Cast stone shall be the product of an established manufacturer whose material has previously been used in similar work with satisfactory results. Cast stone on which all the requirements of this specification are not fully met will not be considered.

Physical Quality

Cast stone shall have a compressive strength of..... [*see note (a)*] lb. per sq. in. and an absorption not greater than..... [*see note (a)*] per cent when tested in accordance with the requirements of the *American Concrete Institute Tentative Specification P-3-A-29T.* The cast stone shall contain not less than three parts of aggregate to each part of cement by volume.

Color and Finish

Unless otherwise shown on the drawings, the color of the cast stone shall be ..... [*see note (b)*] and all exposed surfaces shall have a.....[*see note (b)*] finish.

Workmanship

All pieces shall be true to dimensions and profiles with sharp, straight edges. Mouldings and arrises shall be sharp, true and continuous at the joints. All ornamenation shall faithfully reproduce approved models or details.

Curing

All cast stone shall be properly cured and seasoned and shall possess the specified physical properties when delivered to the building site. [*See note (c)*]

Samples

Each cast stone manufacturer bidding on this work shall submit to the architect for inspection before general bids are due a sample of the cast stone which he proposes to furnish, together with report of tests on cast stone certified to be of similar quality and a list of at least three representative jobs comparable to the work covered by this specification.

Tests

The architect may select or cause to be selected at random from the job representative pieces of cast stone for testing. Tests shall be made at the manufacturer's expense and pieces of cast stone taken for testing shall be replaced by the manufacturer without charge. [*See note (d)*]

Notes

(a) Since there are different grades of quality in cast stone, its physical properties should be specified according to requirements of the job. In no event should compressive strength be less than 5000 lb. per sq. in. nor absorption more than 7 per cent. Cast stone having a compressive strength of 10,000 lb. or more per sq. in. and an absorption of 6 per cent or less is commercially available. For a discussion of the relationship between the general excellence of cast stone and details of manufacture, architects are referred to *Cast Stone Service Bulletin CS-18A.*

(b) Color and finish should be specified clearly, and if possible, on the basis of an actual sample. Members of the Institute will be glad to submit samples for consideration when designs requiring special colors or finishes are being developed.

(c) Curing and seasoning are an important part of the manufacturing process. All possible time should be made available for these through early award of the subcontract and prompt return of shop drawings.

(d) Members of the Cast Stone Institute are required to maintain an average compressive strength of at least 5000 lb. per sq. in. in their product. Periodic tests are required on specimens truly representative of each member's cast stone taken from actual jobs. As a service to its members, the Institute maintains facilities for doing the required testing, and furnishes reports to them as a matter of record and as a source of up-to-date information on the quality of their material. Architects may arrange with a member of the Institute to have these requirements on periodic tests applied to cast stone which is furnished for a specific job.

Services of the Institute

The Cast Stone Institute is continuously working with its members in the field and in the laboratory to improve the quality of cast stone and to increase its usefulness. For its members the Institute conducts original research and maintains facilities for making various physical tests on cast stone. For the benefit of architects and designers it issues bulletins giving information on the natural characteristics and proper uses of cast stone and its application as a form of architectural concrete. The Institute invites inquiries on specific problems involving cast stone.

Cast Stone Service Bulletins

CS- 1A Copings and Coping Joints
CS- 3A Spandrels—Window and Parapet
CS-12A Stairways
CS-13D Details—Knickerbocker Laundry
CS-13E Details—Wichita Art Institute
CS-13G Details—Oceanside High School
CS-14A Remodeling (Store Fronts)
CS-15B Cast Stone Made with Manufactured Colored Aggregate
CS-17C Tentative Specification for Colored Ceramic Aggregate
CS-18A Factors Determining Quality in Cast Stone
CS-19A Cast Stone as Forming
CS-19B Cast Stone as Forming—Nemours Carillon Tower

AMERICAN TERRA COTTA CORPORATION

Builders Building, CHICAGO, ILL.

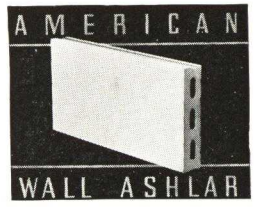
TELEPHONE
FRAnklin 1467

FOUNDED 1881

AGENCIES IN PRINCIPAL CITIES

Indianapolis Terra Cotta Company, Inc.
2228 North Olney Street, INDIANAPOLIS, IND.

Architectural Terra Cotta

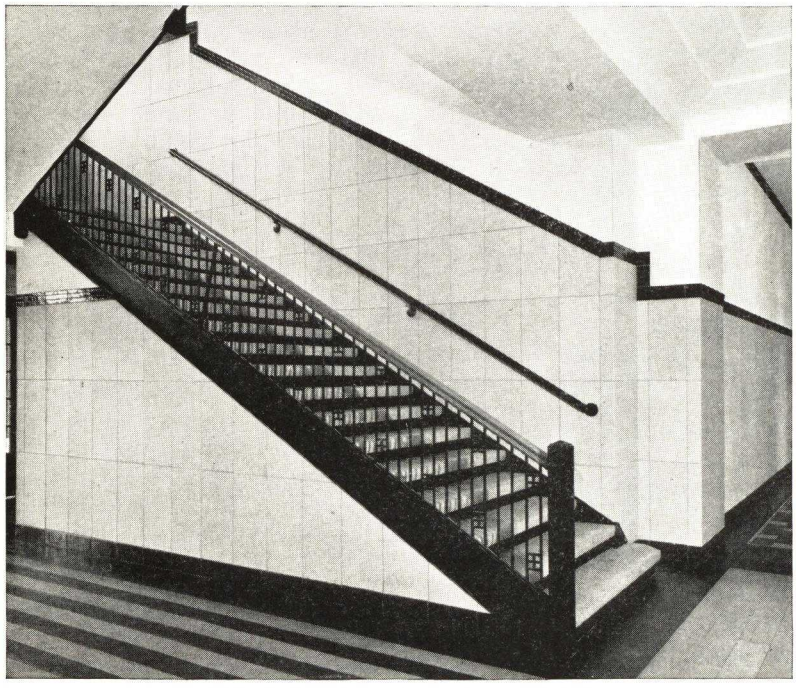


American Terra Cotta is available in any variety of shapes and designs, plain and decorative with the added advantage of unlimited choice in permanent ceramic colors and finishes. Through its use the architect can give the most diversified expression to his conceptions of both form and color. All American Terra Cotta Products can be furnished in unglazed, non-reflecting glaze or bright glazed ceramic finishes in plain, mottled or polychrome effects. Two-burn colors, such as Brilliant Red, Ceramic Gold and Ceramic Silver are also available.

American Terra Cotta Wall Ashlar

American Terra Cotta Wall Ashlar is extruded from dies in standard shapes and offers a distinct price advantage where plain wall surfaces predominate. It can be furnished in the same wide range of ceramic colors, and is suitable for both exterior and interior walls either as a veneer or a load-bearing wall. Each unit is ground on all edges to assure uniform joining. Standard units are 8 x 16¼ in., 12 x 20 in. and 18 x 24 or 36 in. and 2, 4 or 6 in. in thickness, with solid back, scored for plaster or for bonding with brick or tile. Cove base, cap mouldings, mitres and special shapes are furnished as required.

American Wall Ashlar is particularly well adapted for store fronts, service stations, lobbies, stair halls, corridors, laboratories, etc., where appearance, permanence and sanitation are essential.



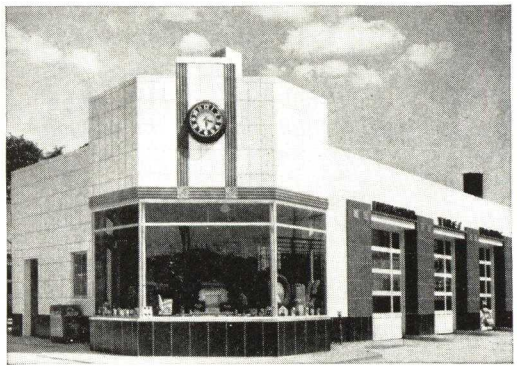
Thomas A. Edison School, Hammond, Ind.
Wm. S. Hutton, Architect
E. W. Sproul Construction Co., Contractor
Wainscots of stair halls and corridors are American Wall Ashlar in large scale 12x24-in. units. Color, mottled buff cream with base and cap in dark mottled brown

Other Products

Swim Pool Rails, and Pool Lining; Fire places; Garden Pottery; Decorative Pottery; Chimney Pots.

Information, Prices and Literature

Technical information about our products will be furnished upon request; for prices, send us plans and specifications; write for catalogues of American Wall Ashlar, Garden Pottery and Chimney Pots.



Service Station, B & P Finance Co.
Greenwood and Sherman Avenues, Evanston, Ill.
Harold Anderson & Associates, Architects
J. Emil Anderson & Son, Contractor
Effective use of American Wall Ashlar in Service Stations. Colors dark blue, powder blue, white and ceramic gold

Representative Installations of American Wall Ashlar

Memorial Union, Univ. of Wis., Madison, Wis., Corbett & MacMurray, Architects

Gov't Printing Office Annex No. 3 Washington, D. C., L. A. Simon, Supv. Architect

Memorial Auditorium, Burlington, Iowa, R. B. Carswell, Architect

Sewage Treatment Plant, Detroit, Mich., Dept. of Pub. Works, Architect

Buhl Planetarium, Pittsburgh, Pa., Ingham & Boyd, Architects

Pulaski High School, Milwaukee, Wis., Guy E. Wiley, Architect

Museum of Science and Industry, Chicago, Ill., Graham, Anderson, Probst & White, Architects

St. Mary's Hospital, Decatur, Ill., Helmle & Helmle, Architects

S. H. Kress & Co., Ashland, Ky., Edward F. Sibbert, Architect

Senior High School, Richmond, Ind., John L. Hamilton, Architect

Stadium Theatre, Evanston, Ill., J. E. O. Pridmore, Architect

Senior-Junior H. S. Addition, Wauwatosa, Wis., Herbst & Kuenzli, Architects

Valentine Boys Club, Chicago, Ill., Childs & Smith, Architects

Talco School, Talco, Tex., Voelcker & Dixon, Architects

Fort Sackville Theatre, Vincennes, Ind., Schucker & Bixby, Architects

ATLANTIC TERRA COTTA COMPANY

101 Park Avenue, NEW YORK, N. Y.

PLANTS: PERTH AMBOY, N. J.; TOTTENVILLE, S. I., N. Y.; ROCKY HILL, N. J.

REPRESENTATIVES IN MOST PRINCIPAL CITIES

ATLANTA TERRA COTTA CO., East Point, Ga. SOUTHWESTERN DISTRICT OFFICE: 720 No. Bishop Ave., Dallas, Tex.

Atlantic Architectural Terra Cotta

A building material for exterior and interior construction and decoration, made in ashlar and any form of modeled and sculptured ornament and in any color or combination of colors.

Atlantic Terra Cotta is permanent, fire resistant, light in weight, economical in cost and possesses great insulation value against heat, cold and sound. It is used for the complete exterior of a building or for the spandrels, entrances, parapets, copings, cornices, decorative inserts—wherever permanence, and beauty of color is wanted.

Established 1846

Colors

The use of color is one of the tenets of modern architecture and Atlantic Terra Cotta can be obtained in any color that may be desired—pastel shades, brilliant faience and rich mottled abbochromes.

Chimney Pots of Atlantic Terra Cotta

Reproductions of Tudor, Elizabethan and Georgian models, unique in the fact that they are obtainable in any desired color. There are 31 standard designs in a complete range of flue sizes. Special designs made to order.

Interior Machine Made Units of Atlantic Terra Cotta

Mechanically made de-aired terra cotta units used for the construction and facing of interior walls and partitions. Obtainable in 5x8, 5x12, 6x9, 8x16, 9x14 in. and larger sizes in thicknesses of 1, 2, 3, 4 and 6 in. Necessary base, cap, mitres, jamb, sill and lintel units are available. Made with closed backs either scored to take plaster or with a smooth surface. Each unit ground to size and squared, assuring perfect jointing and economical erection.

Machine Made Closed Back Wall Ashlar for Exteriors

Mechanically made de-aired terra cotta ashlar for exterior facings obtainable in sizes 12x24, 15x15, 18x36, 20x40, 22x44, 24x24 and 24x48 in. These machine made units, together with necessary hand-made moulded and ornamental features working with them, are made with closed back requiring no filling with brickwork, grout or mortar. All units are face planed before firing, producing even surfaces in true plane. Each unit ground to size and squared before shipment, assuring perfect jointing.

Atlantic Roof Tile

Classic pan and cover glazed roof tile in color of suitable scale for monumental buildings, as used on the Pennsylvania Museum of Art, Philadelphia, Pa.; the State Capitol at Charleston, W. Va.; the new United States Supreme Court, Washington, D. C., and the gold pyramid roof of the new United States Courthouse, New York, N. Y.

Garden Pottery of Atlantic Terra Cotta

Reproductions of rare and artistic urns, jars, pedestals, fountains, etc. Available in all Atlantic colors and finishes. Atlantic Pottery is used not only in gardens but also as decorative furnishings for lobbies, loggias, etc. Special designs made to order.

Literature

Illustrated booklets and folders for every building requirement can be furnished by the ATLANTIC TERRA COTTA COMPANY. Issued at intervals is our magazine Atlantic Terra Cotta, containing illustrations of the finest Atlantic installations in contemporary architecture.

Any of the above as well as Catalog of Chimney Pots, Garden Pottery, Roof Tile and other specialties will be furnished on request.

A PARTIAL LIST OF BUILDINGS RECENTLY COMPLETED OR NOW BEING ERECTED USING ATLANTIC TERRA COTTA

Exterior Installations

F. W. Woolworth Store, Fifth Ave. and 39th St., New York City.
Starrett & Van Vleck, Architects.

F. W. Woolworth Stores: Newburgh, N. Y.; White Plains, N. Y.; Albany, N. Y; Buffalo, N Y.; Miami, Fla.; Philadelphia, Pa.; Danbury, Conn.; Worcester, Mass
Company's Architects.

S. S. Kresge Co., N. Pearl and James Sts., Albany, N. Y.
Company's Architects and J. H. Barry.

S. H. Kress: Fort Worth, Tex.; Birmingham, Ala.; Alexandria, La.; Miami, Fla.; El Paso, Tex.
E. F. Sibbert, Architect.

Gulf Oil Corporation Stations: Forbes and Murray Sts., Pittsburgh, Pa.; Albany and Ventnor Aves., Atlantic City, N. J.; 13th and N Streets, Washington, D. C.; York Rd. and Woodburne Ave., Baltimore, Md., and many other locations.
Company's Architects.

Coca Cola Bottling Plant, Hickory, N. C.
Henry I. Gaines, Architect.

Medical and Clinical Bldgs., Medical Centre, Jersey City, N. J.
John T. Rowland, Architect.

U. S. Post Offices:
New Rochelle, N. Y.
Fred'k G. Frost, Hart & Shape, Architects.
Ridgewood, N. J.
L. A. Simon, U. S. Treas Dept; R Stanley-Brown, Consltg. Architect.
Forest Hills, N. Y.
L. A. Simon, U. S. Treas Dept.; Lorimer Rich, Architect, and many others.

New York Exhibition Building, World's Fair, Flushing, L I.
Aymar Embury II, Architect. (Exterior and Interior.)

Manhattan Ventilation Building, Queens Midtown Tunnel, New York City.
New York City Tunnel Authority, Architects.

Neiser Bros. Stores: Springfield, Mass.; Buffalo, N. Y.
Company's Architects.

Interior Wall Unit Installations

Cathedral of Learning, University of Pittsburgh.
Charles Z. Klauder, Architect.

Public Schools, City of New York.
W. C. Martin, Architect.

Trinity College, Hartford, Conn.
McKim, Mead and White, Architects.

Jr. High School, East Orange, N. J.
Kramer and Behee, Architects.

University of Texas Library, Austin, Tex.
Paul P. Cret, Architect.

Columbia University Library, New York, N. Y.
James Gamble Rogers, Architect.

Laboratories, E. R. Squibb & Sons, New Brunswick, N. J.
Sherley W. Morgan, Architect.

Jacob Riis Park Bathhouses, Queens, L. I., and many others.
New York City Dept. of Parks, Architects.

Coca Cola Bottling Plant, Dallas, Tex.
Robert & Co., Atlanta, Ga., Architects.

Baroness Erlanger Hospital, Chattanooga, Tenn.
Schmidt, Garden and Erickson, Architects.

CONKLING ARMSTRONG TERRA COTTA CO.

SALES OFFICE AND FACTORY

Wissahickon Avenue and Juniata Street

PHILADELPHIA, PA.

AGENCIES IN PRINCIPAL CITIES

ARCHITECTURAL TERRA COTTA — MACHINE-MADE TILE WALL UNITS — GARDEN POTTERY

Store, Spalding Avenue, Baltimore, Md.
JOHN F. EYRING, Architect

At the left is shown an attractive and modern store front faced with Terra Cotta in several colors.

The pilasters, parapet features and coping are handmade material in polychrome of sufficient color contrast but in harmony with the general field color.

Base and lintel courses and field ashlar are composed of our machine-made tile in units of 8 x 17 and 12 x 17 ins.

Colors used were mottled black and mottled buff, respectively.

In the Philadelphia Convention Hall, corridors are built of our 8 x 16-in. units, 4-in. bond, glazed on the corridor side and plastered on the office side to form a complete partition wall.

Vestibules are faced with our 8 x 16-in. units, 4-in. bond.

Base course throughout is 12 ins. high, furnished in a dark green mottled color and the tile facing above in a warm light buff mottled tone.

Ten shades of high fired ceramic glazes were used in the polychrome treatment of the ornamented portions.

Our machine-made Tile Wall Units in 1, 2 or 4-in. bond are unsurpassed for exterior facing of new fronts or for the re-surfacing of old fronts, and for interior facing of walls, corridors, wainscots, etc., especially where absolute sanitary conditions are desirable.

Consult us, without obligation, for data on construction and color treatment.

Convention Hall, Philadelphia, Pa.
PHILIP H. JOHNSON, Architect

Estimates Furnished from Architects' Plans and Specifications or from Graphic Sketches

EASTERN TERRA COTTA COMPANY

TELEPHONE
STillwell 4-7400

401 Vernon Avenue
LONG ISLAND CITY, N. Y.

PLANTS: OLD BRIDGE, N. J. and LONG ISLAND CITY, N. Y.

Being formerly the plants of NEW YORK ARCHITECTURAL TERRA COTTA COMPANY

Products

ARCHITECTURAL TERRA COTTA: Hand made, for both exteriors and interiors.

MACHINE MADE TERRA COTTA ASHLAR, SILLS, COPINGS, MOULDINGS, etc.

TERRA COTTA WALL-TILE.

BAS-RELIEFS and SCULPTURED TERRA COTTAS in polychrome or monotone colors.

Also Vases, Garden Ware and Chimney Pots.

Quality

For more than fifty-one years the EASTERN TERRA COTTA COMPANY personnel has manufactured terra cotta of the highest quality only. Its product meets the most exacting requirements of architect and owner.

Service

EASTERN TERRA COTTA COMPANY has at its command most complete facilities for the rendering of steady and dependable service to its customers.

Color

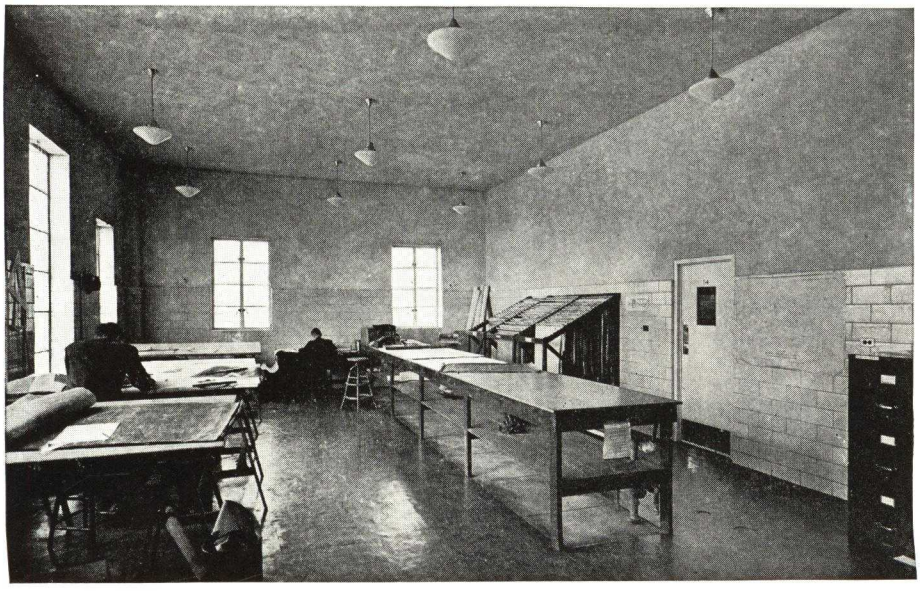
Ceramic colors and finishes of proved merit cover such a wide range that the variety of selection presented to architect and owner is almost limitless. EASTERN TERRA COTTA COMPANY presents the results of more than fifty-one years of constant research in this department. EASTERN TERRA COTTA COMPANY applies these ceramic finishes to terra cotta which has been fabricated to outlast the building of which it will form a part.

Fundamentals

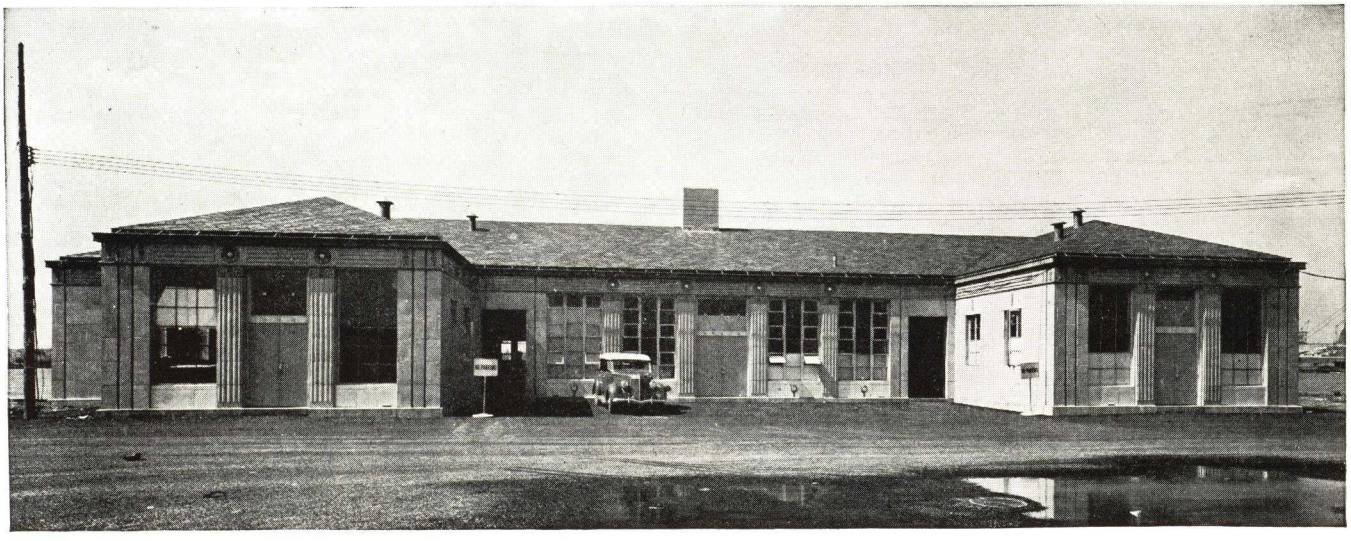
Only the highest grade of selected clays, scientifically mixed and thoroughly pugged, tempered and aged, enter into the construction of Eastern Terra Cotta. With solidly pressed faces, sides and ends, all of honest thickness, and with heavy struts adequately placed, each piece of Eastern Terra Cotta has fabricated into it the guarantee of permanence.

Specifications

Detailed specifications furnished upon request.



Glazed Terra Cotta Wainscot—Interior of Boat House, New York World's Fair, 1939
AYMAR EMBURY 2ND, Architect



Architectural Terra Cotta Facing—Complete Exterior of Boat House, New York World's Fair, 1939
AYMAR EMBURY 2nd, Architect

FEDERAL SEABOARD TERRA COTTA CORPORATION

10 East 40th Street, NEW YORK, N. Y.

FACTORIES

PERTH AMBOY, N. J. WOODBRIDGE, N. J. SOUTH AMBOY, N. J.

United States Post Office, Rahway, New Jersey

The FEDERAL SEABOARD TERRA COTTA CORPORATION has manufacturing experience of over half a century, with three large factories favorably located, properly organized and equipped with the most modern machinery for the economic production of Architectural Terra Cotta in the form now demanded by modern architecture.

A research department fully abreast of the requirements of the times is maintained. New and important developments are constantly under way.

Federal Seaboard Terra Cotta products are, necessarily, briefly described herein. Full information, color samples, and specifications covering the various products will be promptly sent upon request.

The aesthetic and functional qualities required by modern architecture demand:

FORM — COLOR — TEXTURE

Form—Architectural feature or decoration is produced in plaster of paris or clay models made by our Staff Artists, or furnished by the purchaser. Photographs of decorative models are submitted to the Architect for approval or the models may be inspected at our factory. The reproductions are pressed in plaster of paris moulds economically, particularly so when there is a substantial repetition of units.

Color—An almost unlimited range of permanent, brilliantly lustrous or matt glazed and unglazed colors are available, fired to 2250°F. or more. They are permanent to the utmost degree, acid-resisting, impervious to moisture, and will not fade or discolor.

Polychrome—Decorations in relief may be further emphasized by hand application of polychrome in glazed colors or, where absolute flatness is desired, colored decorations in polychrome are economically and artistically applied by the use of stencils.

Noble Metal Finishes—Gold, silver, and brilliant red surface finishes are produced by a second firing of the terra cotta at a temperature governed by the melting heat of the metals employed, usually 1200 to 1300°F.

Applied Metals—Metals such as aluminum, tin, bronze, lead, etc., are fused on the surface of the terra cotta at extreme heat by the oxy-acetylene process. The surface so produced has all the qualities of the metal employed plus the advantage of being fused on a substantial, non-corroding terra cotta base.

Texture—It is possible and economical to produce practically any desired surface texture on the plastic clay. Further, glazes applied by the multichrome process, mingling two or three different glaze colors or different shades of the same color, produce an interesting surface color texture.

Permanence—Architectural Terra Cotta is the one outstanding, permanent, first grade building facing material—created at a heat which would destroy most materials, it is fire resisting to the highest possible degree and an occasional washing with soap and water brings it back to its original freshness of color.

Use—Terra Cotta may be used as a facing for the entire facade or for architectural trim—for new buildings or for modernizations. In new work, terra cotta may be bonded to the brick or applied, in thickness of 1¼ in. upward, as a permanent veneer over concrete or masonry.

Terra Cotta is used to provide architectural or color interest in conjunction with other facing materials, such as granite, stone, glass, brick, or like mediums. Where carving costs, for instance in granite, are found prohibitive, terra cotta, harmonizing closely in color, texture, and carving technique, is often used with great economy.

Remodeling—Due to improved manufacturing processes, it is now possible to economically reface an existing building over brick or concrete with a thin terra cotta slab, from 1¼-in. thickness upward, providing a permanent, modern facade for an outmoded store or a building which has lost its former rental value.

Production—While architectural terra cotta is largely produced by hand, certain features, such as large ashlars, are extruded through machines under great pressure. Surfaces of such materials are machine planed before firing, providing large, straight ashlar of interesting texture.

Specifications — Write for detailed specifications on: (1) Architectural Terra Cotta; (2) Architectural Terra Cotta Wall Ashlar; (3) Remodeling Construction; (4) Seepage Bar; (5) Planed Surfaces; (6) Veneer Construction — or any other data you may require. This will be furnished you promptly, without charge.

WALL ASHLAR

Federal Seaboard Architectural Terra Cotta Wall Ashlar is produced in all sizes to provide high grade walls, veneer or self-supporting, glazed on both sides, or scored on the back to receive plaster or for the usual bonding with brick or hollow tile.

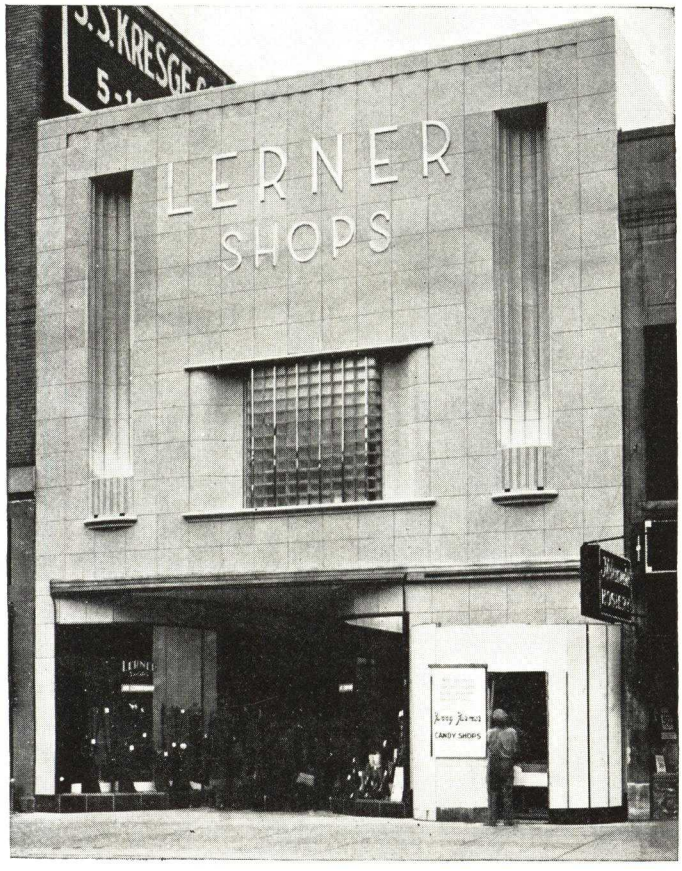
The universal acceptance of this quality product by architects, engineers, and building owners is shown by their expressions of approval of many completed installations.

Dimensions—Federal Seaboard Standard Wall Ashlar is, when desired, automatically and accurately ground to size, usually 8 in. x 1 ft. 4¼ in. or larger, thus providing proper architectural scale, and eliminating the excess of large unsightly joints characteristic of smaller units. Smaller sizes (from 5 in. upward) unground are produced for construction where larger and somewhat irregular joints are not considered objectionable.

Proposals—We furnish lump sum proposals for the terra cotta required based on Architect's scale drawings, sketches, or other information available.

Albany Avenue School, Freeport, L. I., N. Y.

Write for specifications and data covering Architectural Terra Cotta Wall Ashlar or specify that all Architectural Terra Cotta Wall Ashlar shall be as produced by the Federal Seaboard Terra Cotta Corporation.



Lerner Store, Flint, Mich.

AMERICA'S GREAT MERCHANDISERS BUILD WITH ARCHITECTURAL TERRA COTTA

Solid Slab Enduro Ashlar is the modern Architectural Terra Cotta. Extruded under great pressure in slabs approximately 2 in. thick, it is face planed before firing to a flat, straight surface eliminating the objectionable surface waviness inherent in so many other facing materials. Enduro Ashlar may be used as a veneer to reface, economically, an existing building providing a permanent, modern facade.

Solid Slab Enduro Ashlar, 2 in. thick may be had in sizes from 12 to 24 in. wide and up to 36 in. in length. Larger slabs with voids may be had in the 4-in. thickness.

Write for specifications and data covering Enduro-Ashlar for remodeling and specify all Enduro-Ashlar shall be as produced by the Federal Seaboard Terra Cotta Corporation.

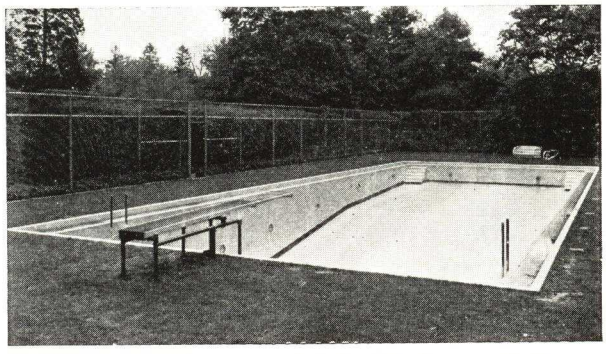
GLAZED TERRA COTTA

For out and indoor swimming pools, scale of jointing is of prime importance. Impressive pools in outdoor setting are constantly being built with Federal Seaboard terra cotta using special deep blue, jade, and green glazes, properly harmonizing with the landscaping.

Federal Seaboard glazed terra cotta for swimming or wading pools is specially produced to function properly under prevailing climatic conditions. With its special, scientifically prepared body, fired to a heat of more than 2250° F., hard glaze colors are produced having maximum efficiency in resisting contamination and *easily kept clean with a minimum of labor and supply costs.*

Scum gutters, seat rims, steps and other pool fittings are, when desired, produced in glazes with slip resistant surface.

Terra cotta sand jars, vases, garden seats, etc., also walls for shower and dressing room structures, in Federal Seaboard terra cotta wall ashlar are made to match the glaze colors of the pool.



Mrs. Eleanor Patterson's Pool, Port Washington, N. Y.

Write for specifications and data covering in and outdoor swimming pools or specify that Architectural Terra Cotta for swimming pools shall be as produced by the Federal Seaboard Terra Cotta Corporation.

ESTABLISHED 1810

GALLOWAY TERRA COTTA COMPANY

3200 Walnut Street
PHILADELPHIA, PA.

GALLOWAY POTTERY

Products

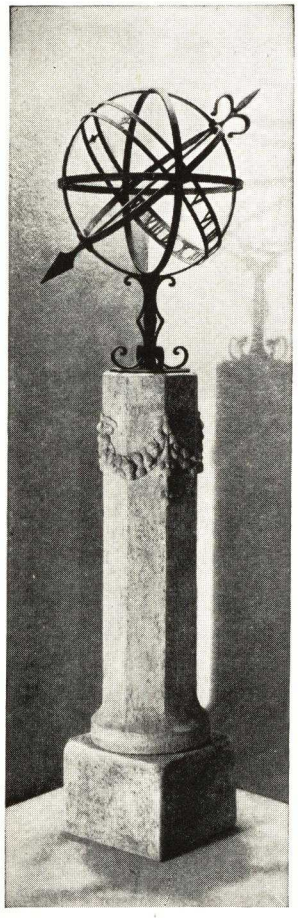
GALLOWAY GARDEN and DECORATIVE POTTERY and TERRA COTTA including: Flower Pots, Boxes, Vases, Bird Baths, Sun Dials, Tables, Benches, Hermes and Statuary. Also Architectural Terra Cotta. Since 1810 our organization has been making Pottery and Terra Cotta of various kinds and is now specializing in Garden and Decorative Wares.

Catalogue of Garden Pottery and schedule of Chimney Pots will be sent upon request.

Finishes

Our high fired strong and durable terra cotta is made unglazed and glazed. The light stony gray is the popular finish in the unglazed, although reds, buffs, etc., are also made. Glazes usually range through the blue-green and turquoise, but almost any shade can be made on order.

Special forms can be turned and quotations will be made upon sketches and details.



Left:

Armillary Sphere Sun Dial

16-in. diameter on No. 196 Pedestal.
Over-all height, 60 in.

Below:

No. 403 Jar

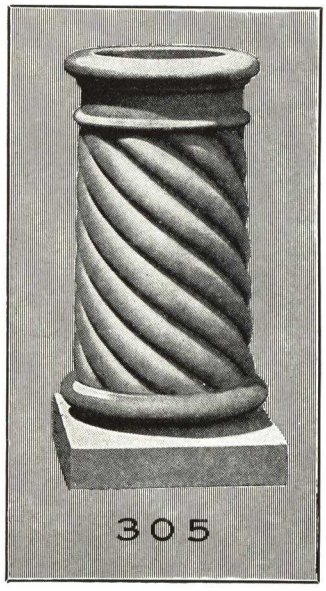
22 in. high

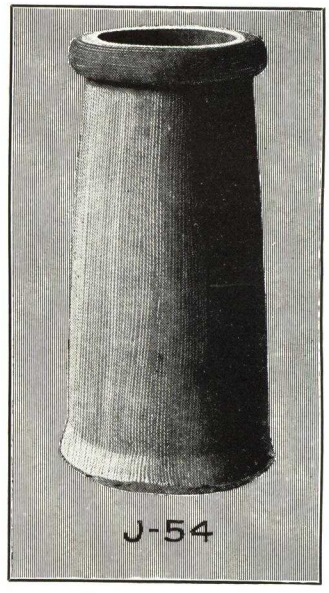
Below:

Sand Jars

The two classic forms shown were executed from drawings of SMITH, HINCHMAN & GRYLLS, architects for the Horace H. Rackham School, University of Michigan.

We have many stock patterns to offer.



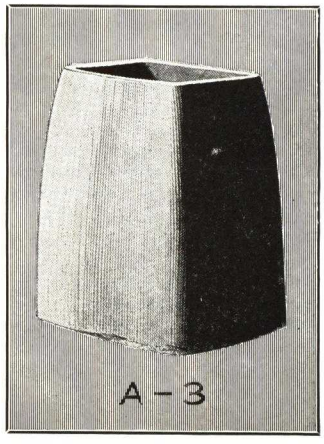


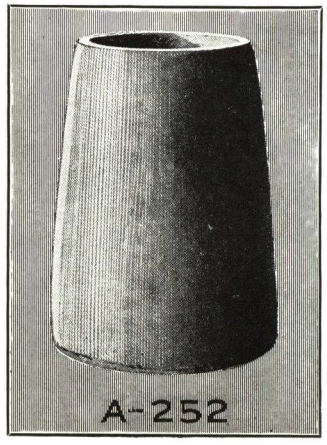
Galloway Handmade Chimney Pots

Made to fit standard flue linings. Special sizes and designs will be executed on order.

Color—Medium red is the stock finish, but gray, buff, and special colors will be made.

Orders—Stock is maintained in standard sizes but orders placed well in advance of your needs will prevent unnecessary and costly delays.





BUILDERS' CUSHION JOINT CO.

208 North Wells Street
CHICAGO, ILL.

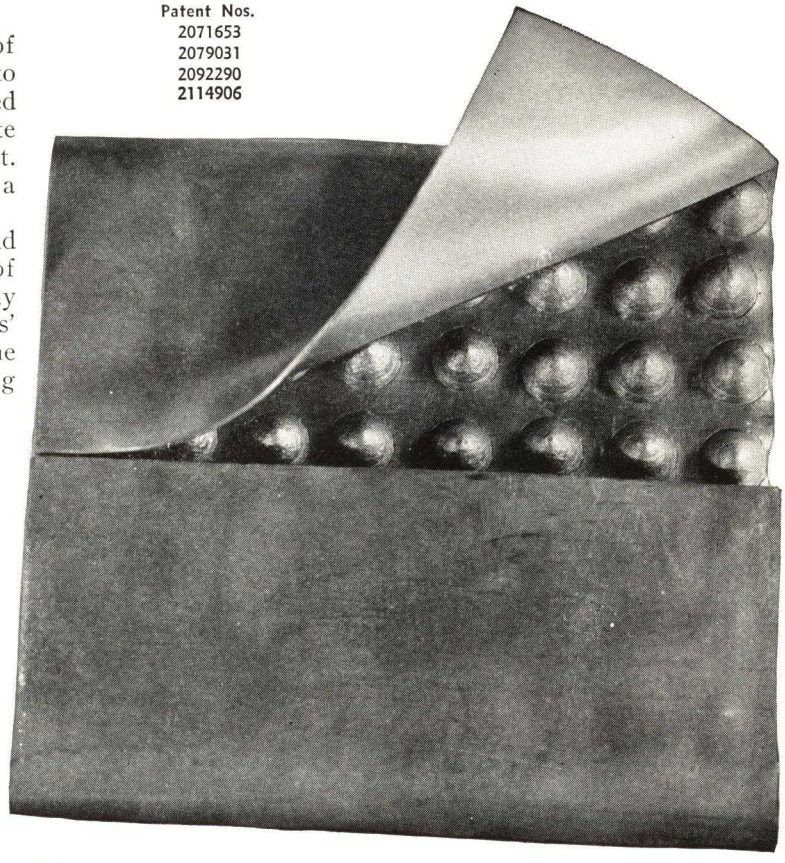
TELEPHONE
ARDMORE 3300

Material

A sheet of lead incorporating a plurality of raised portions from that sheet and folded onto itself. The raised portions are of any desired height, generally of sufficient thickness to create a joint of equal thickness to the mortar joint. The purpose of the fold being to produce a watertight course.

This material comes in any desired width, and is delivered on the job cut to fit the profile of each individual pier, thereby eliminating any additional expense in setting. The Builders' Cushion Joint is of sufficient strength to carry the normal weight expected to occur on the facing units.

Patent Nos.
2071653
2079031
2092290
2114906



Purpose

In all buildings of stone, terra cotta, granite or marble facades certain destructive movements occur which cause the facing blocks to crack or spall. These movements include: the compression of steel, the expansion of stone due to temperature change, wind-stress, settlement, and vibration. These conditions are frequently aggravated by faulty setting. To overcome any disastrous results from the above movements the Builders' Cushion Joint has been developed to incorporate a feature of elasticity into the wall which may not be obtained as well in any other manner. When the excessive weight is placed on the facing blocks there is relief provided simply by the raised portions of the Builders' Cushion Joint being forced down, which automatically restores the desired, intended weight to the facing material. With the use of the Builders' Cushion Joint the building is zoned into story heights. Where the stones are bonded onto the floor or in the use of shelf angles, this material permits these types of construction to function as intended by assuring, for the life of the building, that the weight of the facade will rest on either the angle iron or the floor. *Another necessary feature is the elimination of the majority of all future tuckpointing.*

Compression Test

Due to the nature of the Builders' Cushion Joint it is possible to obtain a wide range of strength. However, after much research, the most efficient and practical joint was submitted to the Robert W. Hunt Company for test with the following results:

Report No. 39860

Dimensions under compression. .4 in. x 2¾ in.
Area under compression.....11.000 sq. in.
Original thickness .....0.242 in.
After test .....0.118 in.
Permanent set (after 600 lbs. per sq. in.) 0.124

Total Compression:

At 1100 lbs. or 100 lbs. per sq. in.....0.061 in.
At 3300 lbs. or 300 lbs. per sq. in.....0.103 in.
At 6600 lbs. or 600 lbs. per sq. in.....0.146 in.

The solid material used in the Builders' Cushion Joint consists of two pieces of lead with a total thickness not in excess of 0.068 in. Consequently, in the use of a joint 0.250 in. there is a total possible compressible area of 0.182 in., which is far in excess of the movement obtained from any other product used for this purpose. It is evident that the greatest protection results from the use of the Builders' Cushion Joint.

Specification Notes

The Builders' Cushion Joint, in order to obtain the greatest protection with the least amount of material, should be placed at some point in the piers between the window sill and the lintel above, i. e., at some level in the window opening. The joint should be used the full depth of the thinnest ashlar stone, in the weight-carrying piers. One course for each story height is the general practice for complete protection. In setting, plans will be furnished showing the location of each piece of material. Also, where more than one length of the Builders' Cushion Joint is required in a pier, a pliable mastic will be furnished to be used at the point where the two pieces of Joint meet. This will insure a waterproof job. The material should be set dry, and mortar to be used only when the bed on which the joint is to be placed is uneven. In the event it is desirable to conceal the joint, it may be recessed ¼ in. and pointed with some non-staining mastic pointing compound.

Specify Builders' Cushion Joint and be assured of complete protection. We will gladly assist in laying out the most economical locations for the Builders' Cushion Joint.

OUR FIFTY-FOURTH YEAR

THE BELDEN BRICK CO.

Manufacturers of "Belden Brick"

CANTON, OHIO

NEW YORK OFFICE: 15 East 26th Street

DETROIT OFFICE AND WAREHOUSE: 14305 Livernois Avenue

FACTORIES: CANTON, SOMERSET, UHRICHSVILLE and PORT WASHINGTON, OHIO

Distributors in All Principal Cities—Write Us for Name and Address

BELDEN VITRITEX OVERSIZE FACING UNITS

A non-glare, dirt resisting, easily cleaned product. Made in Creams, Golden Buffs, Grays and Iron Spots.

Belden Oversize Facing Units are available in the following face sizes: 5x8, 5x12 and 8x12 in.

We manufacture a full complement of shapes and fittings—for complete shape details ask us for our shape bulletins, or refer to catalog of the Glazed Brick and Tile Institute—for which see File Index.

For facing walls with oversize clay units, the need and the effect desired vary greatly as do the conditions the units will be called upon to meet. Since all "Belden" products are made with emphasis on "How will they look 25, 50 or 100 years from now" our over-size units, like Belden Standard Size Brick, are made with the following qualifications in mind:

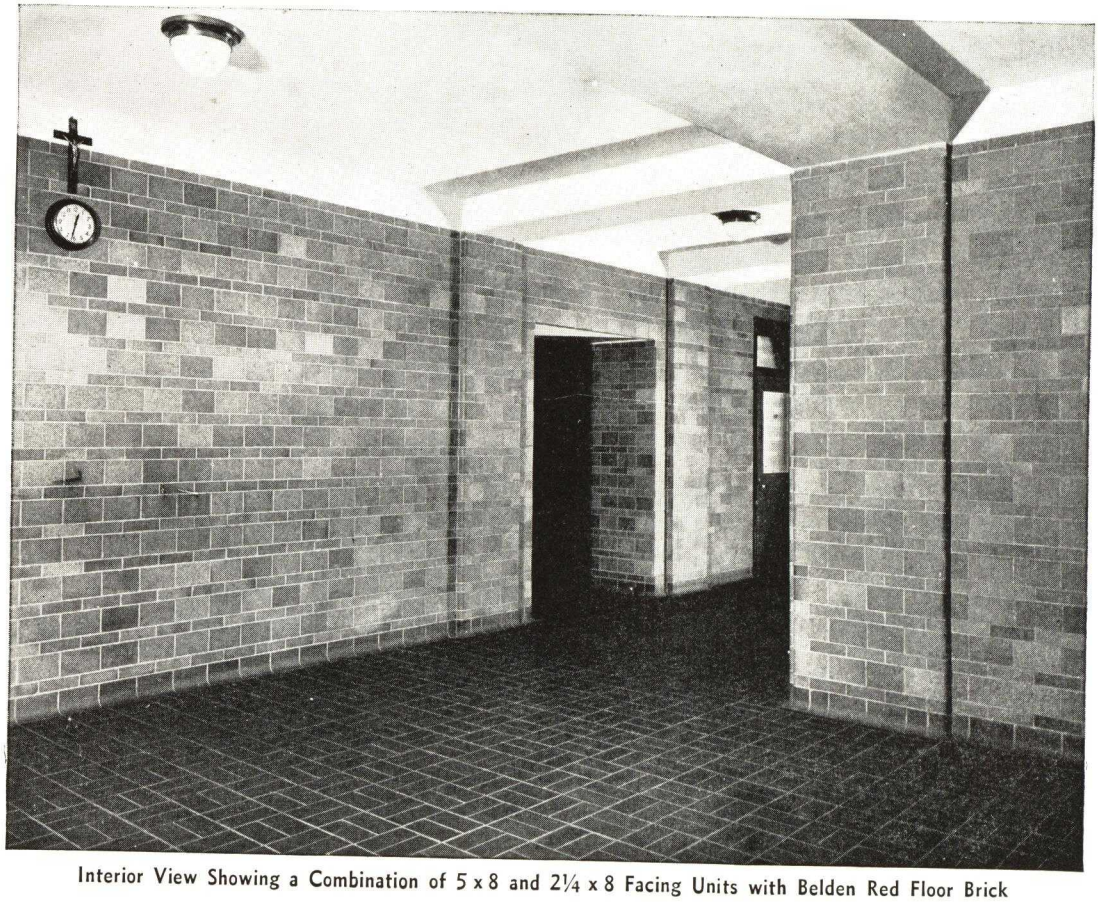
They must be very dense so they will retain their original color and age gracefully. To achieve this result the brick are made fully de-aired, thus starting with the densest and toughest clay body, and the ware is burned right up to complete vitrification; they must be strong enough to meet any structural requirements; they must stand indefinite exposure to any and all climatic conditions, and they must stand severe physical shock.

Climatic conditions, by which we mean moisture penetration, constant freezing and thawing, set up great stresses and strains within the clay body, and the clay body must be dense enough and of great enough cross section to withstand this terrific punishment indefinitely. Belden Vitritex Units are made for exterior as well as interior facing and therefore will meet the maximum demands in this respect.

The mortar joint has always been a very important feature of good brick masonry—its importance will be just as great a part of the masonry erected with Belden Vitritex Units. To walk into a room, be it church, auditorium, library or any other where the use of this product is appropriate, lined with our product, is to be immediately conscious that you are in the presence of a type of construction with which you are familiar and for which you have great respect because of its heritage of stability and beauty.

You know the color is there forever, for you see and sense that the color is part of the product and will endure.

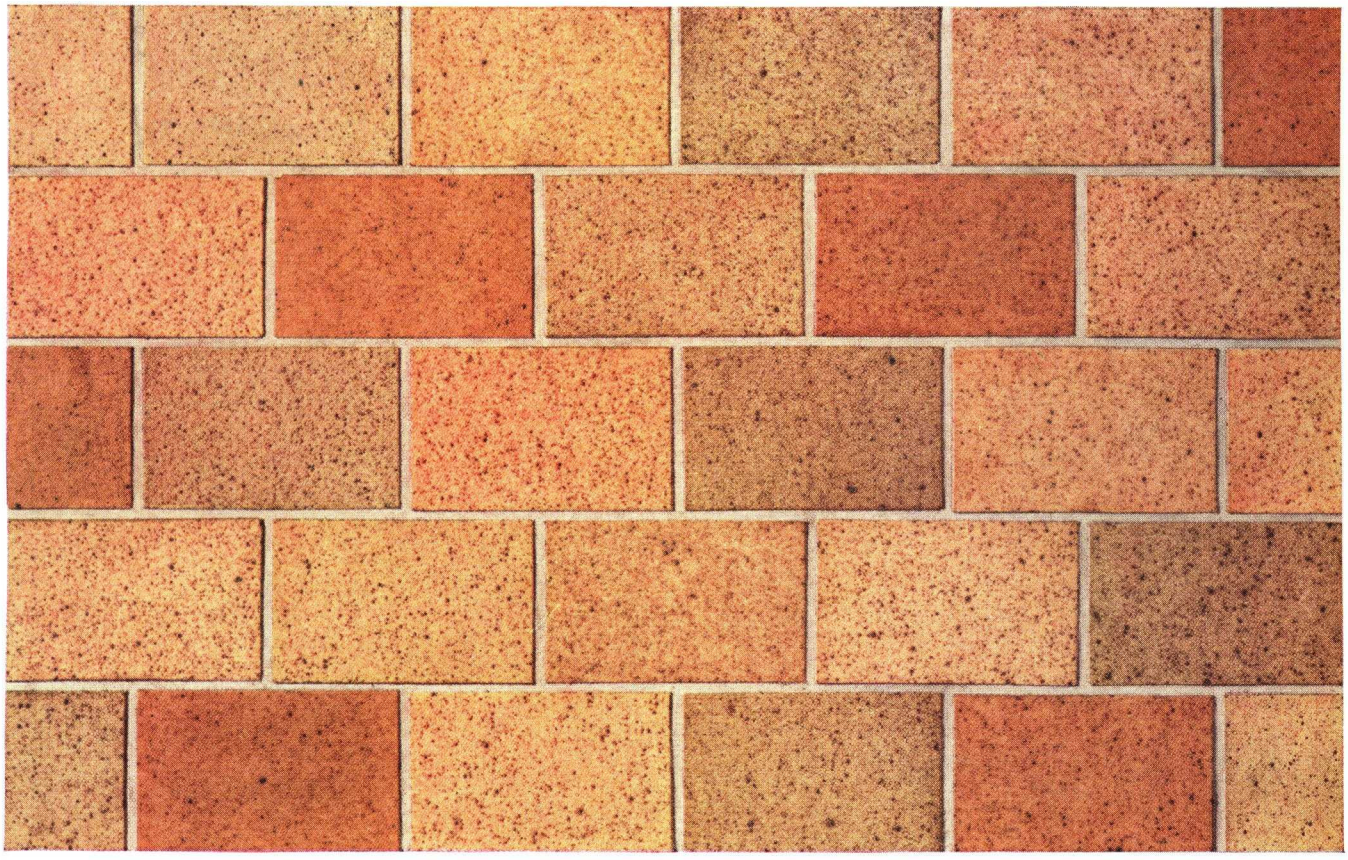
We are striving for and think we have a product that goes with oak and metal—strong, sturdy, enduring, and yet warm, colorful, friendly and charming.



Interior View Showing a Combination of 5 x 8 and 2¼ x 8 Facing Units with Belden Red Floor Brick

THE BELDEN BRICK COMPANY

BELDEN FACING TILE—in permanent, natural colors—makes plastering and painting unnecessary—the wall is always the same—always beautiful.



AZTEC BLEND IRON SPOT FACING UNITS (5 x 8 x 3¾″)

1280 SERIES GRAY MANGANESE FACING UNITS (5 x 8 x 3¾″)

These color ranges are also produced in standard size brick 8 x 2¼ x 3¾″, 5 x 12 x 3¾″ and 8 x 12 x 3¾″ units. We produce all shapes and fittings for these sizes.

Catalog showing other shades and textures sent upon request.

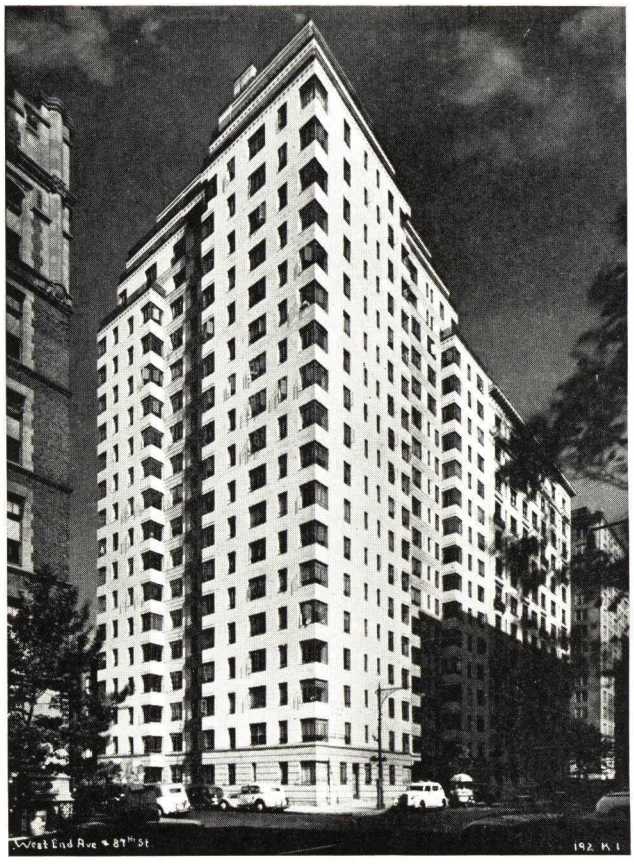
BELDEN FACE BRICK

To prevent substitution with consequent disappointment all "Belden Brick" are branded.

"BELDEN BRICK" registered U. S. Patent Office, are manufactured in five modern factories by an organization which has been successfully established for 54 years.

"BELDEN BRICK" are made from Ohio's finest plastic fire clays and shale in all colors—buffs, creams, grays, speckled grays, speckled buffs, browns, pinks, reds, blues, greens and multicolors. They are produced in all textures—smooth, matt, vertical scored, sand finished and distinctive textures developed by us.

Having served the architect and builder with "Belden Brick" since 1885, we know the importance of service. We never take an order for delivery sooner than we can fulfill it or for something we are not sure we can make. You can feel sure when you place an order for "Belden Brick" that your requirements are going to be taken care of. When you want samples, a panel or a representative, please write or wire; we will take care of you promptly.



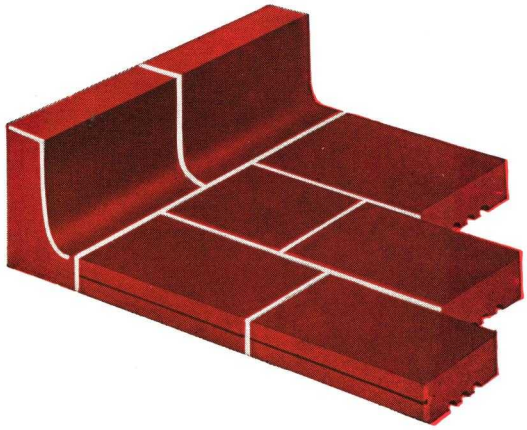
Apartment, Corner 87th St. and West End Avenue, New York, N. Y.
H. Feldman, Architect
Belden Facing Tile used up to second floor window sill, and Smooth Manganese Speckled Creams for the field. A combination of Facing Tile and Standard Brick showing the possibilities in design and trim by the use of Facing Tile and Standard Brick in contrasting colors.

"Match Jobs"

We often supply match jobs and duplicate products that were made by plants no longer operating, and we solicit such inquiries.

Industrial Buildings

Aggressive manufacturers are now using Face Brick for their industrial buildings. Attractive colors and light reflecting walls are paramount, and available at small additional cost.



FOR THE FINEST BRICK FLOORS

Belden De-Aired Floor Brick have proven satisfactory. Belden Floor Brick stand up under the very hardest punishment. The workmanship is the best, therefore suitable for schools, hospitals, public and commercial buildings of all kinds. They resist live steam, acid action, grease, milk fat, the pounding of steel truck wheels and other severe conditions.

Manufactured by an improved process, vitrified in kilns at a temperature of 2100°, they are hard, tough, and practically indifferent to what happens to them.

Their handsome dark red color will dress up your building surprisingly, and they can easily and quickly be installed over an old floor at a reasonable cost.

They are 8¼ x 4 x 1⅜″ in size, and are supplied with either smooth or matt surface.

LOCHER & CO., INC.

Makers of Colonial Virginia Handmade Bricks and Moulded Brick Doorways

MAIN OFFICE AND WORKS: Glasgow, Virginia. Telephone: Natural Bridge 223
OFFICE AND YARD: Richmond, Virginia, 3714 West Broad Street. Dial 4-4018

PRODUCTS, FACILITIES AND SERVICE

Moulded and Carved Brick Doorways

A most unusual and outstanding series of moulded, cut and carved Brick doorways has been designed for us by Perry, Shaw & Hepburn, architects for the restoration of Colonial Williamsburg, Virginia. We are now prepared to produce these designs in completely assembled custom built units. Also, when preferable, the architect expresses individuality with his own design and we suggest use of the proper Perry, Shaw & Hepburn profile mouldings, thus lending true Colonial Virginia authenticity without violation of design principal.

The heretofore exhorbitant cost entailed in reproducing these beautiful landmarks of a by-gone day to special single order, is obviated and last but by no means least, on time delivery to job site is assured.

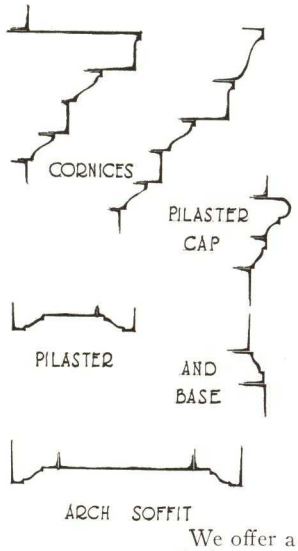
Locher Moulded and Carved Brick Doorway for the Gaynor Keeler Residence, Albany, N. Y.
OFFICE OF MARCUS T. REYNOLDS, Architect

Old Fashioned Handmade Bricks

Our handmade bricks are actually moulded by hand in wood moulds coated with sand. They are dried by being placed on the ground in the sun, or put through mechanical dryers as is most convenient. They are burned both in circular down draft kilns with coal; and in the old fashioned open top field kilns with wood.

Matching of Old Brickwork

Basic color tones in brick are governed by ferrous oxide content of the clay. We are equipped with clays running as low as 2% ferrous oxide, those burning a pure white color and as high as 5% ferrous oxide, those burning a deep toned oxblood. Different blends of these clays allow us to produce all the intermediate tones between white and black and therefore to color match, or duplicate any and all Colonial Brick masonry. Size and texture are of course minor problems.



Williamsburg Range

This range is produced from a blend of different clays to burn into colors peculiar to the low iron content clays of Tidewater, Virginia. Stock range is composed of approximately 80% varying shades of brown, blending into orange and pink; and 20% medium reds. There are no dark red or purple brick in this range. With this brick, we enjoy the exclusive privilege of offering a medium for faithful reproduction of the mellow and soft toned effects so outstandingly noticeable in the restoration buildings at Williamsburg, Virginia.

Kenmore Range

This range is produced from clays of higher iron content than used for our Williamsburg types, to burn into colors peculiar to the upland sections of Virginia. Stock range is a blend of medium to dark red with good per cent of brown ends and some brown flashings on the faces. The "in the wall" effect of this brick is deeper toned, richer and darker than the Williamsburg type. It reproduces the brickwork in historical Kenmore at Fredericksburg, Virginia, built by Colonel Fielding Lewis in 1752.

Chateau Range

This brick is produced from white burning clay to replace the usual whitewash or painted jobs. It is a custom made product produced to special order for shipment on three to four weeks notice. The unusual creases and folds showing in the faces of these brick and found only in genuine hand-moulded units lend charm and beauty to any design. The permanency of color and finish is available in no other material. Biennial costs of upkeep, with consequent damage to vines and shrubbery close to the house, as is always involved in painted brickwork, is entirely eliminated.

Westover Type—(Blend)

This is our standard size 8 x 2¼ x 3⅞ handmade brick. Stock color range is a blend of varying shades of red and brown with modest dark flashings and cross markings. Other ranges are produced in standard size to special order only.

Machine-Moulded Colonial Bricks

Our machine-moulded lines are produced from the same clays, moulded in the same sands and burned under the same conditions as our hand-moulded wares. The beauty of a handmade brick wall is due primarily to the fact that no two units are the same and in our machine-made ware we do everything possible to keep away from mechanical perfection or this sameness. This enables us to offer a beautiful colonial brick with true Virginia background for conservative colonial designs where cost is primary consideration. Available in both standard and oversized with special shapes.

Special Shapes to Architect's Specifications

Our special shapes department is completely organized to render the very highest type of efficient service. We prepare, without charge, full sized detail from architect's quarter scale drawings. After approval of our drawings approximately 5 weeks time is required for delivery of material to job site. The production cost of special ware, to a large degree is governed by the quantities involved and if elevation sheets are submitted to us we will, in most instances, figure a combination that will total considerably less than unit prices would indicate.

Services

We operate twelve months in the year with a total production of 50,000 to 60,000 bricks daily. We offer a consultation service to architects on the possible use of shape and trim treatment, specific cost data, etc. — without obligation.

Our representatives in various cities will be glad to show you display panels of our products. Permanent out-of-doors panels of our different types can be seen in display yard adjoining our Richmond Office at 3714 West Broad Street.

A list of representative projects where our products have been and are being used in various sections of the country will be gladly mailed you on request.

MEMORANDA

ARKETEX CERAMIC CORPORATION

SUCCESSOR TO

The Ar-ke-tex Corporation and The Clay Products Co., Inc. of Indiana

BRAZIL, INDIANA

REPRESENTATIVES IN ALL PRINCIPAL CITIES
Member Glazed Brick & Tile Institute

PRODUCTS

A structural clay product with a finely finished face, known as AR-KE-TEX Brick and Tile.

Also Velveduct, a vitrified glazed clay conduit for underground electrical transmission and Raggle Block.

AR-KE-TEX
ART-KERAMIC-TEXTURE

Trade Mark Reg.

SIZES

AR-KE-TEX products are made in 2¼x8, 5x8, 5x12, 10¼x12, 12x12 and 8x16-in. face sizes with a full complement of shapes and fittings to build any type of bearing or partition wall, exterior or interior, with a permanent, impervious, sanitary finish.

ARKETEX COLORS AND FINISHES

Ceramic Glaze—Light Colors

FLAT COLORS:

G90—Cream Gloss
S100—Cream Satin
D110—Cream Matt
D114—Light Tan Matt
G170—Ivory Gloss
D180—Ivory Matt
G420—White Gloss
S281—Light Gray Satin
D650—Gray Matt

STIPPLED AND MOTTLED COLORS:

T110—Cream Buff Stipple
ST110—Glossy Cream Buff Stipple
M122—Cream Brown Mottle
T410—Cream White Mottle
ST420—Glossy White Mottle

Ceramic Glaze—Trim Colors

FLAT COLORS:

D304—Light Green Matt
S309—Dark Green Satin
D358—Light Blue Matt
D448—Dark Blue Matt
G468—Dark Blue Gloss
G668—Red Brown Gloss
G678—Dark Brown Gloss
S688—Chocolate Brown Satin
G700—Black Gloss
S701—Black Matt

MOTTLED COLORS:

T213—Blue Green Mottle
T219—Green Mottle
M335—Blue Mottle

Ceramic Transparent Glaze

G114—Insul Glaz

Special colors are available by special arrangement.

CONSTRUCTION FEATURES

AR-KE-TEX products combine many exclusive features of quality and construction:

Thorough vitrification of glaze and body.
Imperviousness of face.
Fire, acid, oil and grease resistant.
Insulating qualities.
Sanitary finish.
High bearing strength.
Low dead weight.
Indestructability and attractiveness of finish
Wide choice of colors and textures.
Economy and rapidity of erection.
Permanence of color and glaze.
Readily cleaned with low maintenance cost.
Low relative cost.
Permanent beauty.

EXTERIOR USE

Due to the hard impervious body and glaze AR-KE-TEX products are recommended for exterior as well as interior wall areas. The finish will not craze, crack or peel and will not change color in the wall after erection.

FACILITIES AND SERVICE

AR-KE-TEX products are made in three plants with a total of 72 kiln capable of producing more than 8000 carloads per year. All plants are located on trunk line railroads.

Ample stocks of standard units are maintained for prompt shipment.

The Company maintains at Brazil an Engineering Department ready at all times to assist the architect, engineer or contractor with quantity surveys, typical coursing layouts, or the solution of any construction problem, where AR-KE-TEX products may be involved.

Special sizes and shapes can be manufactured to meet unusual conditions.

NEW DEVELOPMENTS

The AR-KE-TEX line is being constantly improved and increased with new colors and textures and new units.

Consult with our nearest representative regarding latest developments.

MORTAR AND MORTAR COLORS

AR-KE-TEX products may be laid in any kind of mortar made according to good practice with joint size and color to suit the individual taste of the designer or his client.

CUTTING TILE

The installation of a portable electric saw with an abrasive disc for cutting AR-KE-TEX when necessary, is recommended on every project of any size. Our representative in every locality will gladly furnish any contractor with data on saws which have been found satisfactory. The use of these power saws has saved time and money for contractors on many recent projects, besides assuring excellent tile installations because of the precision with which mortises, mitres and odd lengths may be cut.

SAMPLES

Full size or miniature samples of any standard texture of AR-KE-TEX products will be sent without charge to architects on request.

INSTITUTE STANDARDS

AR-KE-TEX products conform to Glazed Brick & Tile Institute standards for sizes, shapes, and grading rules and are second to none for excellence of results in all tests prescribed.

CONTINENTAL CLAY PRODUCTS COMPANY

MANUFACTURERS OF

Continental Glazed Brick and Tile
McNees-Kittanning Buff and Gray Face Brick
Unglazed Facing Tile

MAIN OFFICE AND FACTORY

KITTANNING, PA.

REPRESENTATIVES IN ALL PRINCIPAL CITIES

CONTINENTAL GLAZED BRICK AND TILE

Sizes and Colors

CONTINENTAL GLAZED BRICK and TILE are manufactured in standard size glazed brick, 5x8-in. or two-brick size and 5x12-in. or three-brick size glazed tile. They are made in all colors and finishes which can be produced in high fired ceramic tile of this type.

Quality

The same high grade plastic fire clay is used in the manufacture of the body of CONTINENTAL GLAZED BRICK and TILE as we have used in our regular buff and gray face brick for many years. Our method of manufacture insures perfect bond between the body of our tile and the glaze. Because we manufacture by the one-burn process, both the body of the ware and the glaze are subject to a very high temperature in the burning. Both the body and the glaze will withstand oils and acids and are not affected by the methylene blue or liquid ink test.

Quantity

We have furnished glazed brick and tile for many outstanding buildings in different parts of the country. Our plant is always in operation.

Shapes

We are equipped to manufacture all standard fittings and shapes and can also make on order any specials that may be required.

McNEES-KITTANNING BUFF AND GRAY FACE BRICK

Quality

MCNEES-KITTANNING BUFF and GRAY FACE BRICK have been the standard of quality for thirty years. They are made from the highest grade plastic fire clay. We have a large acreage of this clay which has a very uniform quality—there has not been any noticeable variation during our thirty years of manufacturing experience. This assures uniform size and color and enables us to duplicate at any time any shade of brick we have ever made.

We have supplied brick for outstanding buildings all over the country. We believe we enjoy a wider shipping range than the manufacturers of any other brick, as this particular type of light brick is manufactured only at Kittanning.

Permanent Colors

MCNEES-KITTANNING BUFF and GRAY FACE BRICK are burned at high temperature entirely by natural gas to the lightest clear shades of buff and gray. This makes their color permanent and accounts for their not soiling after being in the walls and exposed to the weather for many years.

Near White Gray—We believe our gray brick are the lightest in color, or nearest white of any brick manufactured.

Buff—Our buff brick are made in several different tones of light clear buff and graded to uniform shades. This enables us to supply large orders of an absolutely uniform shade or, if a mingle is desired, we can mix the different shades, the color tones blending perfectly.

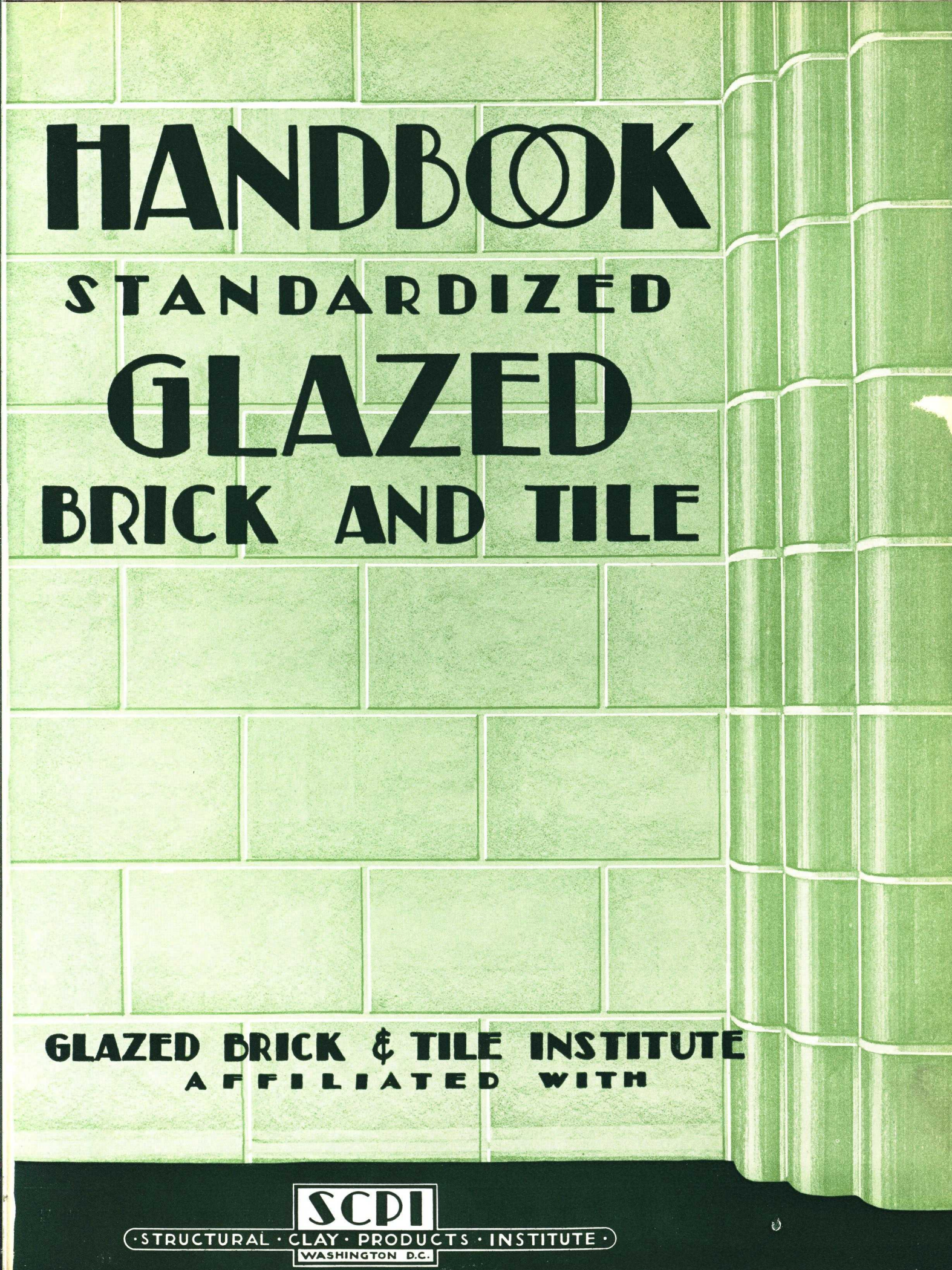
UNGLAZED FACING TILE

These are made in light buff shade in the same size units as our glazed tile and require the same line of shapes or fittings. They are load-bearing and can be used as part of the wall instead of just a lining. As they can be laid more quickly per square foot and are lighter in weight, the cost in the wall is considerably less than for standard size brick.

The type of coring used in both our glazed and unglazed tile enables the mason to make cuts on the job more readily than with other tile. This eliminates the shipping of different sized pieces and the trouble of keeping them separate on the job.

We are equipped to manufacture any of our products by the de-aired process.

We are members of the Glazed Brick and Tile Institute and for information regarding shapes and other details, kindly see Institute Catalog (refer to File Index) or write us direct.



HANDBOOK

STANDARDIZED

GLAZED

BRICK AND TILE

GLAZED BRICK & TILE INSTITUTE
AFFILIATED WITH
SCPI
·STRUCTURAL · CLAY · PRODUCTS · INSTITUTE·
WASHINGTON D.C.

FOR WALLS OF BEAUTY, PERMANENCE AND SANITATION

Use Products of Members of

THE GLAZED BRICK AND TILE INSTITUTE

1427 Eye Street, N.W.

WASHINGTON, D. C.

PRODUCTS OF MEMBERS

The products of the members of the Glazed Brick and Tile Institute comprise all of the varied shapes and sizes, including necessary supplementary and special shapes, in a variety of colors and finishes in the different glazes.
Specifically these are:

Ceramic Glazes	—Matt, Satin and High Gloss Finishes
Colors	—Solid, Stippled, Mottled and Speckled Effects
Salt Glazes	—Glossy Finish in Gray, Cream or Buff Blends
Clay Coated	—Variety of Colors

Years of experience have proved that fire clay is the best body for glazing. Accordingly the rigid specifications of the Glazed Brick and Tile Institute are based on the superior quality obtained only with a fire clay body, and in order to obtain the grade of ware meeting the Institute's specifications, the architect should always include the phrase "glazed on a fire clay body."

RESPONSIBILITY OF MEMBERS

Projects involving glazed ware installations require experienced service—and hence the architect should specify the product of an Institute member to be assured of the proper service on the job.

All Institute members must be fully capable of serving jobs of any size with the required quality in accordance with the Institute's specifications—the capacity to properly serve the industry is a primary requisite for Institute membership. Each member manufacturer is an established producer, with years of experience in every type of job involving glazed ware.

SIZES AND QUALITY STANDARDIZED

The shapes of the glazed ware industry have been standardized and coordinated, greatly reducing the number without restricting design, through the Institute's organized standardization effort. This simplification, as shown in the later pages of this catalog, is of invaluable aid to the architect in design, and is of equal importance to the contractor.

PERMANENT COLORS IN WIDE RANGE

Ceramic glazes are obtainable in solid colors covering the full range from white to jet black, and also in mottled, stippled and speckled effects. Salt glazes are obtainable in cream buff or gray blends. The colors of either glaze will not fade nor deteriorate, and can easily be cleansed by washing with soap and water.

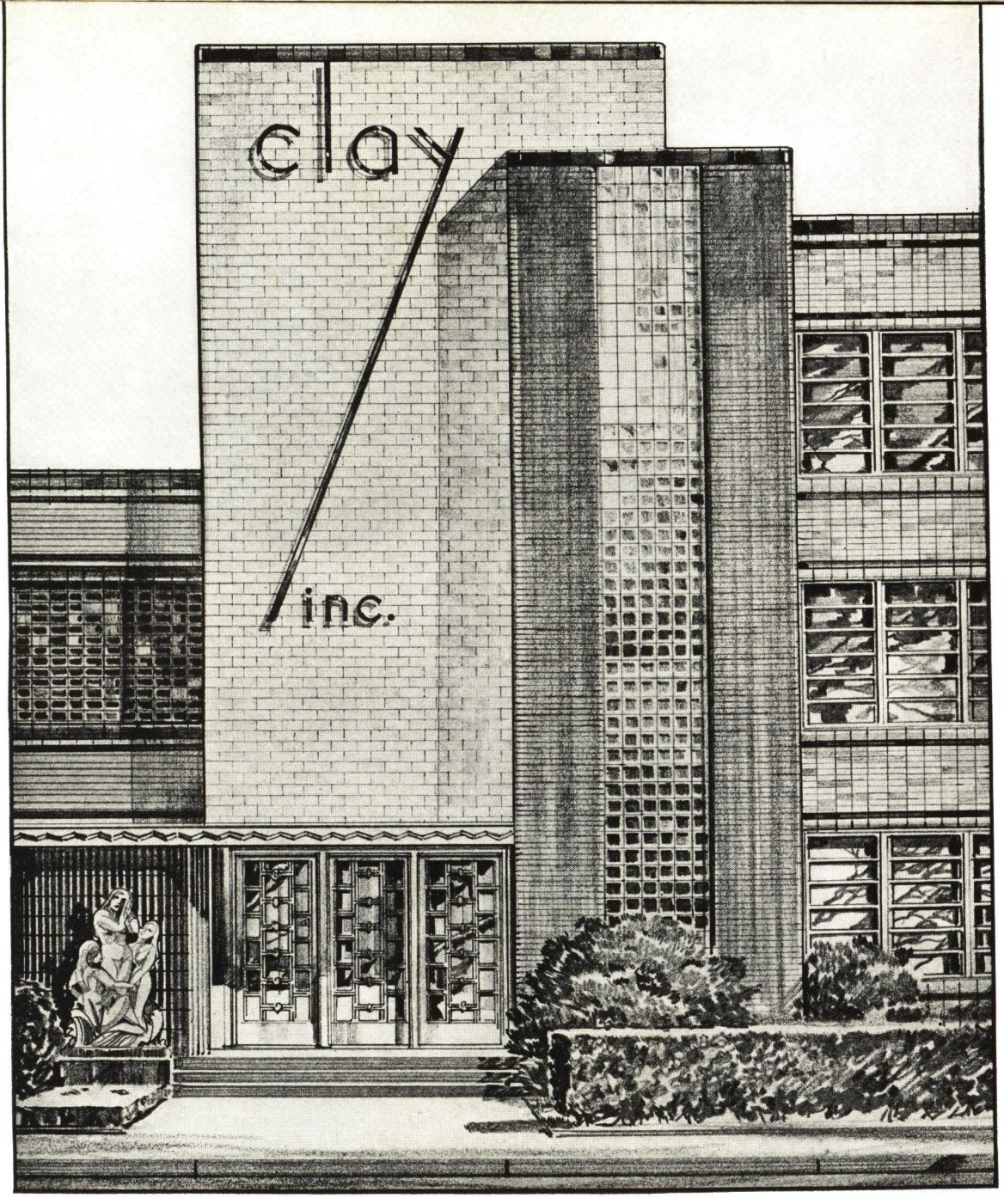
GUARANTEE OF THE GLAZED BRICK AND TILE INSTITUTE MEMBERS

Each member of the Glazed Brick and Tile Institute guarantees that any ware manufactured by him will conform to the quality standards, tolerances and grading rules as published herein. If it can be established within reasonable time, but in no event longer than one year, that any material does not conform to these standards, the manufacturer will replace defective units. The measure of damage after ware has been installed will be the replacement of defective units without charge at the factory, and no charge for labor or other expenses required to repair defective ware or damage occasioned by it will be allowed.

In no event will replacement of B or C Grades be made after installation. No replacement will be made of ware chipped on job or after installation, nor when used in service for which not recommended.

PROTECTION DURING SHIPMENT

All A-Grade Ceramic Glazed, Salt Glazed and Clay Coated units are shipped in cartons or trays. The architect should insist on this protection.



CERAMIC GLAZED BRICK
For Exterior Use

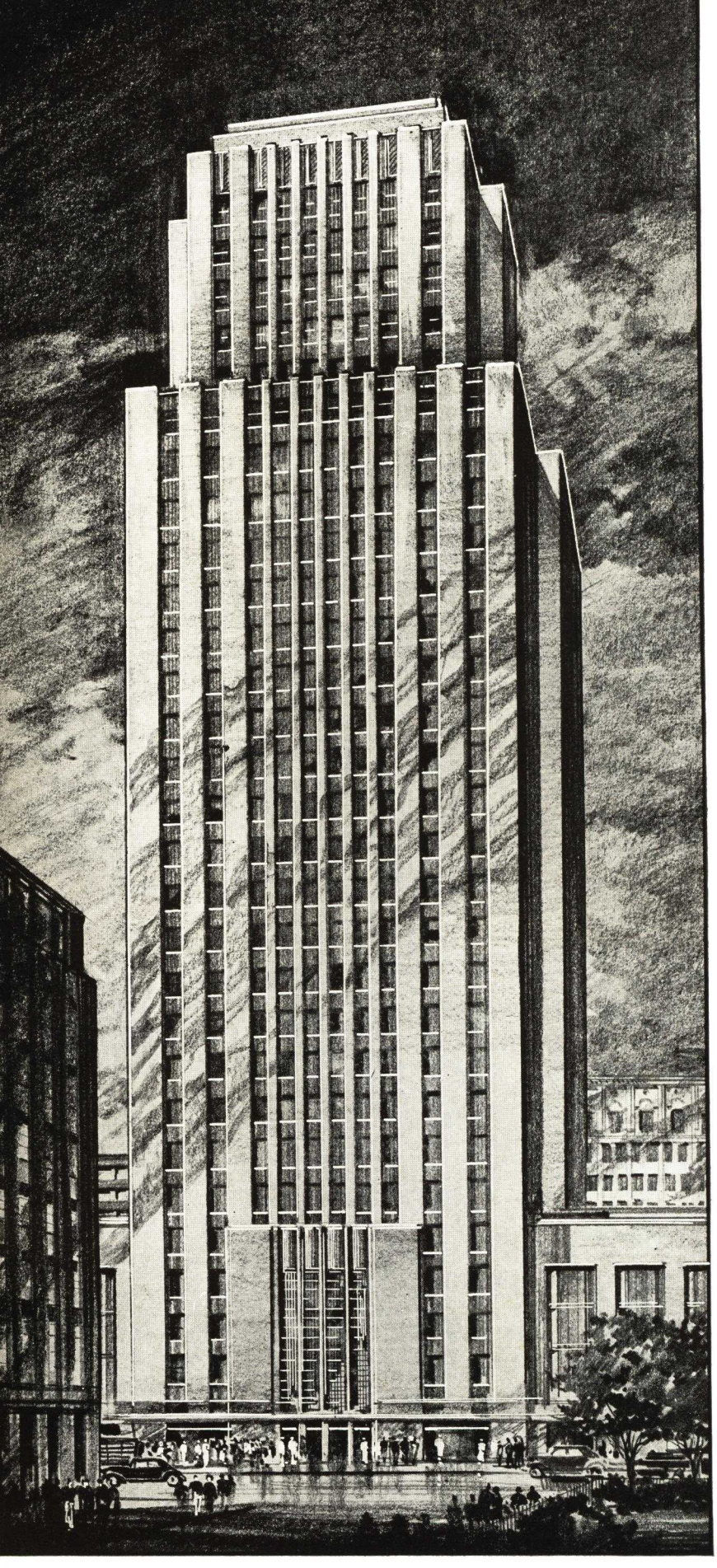
Ceramic glazed brick offers the ultimate in variety, charm and permanence for exterior use. Its superior beauty makes it particularly adaptable to the modern trend in architectural design, and its great variety of finishes and colors offers unlimited flexibility in design, either alone or in combinations with other materials.

Exterior finishes are available in Matt (a non-reflecting surface); Satin, having a sheen-like finish but not shiny even in large masses; and Glossy or Lustrous finish, which is bright, shiny and reflects images.

The Matt finish is generally used in conjunction with stone or other non-reflecting materials in order to preserve an even tone in appearance during years of weathering. This finish is vitreous and is satisfactorily and easily cleaned with soap and water.

Satin finish is used where a surface shinier than the Matt finish, but not definitely image reflecting is desired. It also can easily be washed with soap and water.

Glossy or Lustrous finish is generally preferred for buildings located near dirty industrial centers, due particularly to its non-adherence qualities.



MODERN SKYSCRAPERS Enhanced in Beauty by Ceramic Glazed Units

The pretentious ultimate of architectural design offered in the modern metropolitan skyscraper has been greatly augmented through the use of structural glazed products. It is structures such as these that offer the wide and unrestricted use of glazed units and permit the architect complete application of his artistry and love of beauty with no restrictions imposed because of the non-availability of shapes, colors or finishes in the glazed units he desires to utilize. Glazed brick and tile are available in a great variety of sizes, finishes and colors for use in every conceivable unit that makes up the modern building of today, be it a small "taxpayer" or a large monumental building.

Structural glazed units, either loadbearing or for partitions or veneering, offer unlimited adaptability for interior walls, partitions, wainscoting, or for exterior facing where a permanent, sanitary and decorative wall surface is desired at a minimum cost.

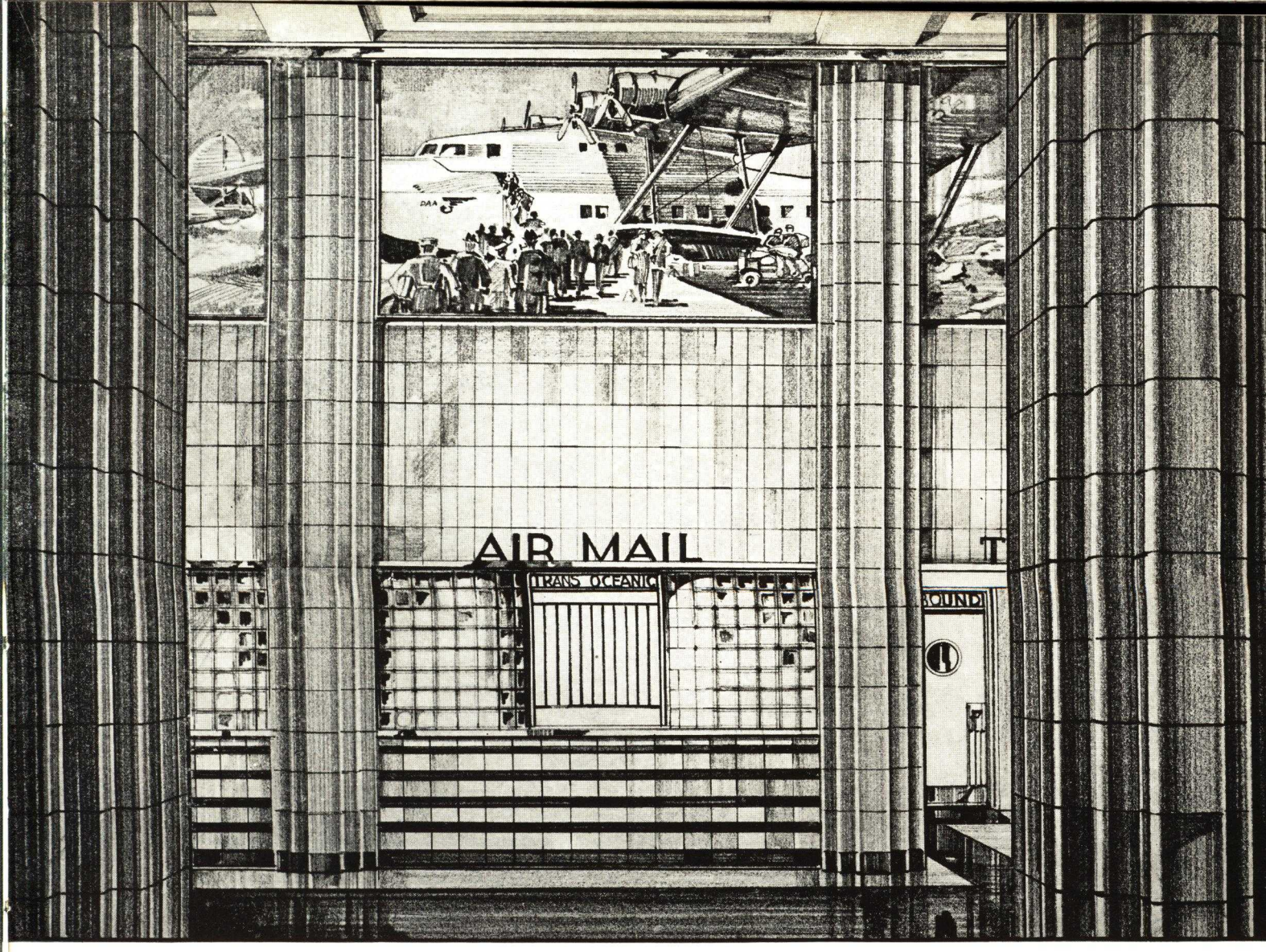
The variety of sizes, ranging from the one brick size (2¼x8) to the 8x16 face size, offers unlimited mosaic possibilities. Glazed units are especially adapted to the modern trend of smooth, unbroken surfaces, and are available in colors that harmoniously blend with limestone, granite, or marble for exterior structures of classical design or with any type of interior trim.

Structural glazed units are designed to interchange or bond with brick sizes. An exterior wall is commonly specified as 4″ of brick exterior backed up with 8″ of brick or structural clay tile. As the wall is constructed, the structural glazed units are bonded into the back-up material, resulting in a wall completely built of integral units with an exterior facing of brick and a glazed interior finish. Thus the extra cost and loss of space evolving from the application of a glazed surface veneer on the inside is eliminated. This is an economy feature of glazed brick and tile, and when it is further considered that the first cost of glazed brick and tile is the last, since it requires no maintenance cost during the life of the building, its true economy as a building and decorative material becomes evident.

There is no permanent equal to light colored glazed brick and tile in places where light reflection is desirable or necessary, such as light courts, basements, laboratories, etc. On dark rainy days, white glazed brick or tile reflect 80 per cent light as compared with 35 per cent for wet sand lime brick and 40 per cent for white painted or plastered wall (after two years).

The art of glazing has reached its present refinements through evolutionary developments from crude beginnings dating back to the days of ancient Assyria. Years of experience are necessary to produce a fine glazed product, and rigid as they are, the Institute specifications are meant to define only the minimum in quality to be received by the user.

All members' samples carry an Institute label—certifying the quality and limiting the size tolerances. Demand these for your protection.



CERAMIC GLAZED BRICK AND TILE

For Interiors of Beauty and Permanence

Ceramic glazed brick or tile, because of the large variety of sizes and colors, and the complete line of shapes available, lends itself to every conceivable use in building construction.

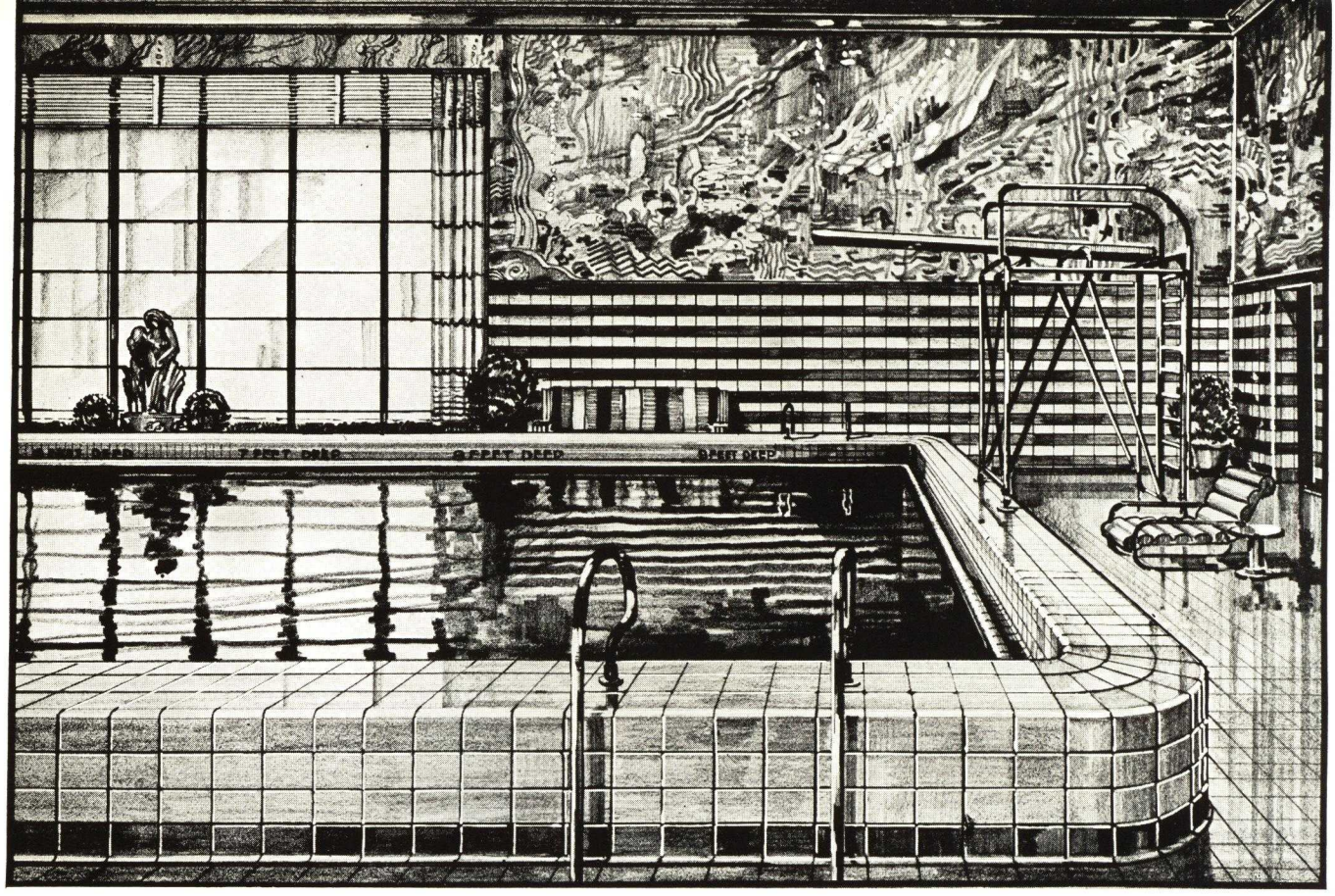
The available colors, in plain or mottled glazed effects, which are now produced, afford the designer unlimited possibilities in interior treatments and color schemes.

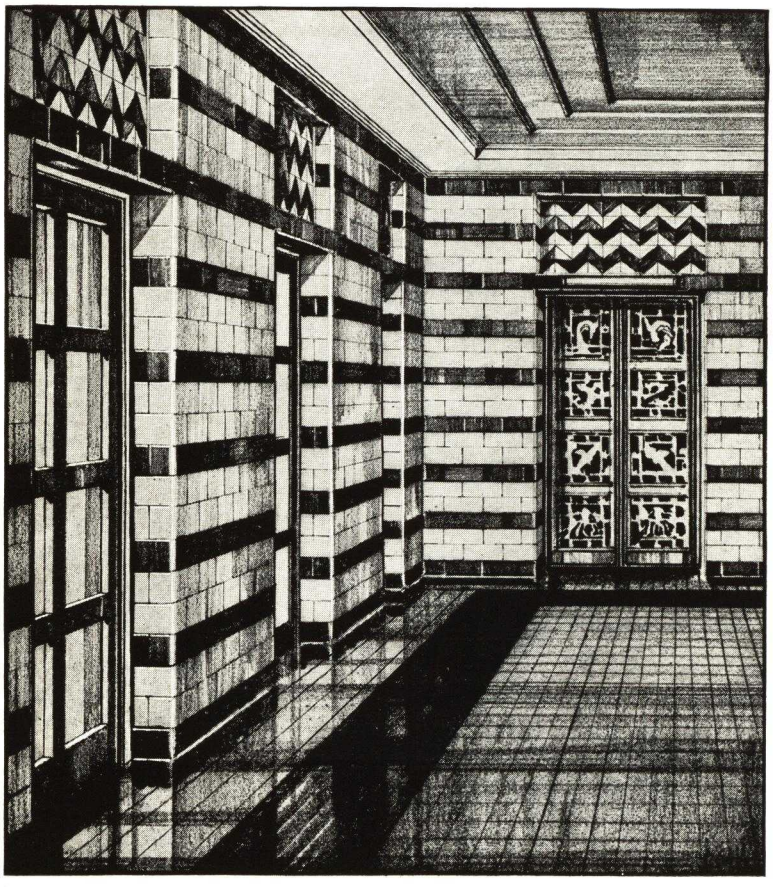
The complete elimination of any upkeep and the minimum cost of cleansing are further important features, since the colors of glazed units are permanent, and only periodical dusting or washing with plain soap and water are needed to restore the walls to their fresh and original pleasing brightness.

Because of these inherent qualities, glazed units are being extensively used in post office construction throughout the country.

No other material can so completely permeate an interior with a warmth in color, with an atmosphere of beauty and restfulness, or with a feeling of stability and permanence as can structural glazed units.

Structural glazed units do not limit possibilities, but permit the designer to project his full conception into actuality with all its colors, finishes and proportions.





SWIMMING POOLS OF BEAUTY ENTRANCES OF ELEGANCE

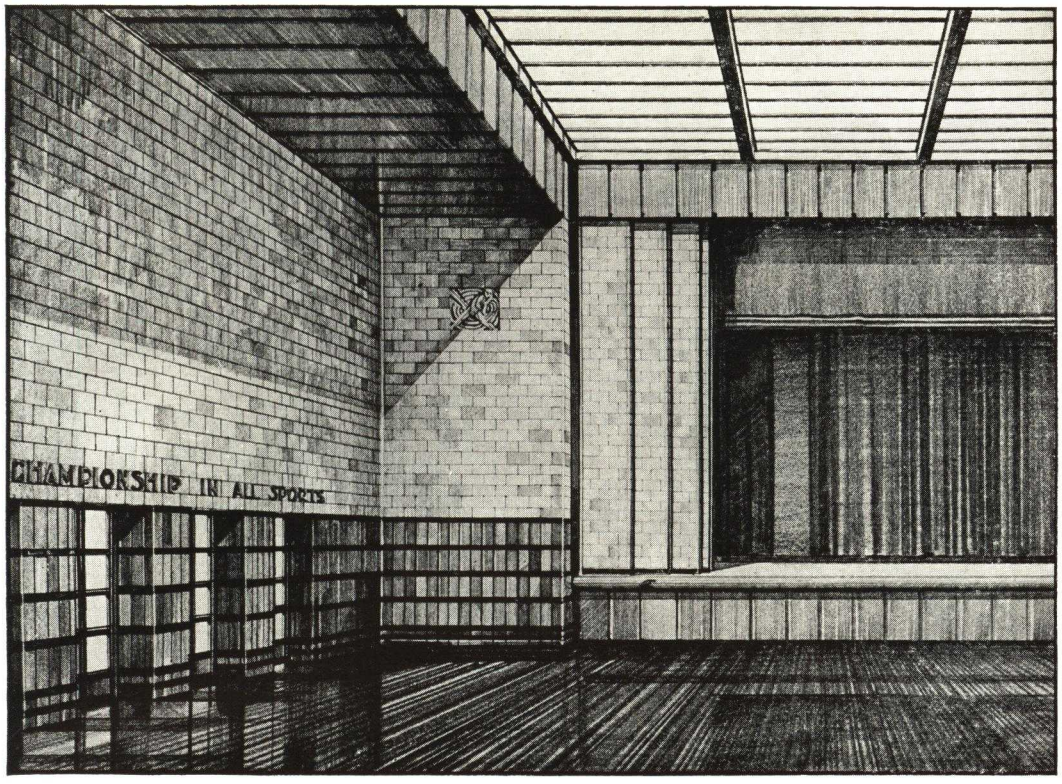
Ceramic Glazed Brick and Tile Maintain Their Refinement

The construction of swimming pools, natatoriums and entrances thereto in clubs, hotels or public buildings, is entirely in keeping with the modern trend of architectural design. All have been elevated from the prosaic place of mere utility to one of elegance and refinement. They must not only serve more efficiently and economically today than in the past, but progress demands they be creations of beauty.

It matters little if a pool is to be built in the cultural atmosphere of a club or private estate, or established for public use on municipal property — sanitation, maintenance and ease in cleaning must be given full consideration.

Structural glazed units are versatile and easily assume their place under any requirements. Their inherent qualities of beauty and finish make them especially adaptable for pool construction, because in addition to their full range of color, their glossy finish minimizes the number of cleaning out periods as well as the danger of bacteria adhesion.

Here again the designer can give full sway to his ideas of beauty, knowing that in addition, glazed units offer the full measure of sanitation and economy demanded by progress.



Here are excellent examples of modern construction of school auditoriums, gymnasiums or corridors of structural glazed units, the material that is impervious to the hard usage of juvenile contact.

SCHOOL AUDITORIUMS AND CORRIDORS

Demand an Abuse-proof Material

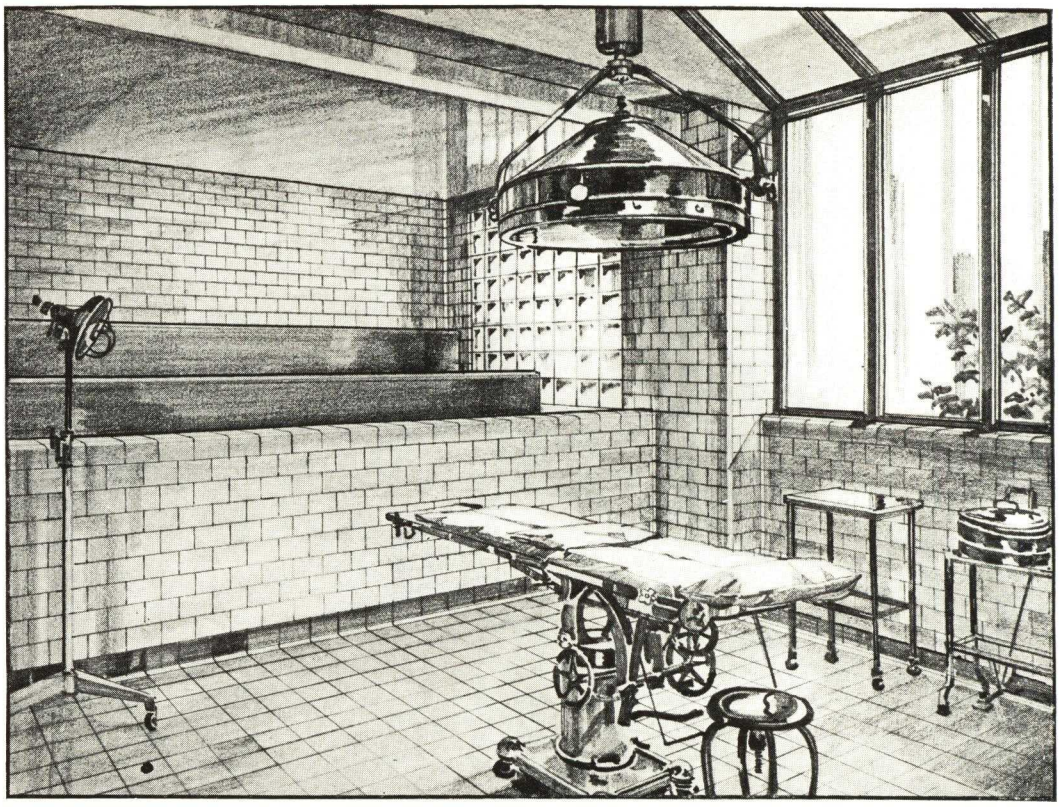
School auditoriums and corridors are subjected to constant abuse, and the use of any material unable to resist the treatment imposed upon it by juvenile contact means costly repairs and constant upkeep.

Ceramic glazed units offer the necessary resistance. Its nonabsorbent finish is impervious alike to chalk, pencil or pen markings. Likewise, its smooth finish presents an element of safety from abrasions through bodily contact.

These are but added features, for here as in any phase of construction, ceramic glazed units give the ultimate in interior finish, in color, size, or proportions. The full complement of shape units permit the carrying out of modern corridor construction, with lockers built into the wall, and corners all rounded—another safety feature.

School interior construction also demands good light reflection. There is no permanent equal to the light reflecting properties of light colored glazed units — this being another of the outstanding qualities which make glazed units the ideal material for school construction.

The acme of sanitation and cleanliness — walls that are impervious, smooth, shiny, easily cleaned and offer no lodging place for dirt or bacteria, are most easily and economically obtained by using structural glazed brick or tile.



WHERE CLEANLINESS IS PARAMOUNT

There is no Substitute for Structural Glazed Units

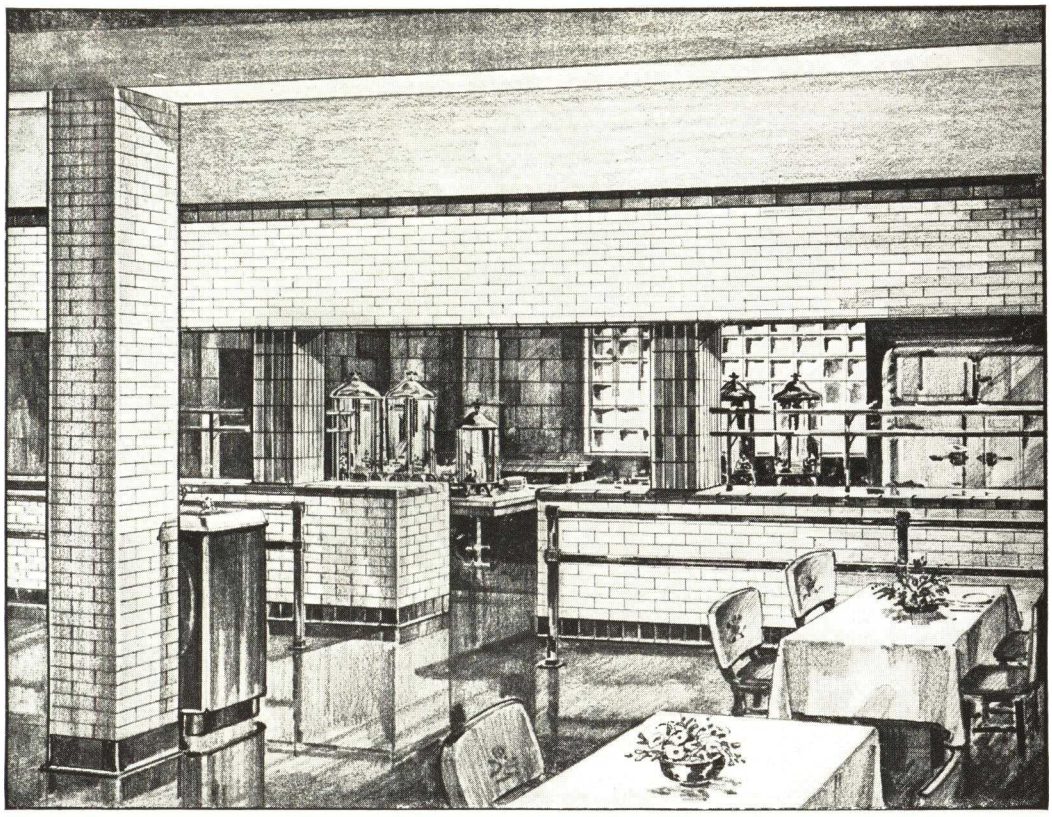
It is safe to say that there is no room where sanitation and absolute cleanliness are more paramount than in a hospital operating room. Here, where life and death often hang in balance, every precaution must be taken to maintain a state of perfect sanitation, and there is no substitute for the best.

The hospital diet kitchen must likewise be kept in a state of ultra-cleanliness, and for this reason the walls must be constructed of material that is germ proof and easily cleaned.

Since structural glazed units, either brick or tile, combine all of the qualities necessary to more than fulfill the desired requirements, their use is being constantly increased in the interiors of such rooms as illustrated, or in any rooms where walls of lasting charm at a minimum cost of upkeep are desired.

The ultra-smooth, impervious, permanent finishes of glazed units are ideal where sanitation is so necessary as in the two installations illustrated. Cleaning is reduced to a minimum, as is the danger of bacteria adhesion, and hence absolute cleanliness is easily obtained and maintained. Light reflection is likewise necessary, and here again the light reflecting surface of glazed units adds to the efficiency of both rooms.

Since in such important installations there is no substitute for the best—there is no substitute for glazed ware.



Where the walls are subjected to hard usage, and where permanence and sanitation are essential requirements—the only economical answer is structural glazed units.

CAFETERIA OR CELL BLOCK

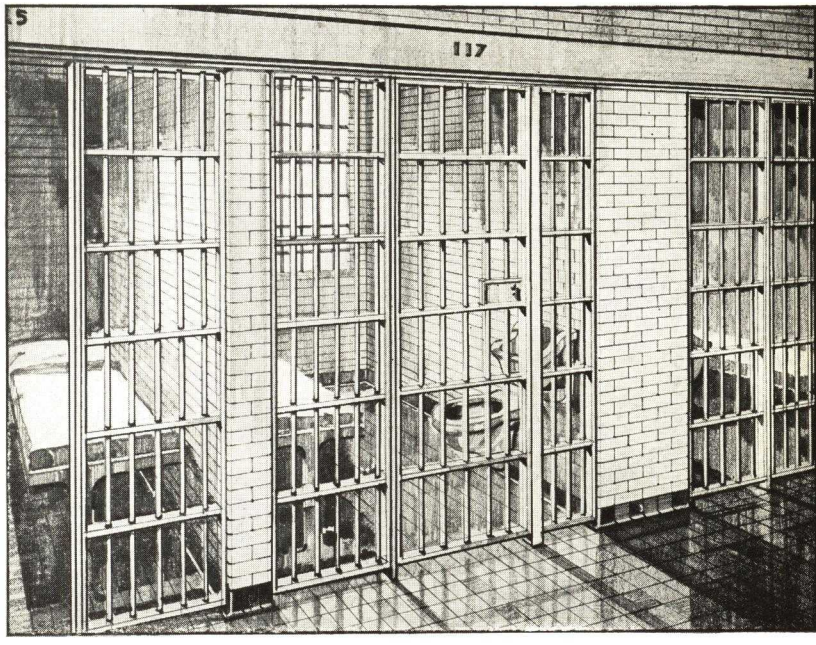
Structural Glazed Units Repel the Abuse of Constant Contact

There is little to compare in the relative functions of a cafeteria and a cell block with regards the purpose they serve, other than that their respective interior finishes are subjected to constant abuse, a point that merits consideration when specifications for their construction are written.

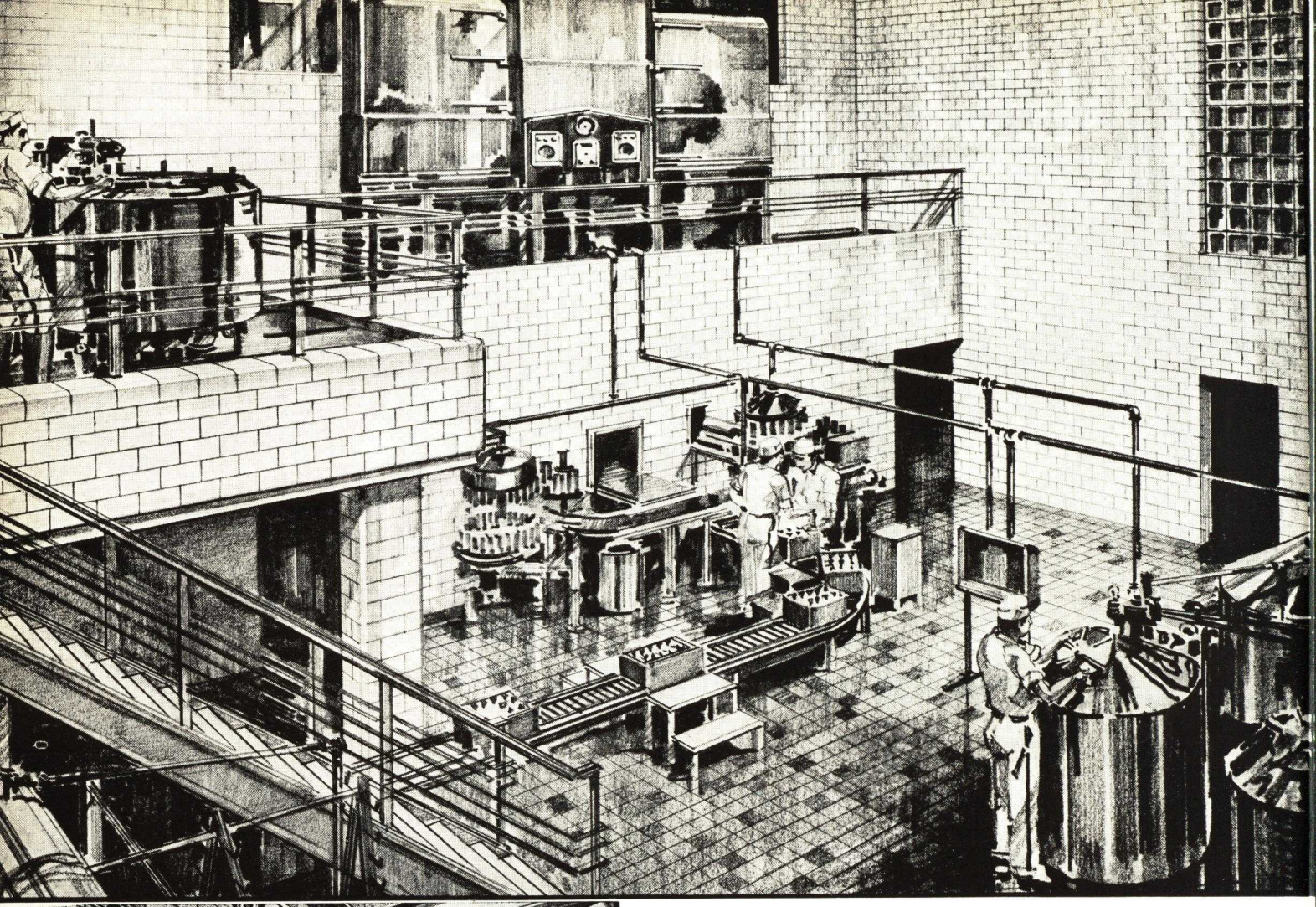
Likewise, the need for sanitation in both instances is evident, and here again structural glazed units show their versatility by answering the same purpose in two widely divergent types of construction.

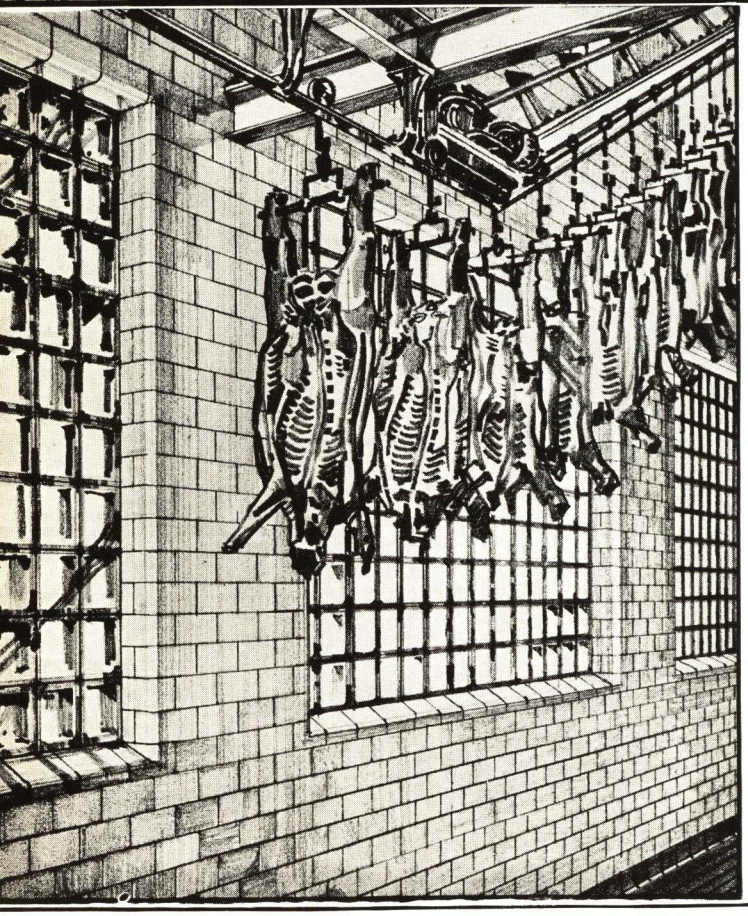
It makes little difference then if the project being planned is to be utilized in serving food to the public or in housing law breaking vagrants, for in either instance, or in other instances as widely separated in utilitarian purpose, structural glazed units are the logical wall material.

There is no structure today, nor is there an interior or any portion of an interior, that does not economically demand beauty, permanency, proportion, ease in cleaning, sanitation and imperviousness to carelessness or wanton abuse.



Structural glazed units, with colors permanently burned into an impervious finish, offered in various proportionate sizes and with full complement of shapes, answers every requirement and hence is the logical wall material to use in any type of construction regardless of purpose.





MILK AND MEAT
Demand Protection

Milk and meat, two of the foremost of life's necessities need the most careful and sanitary handling. Yet the progress of modern machinery is not sufficient if not properly housed in buildings with clean, sanitary light reflecting walls.

The use of glazed units in structures used for these purposes is almost essential since the most sanitary results for interiors are obtained with an impervious finish.

Years of experience in the utilization of structural glazed units in meat packing plants has prompted the Meat Packing Industry to state that "the use of glazed brick or tile for packing plant interiors has become universally adopted. Glazed ware is recognized as a good investment from a sanitary and maintenance standpoint, besides giving an attractive appearance to the premises."

The constant increase in the use of glazed units in dairies is another indication of how this wide spread industry also is reaping rich dividends in its good investment from a sanitary and maintenance standpoint.

BEAUTY AND POWER COMBINED

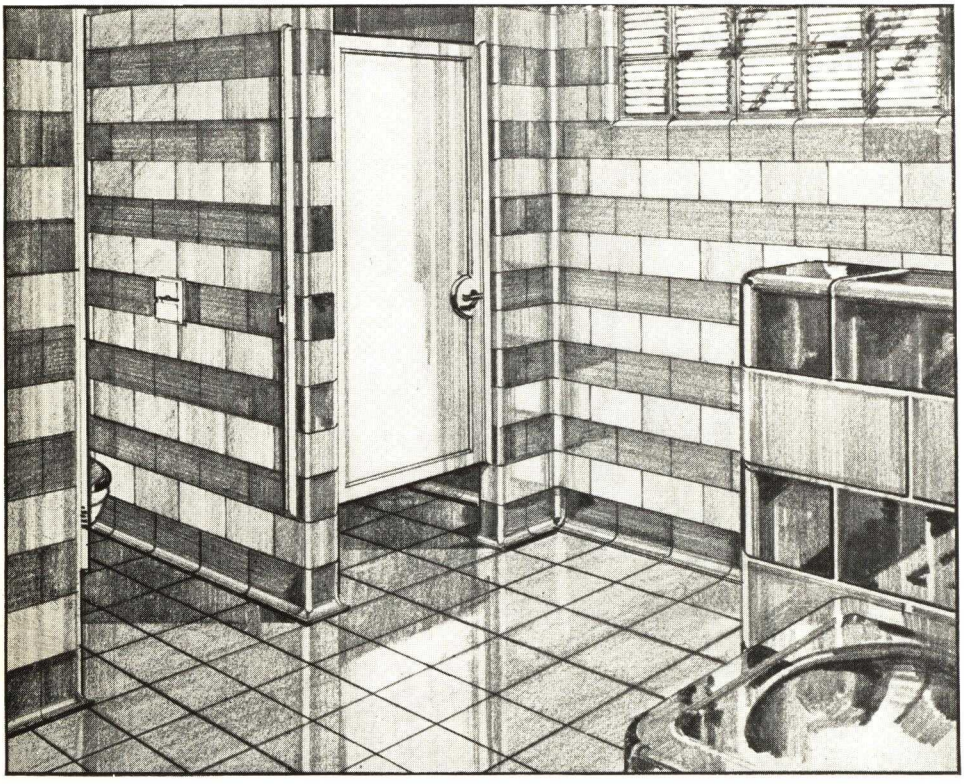
Structural Glazed Units Give Proper Machinery Protection

Power houses are no longer the disreputable looking structures of the past. They have been elevated, and rightfully so, to a plane in keeping with the essential commodity they produce—for power is the heart beat of a nation. The producers of power need proper protection and, in addition, power has combined with beauty.

Since structural glazed units combine these essentials, sturdiness, protection and beauty, their use in power house construction has been constantly on the increase.

Used as an integral part of the bearing or exterior walls, structural glazed units can never become dislodged due to vibration or settling of the walls. Further, there is no maintenance cost with this type of bearing construction tile such as is oftentimes experienced with various other materials which require periodic replacements or reconditioning.

The general qualities of structural glazed units likewise make it the ideal material for stair wells.



STRUCTURAL GLAZED UNITS FOR FILLING STATIONS

Furnish an Atmosphere of Business Stability

Owners of filling stations appreciate the advertising value of the permanent and artistic appearance of a filling station of structural glazed units. The permanent structure of glazed units reflects the responsibility of the owner.

Structural glazed units are impervious to oil and grease stains, and hence the station maintains its beauty and newness indefinitely.

Public toilets likewise demand the use of structural glazed units, since the glossy finish facilitates frequent cleaning made necessary by intense usage. Hence they are very easily kept clean, bright and sanitary at all times.

STORE FRONTS OF STRUCTURAL GLAZED UNITS

Create an Enticing Impression

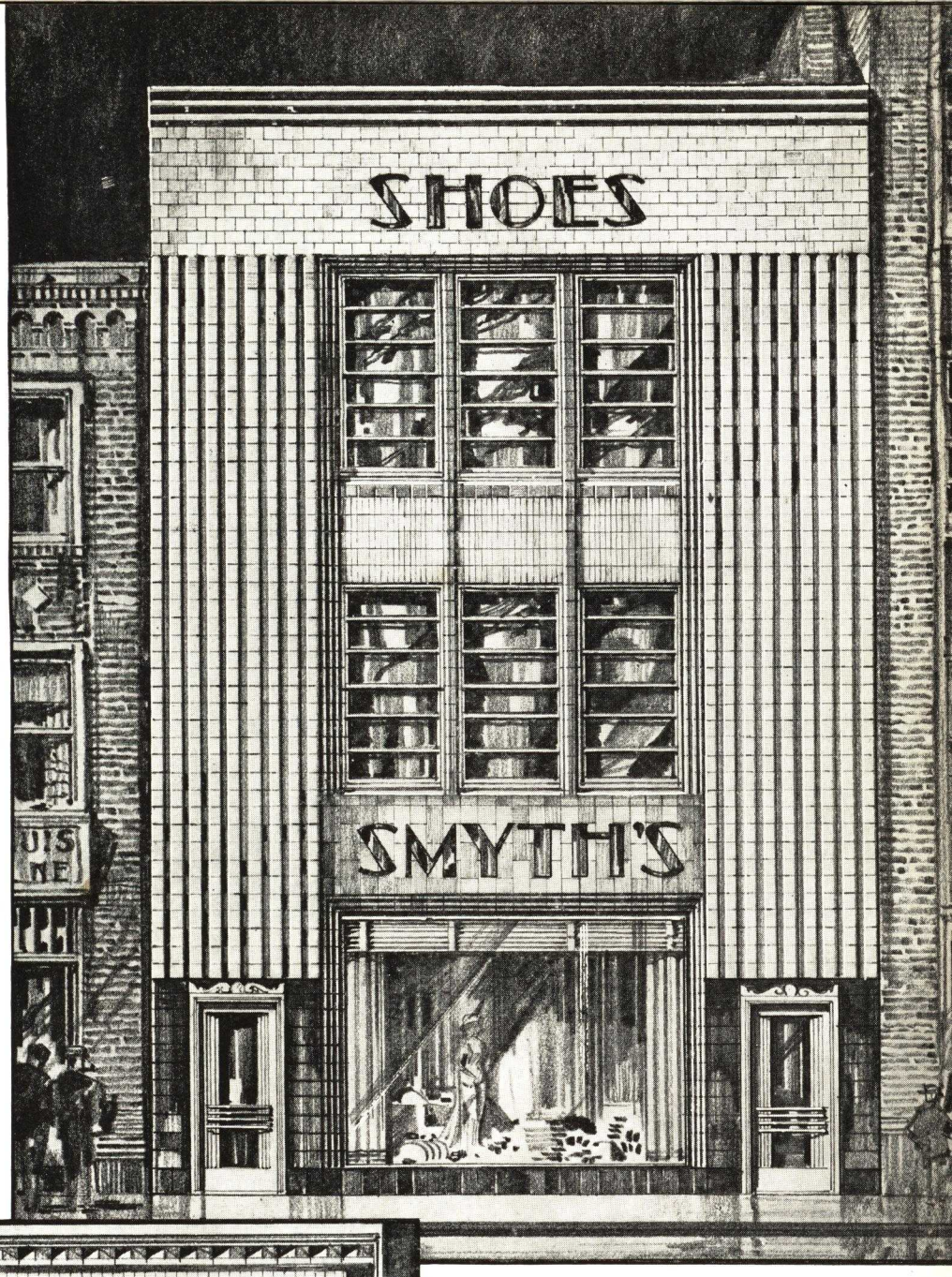
The buying public is more and more coming to realize that the outward appearance of a store presents a rather fair indication of the quality of material handled within, and the integrity of the owner.

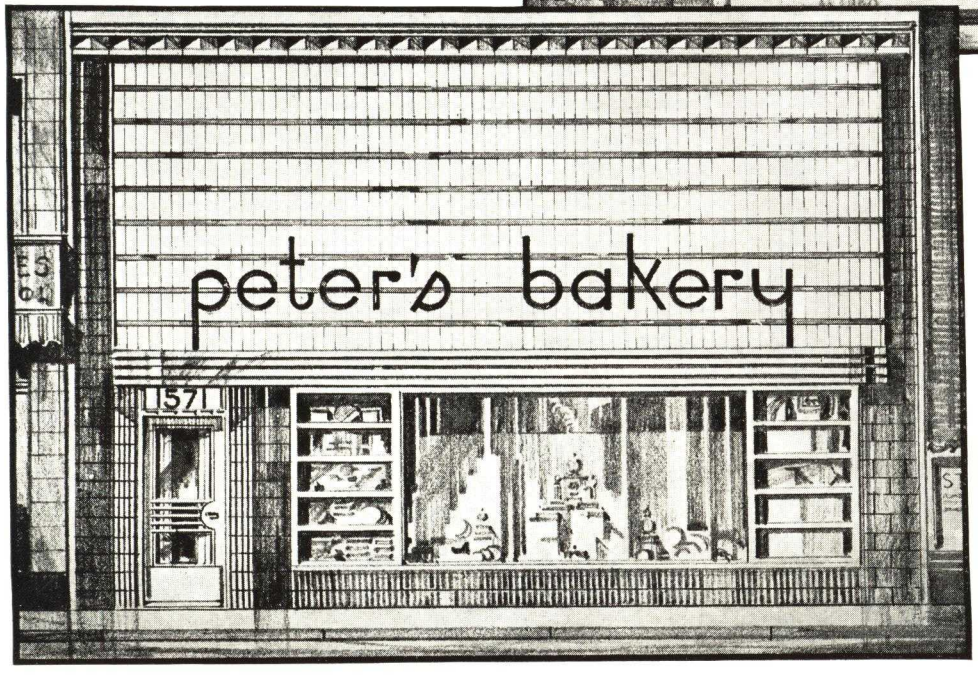
Store owners too are appreciating the value of a pleasing external appearance, and are utilizing to a full measure the strong sales appeal and proper mental reaction it has on the general public. They know that beauty and dignity in the outward appearance of their store creates a favorable impression of the establishment in the minds of the purchasers. It dramatically advertises externally, the class of goods and services available within.

The versatility of structural glazed units make them the logical material to use in remodelling or renovating jobs. This type of work is especially difficult, since the designer is confined to the proportions and general balance of the already constructed building. Hence he welcomes the variety of sizes and full range of colors available in structural glazed units which permit him to fit his creations properly and effectively within any size limitations.

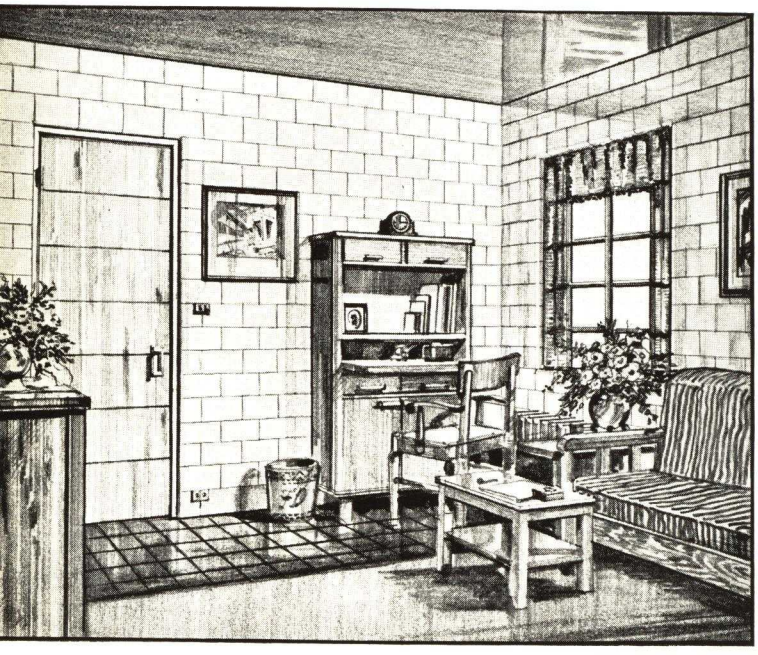
The designer can use structural glazed units with the full realization that the colors selected will be lasting and forever maintain their original brilliance and beauty, since the colors of structural glazed units are permanently burned into the finish. Also, there need be no fear of expensive cleaning jobs should the building be subjected to excessive dirt or smoke. The cleaning of structural glazed brick or tile can easily be accomplished through the simple application of soap and water, which restores the full and original luster of the units, for dirt cannot penetrate the glaze and the finish offers the minimum of adhesive possibilities.

For full expression of beauty and complete creation of that atmosphere of inviting elegance, structural glazed units respond most easily, effectively and beautifully.





A careful consideration of each quality demanded of the material used in the construction of the exteriors and interiors, particularly corridors and stair wells, of housing projects will find that structural glazed units have no equal.



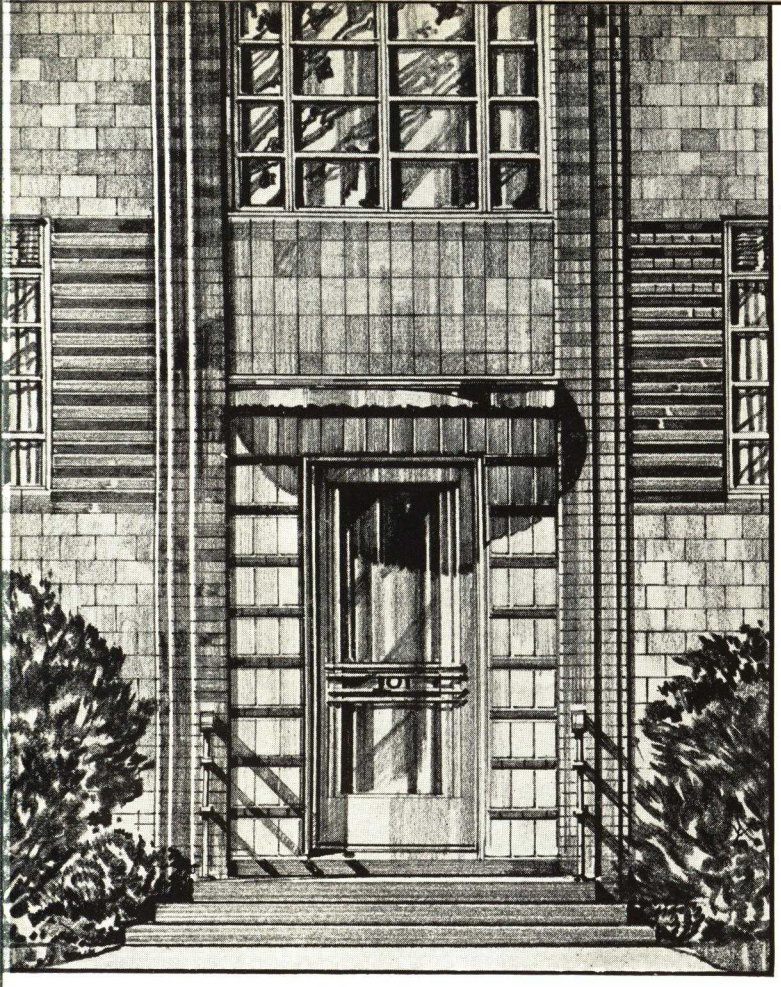
HOUSING PROJECTS AND STRUCTURAL GLAZED UNITS

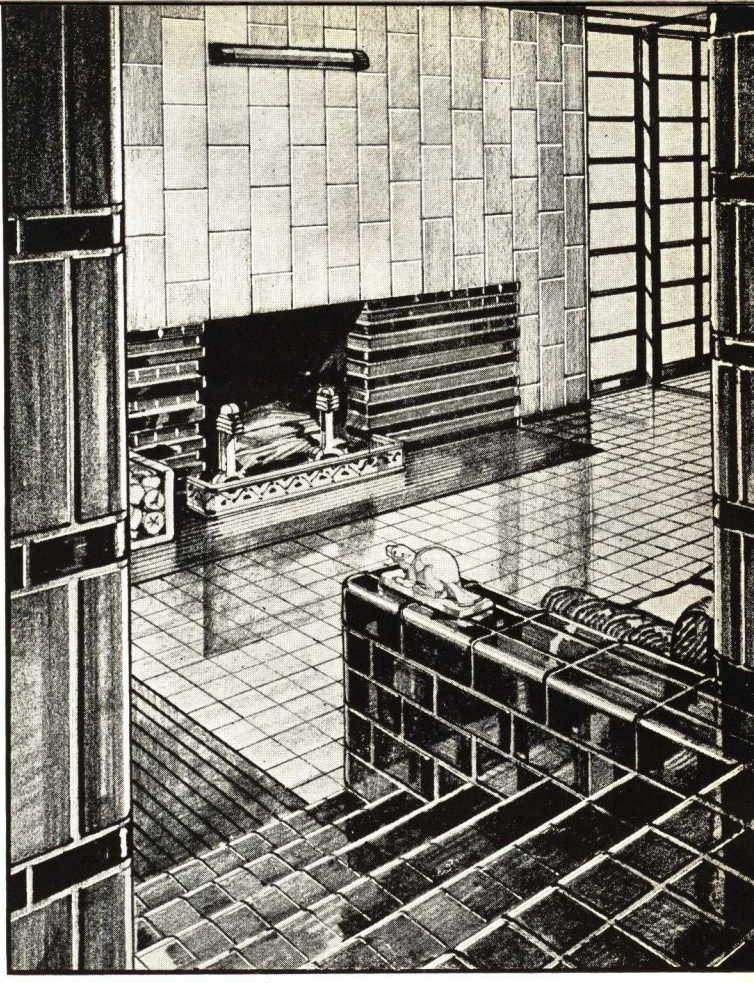
Go Hand in Hand

Large scale housing projects demand much from the material used in their construction. Usually financed for long term amortization periods, the materials used must carry out their respective functions with maintenance or replacements at a minimum.

It is therefore necessary that the material be permanent and not subject to weather deterioration. Likewise, it must have an inherent finish so as to eliminate refinishing of any nature, and in addition should be easy to keep clean and able to withstand the abuse of transient tenancy. Added to these utilitarian qualities, the material must have a variety of attractiveness.

Structural Glazed units answer every one of these demands, and add more. The variety of shapes, sizes and colors simplify the designer's problem of eliminating prosaic monotony and permit, without variation in design, many pleasing effects.





CHARACTER WITHOUT AND REFINEMENT WITHIN

Structural Glazed Units Offer the Ultimate in Apartment House Construction

Let that feeling of refinement and grace that greets you at the entrance permeate the interior and penetrate every room with its glow of pride in beauty and dignity.

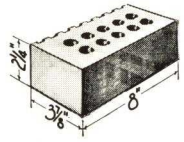
Structural glazed units have enlarged the area of charm. Their color, economy and other qualities have made it so much easier to beautify, that employment of their dignity and utility extends now from the entrance, throughout the interior and on to the recreation rooms, laundry, heating rooms, cellar and garage.

No longer do cellars represent wasted space and dark menacing areas harboring the trash of family life — they have grown to serve the family in a new and efficient manner, and structural glazed units have added much to this growth and usefulness.

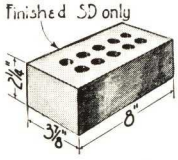
Again the qualities of glazed ware add to the pleasures of family life, for it is their light reflecting property, their beauty and cleanliness, their permanence and imperviousness to abuse and their economy through the entire absence of maintenance that has gained their universal acceptance for the finish of recreation and utility rooms.

SERIES "S" 2¼" x 8" FACE • • ONE BRICK EQUIVALENT UNITS

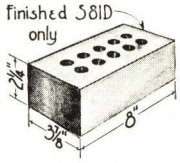
STRETCHER GROUP



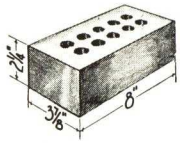
Sgr. Stretcher, Scored Back



Ssm Stretcher, Smooth Back
SD Two Face Stretcher



S81 Header
S81D Two Face Header

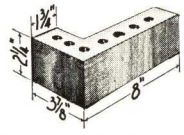


S2 Quoin
S2H Quoin, Half

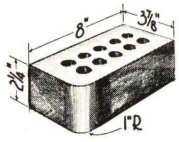
SA Soap Stretcher
S2A Soap Quoin (Square) 2" Return

Unless job conditions require either SMOOTH or SCORED BACK STRETCHERS, shipment may be facilitated by ordering S Stretchers, thereby permitting manufacturer to ship either the scored or smooth back stretchers or a mixture. Type and direction of SCORING and CORING are optional with each manufacturer. In general, each manufacturer standardizes on either the horizontal or vertical coring and does not supply both.

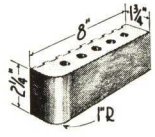
GROUP I SHAPES—Jambs, Corners and Octagons



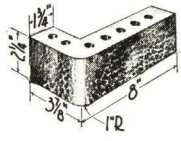
S2B Soap, Quoin (Sq.) Jamb, 4" Return



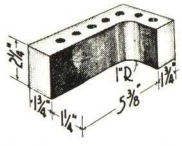
S4 Bullnose Jamb
S4H Same, Half



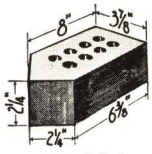
S4A Soap, Bullnose Jamb, 2" Return



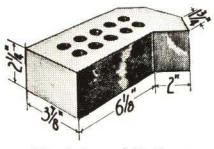
S4B Soap, Bullnose Jamb, 4" Return



S8 Coved Internal Corner

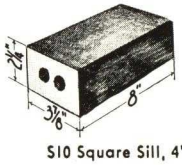


S6 External Octagon
S6A Same, Soap

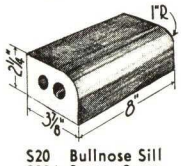


S9 Internal Octagon
S9A Same, Soap

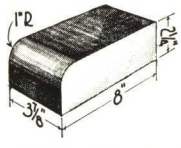
GROUP II SHAPES—Regular Sills



S10 Square Sill, 4" Reveal

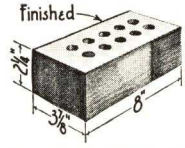


S20 Bullnose Sill
S20A Same, Soap
2" Reveal

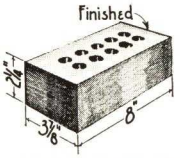


S821 Bullnose Sill Header
S811 Square Sill Header

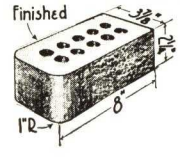
GROUP III SHAPES—Quoin (square) and Bullnose Wall Ends, Recessed Lintels



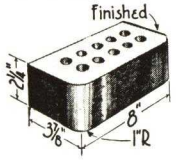
S3 Quoin (Square) End, 4" Wall
S3H Same, Half



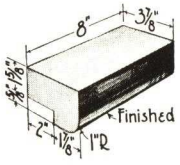
S83H Quoin (Square) End, 8" Wall



S5 Bullnose End, 4" Wall
S5H Same, Half

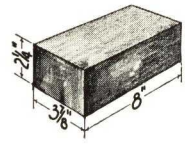


S85H Bullnose End, 8" Wall

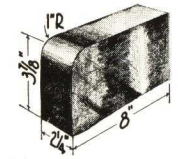


S720 Recessed Bullnose Lintel
S710 Recessed Square Lintel

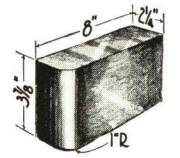
GROUP IV SHAPES—Handmade Fittings



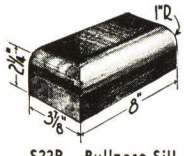
S12R Square Sill Quoin (Square) Right



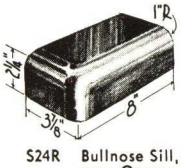
S14R Bullnose Rowlock Sill, Square End, Right



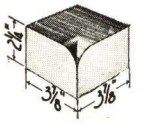
S15R Square Rowlock Sill, Bullnose End, Right



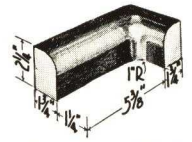
S22R Bullnose Sill, Quoin (Square) Corner, Right
S22HR Same, Half



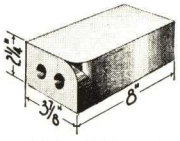
S24R Bullnose Sill, Bullnose Corner, Right
S24HR Same, Half



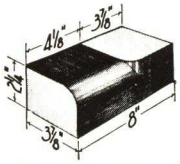
S27H Bullnose Sill, Internal Square Corner, Half



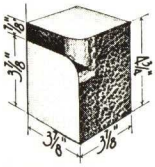
S28L Bullnose Sill, Coved Internal Corner, Left
S28HL Same, Half



S30R Bullnose Jamb Miter, Right
S30AR Same, Soap

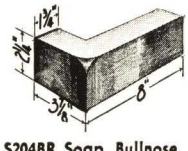


S31R Bullnose Sill and Jamb Miter, Right

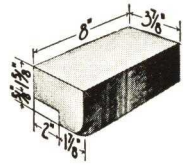


S34FR Rowlock Bullnose Sill Miter, Right

SILL SHAPES, shown above, are popular as cap and coping shapes.



S204BR Soap, Bullnose Starter, 4" Return, Right
S204AR Same, 2" Return



S730R Recessed Bullnose Lintel Miter, Right

GROUP V SHAPES includes Radial Stretchers and Fittings and Group IV Shapes with altered or additional finished faces.

An extra charge is made for cutting lengths or heights other than those shown or listed.

An electrically driven saw should be used for all cutting on the job.

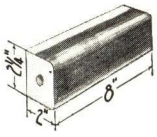
Nominal dimensions are usually given for returns, reveals, etc.; 2" is actually 1¾", 4" is actually 3⅞" and 6" is actually 5⅞".

Cove Base units are not made in one brick equivalents. For Cove Base units to be used with Series "S", see Pages 18 and 19.

For complete explanatory notes, see Page 23.

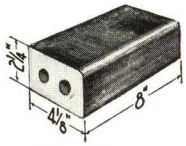
SERIES "S" 2¼" x 8" FACE • • ONE BRICK EQUIVALENT UNITS

GROUP II SHAPES



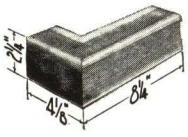
S40A Soap, Cap Stretcher, 2" Reveal

GROUP III SHAPES

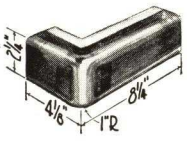


S40M Cap Stretcher, 4" Reveal

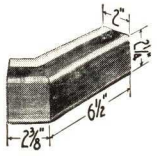
GROUP IV SHAPES—Handmade Fittings



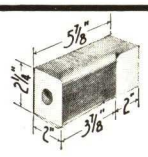
S42 Cap, Square Corner



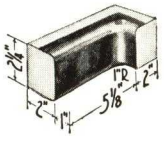
S44 Cap, Bullnose Corner



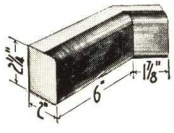
S46 Cap, External Octagon



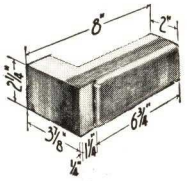
S47 Cap, Internal Square Corner



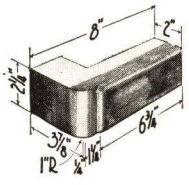
S48 Cap, Coved Internal Corner



S49 Cap, Internal Octagon



S402 Cap Starter Quoin (Square))Corner
S402A Same, Soap, 2" Return



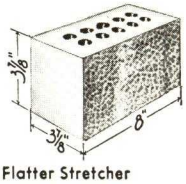
S404 Cap Starter, Bullnose Corner
S404A Same, Soap, 2" Return

Above moulding in 2¼" height is also furnished in lengths to fit Series "T". When ordering, prefix the letter "T" to shape number. (Example: TS40A is a Soap, Cap Stretcher, 2" Reveal, 12" long.)

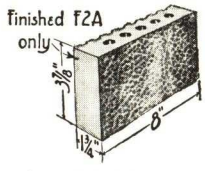
"F" SERIES—3⅜" x 8" FACE 1½ BRICK EQUIVALENT UNITS

USED AS ROWLOCK OR SOLDIER UNITS WITH "S" SERIES

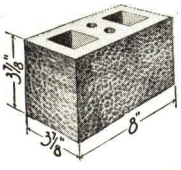
STRETCHER GROUP



F Flatter Stretcher

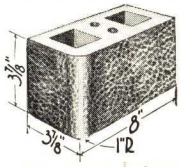


FA Flatter Soap
F2A Flatter Soap Quoin (Square)

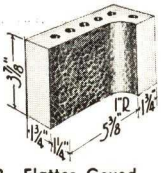


F2 Flatter Quoin (Sq)
F2H Same, Half

GROUP I SHAPES

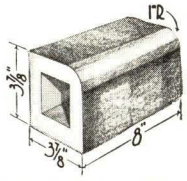


F4 Flatter Bullnose (Also Bullnose Sill Header)
F4H Same, Half



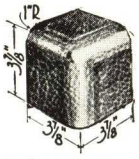
F8 Flatter, Coved Internal Corner
F8H Same 1¼" Return Each Face

GROUP II SHAPES

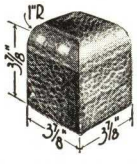


F20 Flatter Bullnose Sill
F10 Flatter Square Sill (Also used as Lintel and Corner Blocks)

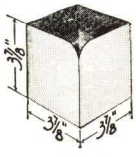
GROUP IV SHAPES—Handmade Fittings



F24H Flatter Bullnose Sill, Bullnose Corner, Half



F22H Flatter Bullnose Sill, Quoin (Square) Corner, Half



F27H Flatter Bullnose Sill, Internal Square Corner, Half
F30H Same Unit, used as Bullnose Miter

F28H Flatter Bullnose Sill, Coved Internal Corner, Half

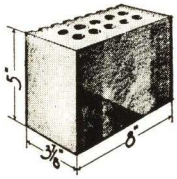
See Notes on Page 16 and complete explanatory notes on Page 23.

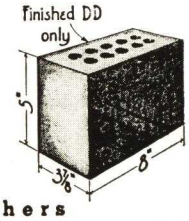
CHART OF STANDARD FINISHES AND COLORS

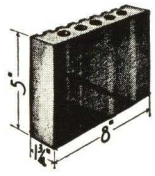
CERAMIC GLAZES			SALT GLAZES
FINISHES: Glossy - Satin - Matt			FINISH: Glossy
COLORS			COLORS
Light Shades		Trim Shades	Blends of:
White	Peach	Black	Maroon	Gray Shades
Cream	Tan	Brown	Green	Cream Shades
Ivory	Gray	Blue	Yellow	Light Buff Shades
Various Light Speckles		Stipples and Mottles of the above dark colors.		Dark Buff Shades
Stipples and Mottles of two or more of the above light colors. Mottles of light and trim colors, predominatingly of light colors.		Mottles of trim and light colors, predominatingly of dark colors.		
Special Colors are available by arrangement with the manufacturers.				

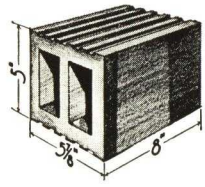
SERIES "D" 5"x8" FACE • • TWO BRICK EQUIVALENT UNITS

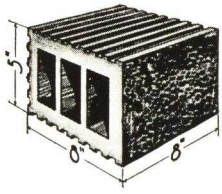
STRETCHER GROUP









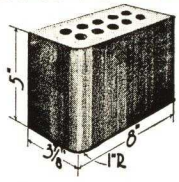


D Stretchers

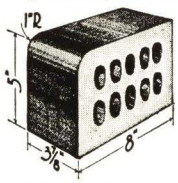
Dgr Stretcher, Scored Back — **Dsm Stretcher, Smooth Back** — **DD** Two Face Stretcher — **DA Soap Stretcher** — **D60 6" Bond Stretcher** — **D80 8" Bond Stretcher**

Unless job conditions require either SMOOTH or SCORED BACK STRETCHERS, shipment may be facilitated by ordering D-Stretchers, thereby permitting manufacturer to ship either the scored or smooth back stretchers or a mixture. Type and direction of SCORING and CORING are optional with each manufacturer. In general, each manufacturer standardizes on either the horizontal or vertical coring and does not supply both.

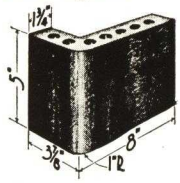
GROUP I SHAPES — Jambs, Corners and Octagons



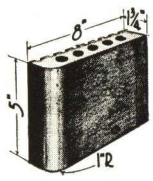
D4 Bullnose Jamb
D4H Same, Half
D2 Quoin (Square) Jamb
D2H Same, Half



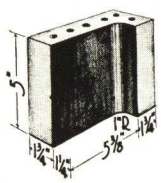
D821 Bullnose Sill Header
D811 Square Sill Header



D4B Soap, Bullnose Jamb, 4" Return
D2B Soap, Quoin (Sq.) Jamb, 4" Return

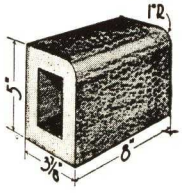


D4A Soap, Bullnose Jamb, 2" Return
D2A Soap, Quoin (Sq.) Jamb, 2" Return

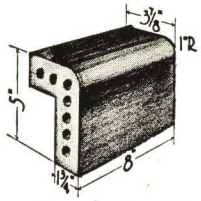


D8 Coved Internal Corner

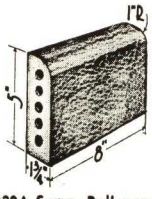
GROUP II SHAPES
Sill, Cap and Cove Stretchers



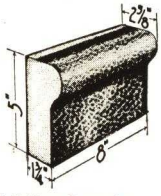
D20 Bullnose Sill, 4" Reveal
D10 Square Sill, 4" Reveal



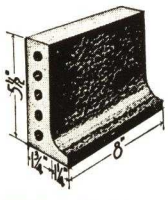
D20B Soap, Bullnose Sill, 4" Reveal
D10B Soap, Square Sill 4" Reveal



D20A Soap, Bullnose Sill, 2" Reveal
D10A Soap, Square Sill, 2" Reveal



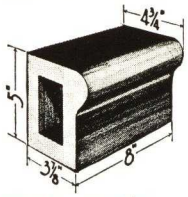
D40 Cap Stretcher 2" Reveal



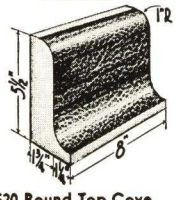
D50 Cove Stretcher

GROUP III SHAPES
Special Sill, Cap and Cove

D260 Slope Sill, 4" Reveal

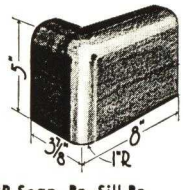


D40M Cap Stretcher, 4" Reveal

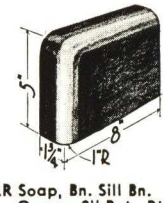


D520 Round Top Cove Stretcher
(Corners and Starters for this shape—Group V)

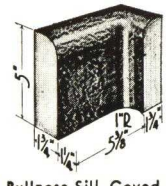
GROUP IV SHAPES



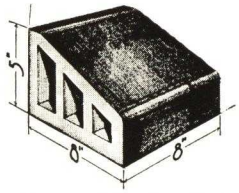
D24BR Soap, Bn. Sill Bn. Corner, 4" Ret., Rt.
D22BR Soap, Bn. Sill Square Cor., 4" Ret., Rt.



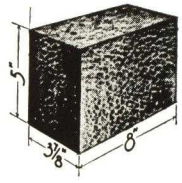
D24AR Soap, Bn. Sill Bn. Corner, 2" Ret., Rt.
D22AR Soap, Bn. Sill Square Cor., 2" Ret., Rt.



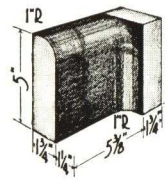
D28L Bullnose Sill, Coved Internal Corner, Left



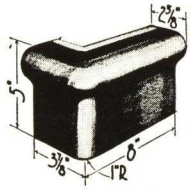
D8260 Slope Sill, 8" Reveal
D6260 Slope Sill, 6" Reveal



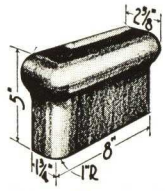
D12R Square Sill Quoin, Right



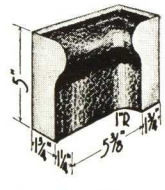
D208AL Soap, Bullnose Coping Starter, Left



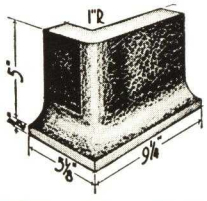
D44R Cap, Bullnose Corner, Right
D42R Cap, Square Corner, Right



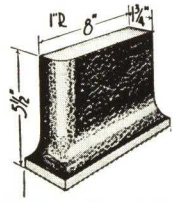
D44AR Soap Cap, Bn. Corner, 2" Return, Rt.
D42AR Soap Cap, Square Corner, 2" Ret. Right



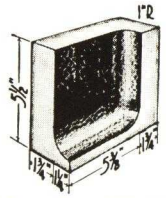
D48L Cap, Coved Internal Corner, Left



D54R Cove Bullnose Corner, Right
D52R Cove Quoin (Sq.) Corner, Right



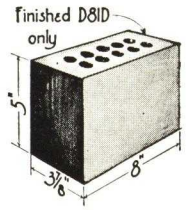
D54AR Soap, Cove Bullnose Corner, Right
D52AR Soap, Cove Quoin (Square) Corner, Right



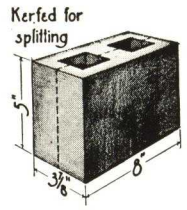
D58L Cove, Coved Internal Corner, Left

An extra charge is made for cutting lengths or heights other than those shown or listed. An electrically driven saw should be used for all cutting on the job.

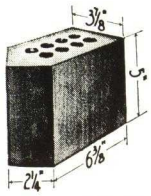
SERIES "D" 5"x8" FACE • • TWO BRICK EQUIVALENT UNITS



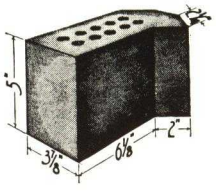
D81 Header
D81D Two Face Header



DV Kerfed Conduit Stretcher

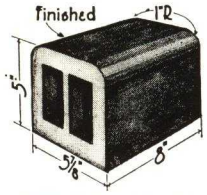


D6 External Octagon
D6A Same, Soap

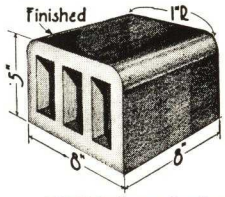


D9 Internal Octagon
D9A Same, Soap

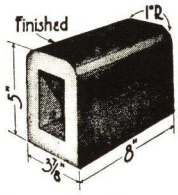
GROUP III SHAPES
Copings and Two Face Wall Ends



D620D Bullnose Coping, 6" Wall
D610D Square Coping, 6" Wall

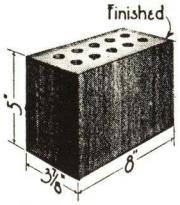


D820D Bullnose Coping, 8" Wall

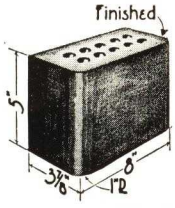


D20D Bullnose Coping, 4" Wall
D10D Square Coping, 4" Wall

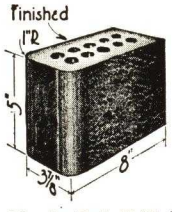
Above Shapes Also Used As Lintels



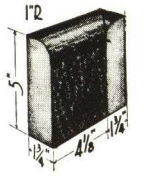
D83H Quoin (Square) End, 8" Wall



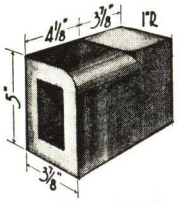
D85H Bullnose End, 8" Wall



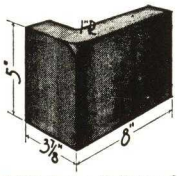
D5 Bn. End, 4" Wall
D5H Same, Half
D3 Quoin (Square) End, 4" Wall
D3H Same, Half



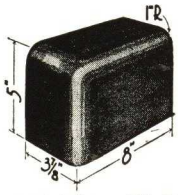
D27L Bullnose Sill, Internal Square Corner, Left



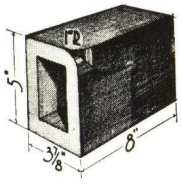
D31R Bullnose Sill Miter, Right



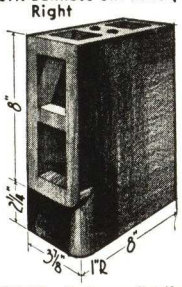
D204BR Soap, Bullnose Starter, 4" Ret., Right (Used with slope sills)
D204AR Same, 2" Return



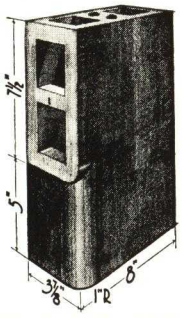
D24R Bullnose Sill, Bullnose Corner, Right
D22R Bullnose Sill, Quoin (Sq.) Corner, Rt.



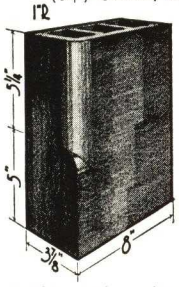
D30R Bullnose Miter, Right
D30AR Same, Soap



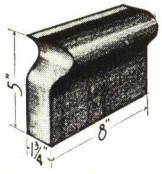
D34WR Bullnose Soldier Lintel Miter, Right
D34WAR Same, Soap 2" Return



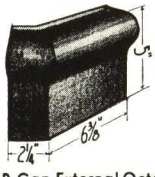
D34UR Bn. Soldier Lintel Universal Miter, Right
D34URA Same, Soap, 2" Return



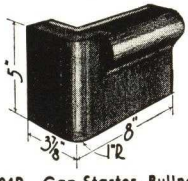
D34GR Bullnose Jamb Miter, Right (Used with slope sills)
D34GAR Same, Soap, 2" Return



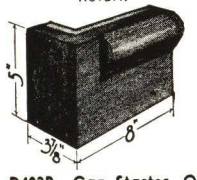
D47R Cap, Internal Coped, Right



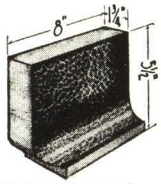
D46R Cap External Octagon, Right
D49L Cap Internal Octagon, Left (For Hor. Dim. see D59L)



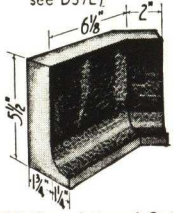
D404R Cap Starter, Bullnose, Right
D404AR Same, Soap, 2" Return



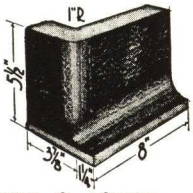
D402R Cap Starter, Quoin (Square) Right
D402AR Same, Soap, 2" Return



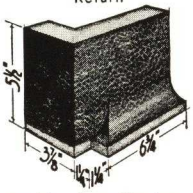
D57R Cove, Internal Coped, Right



D59L Cove Internal Octagon, Left
D56R Cove External Octagon, Right (For Hor. Dim. see D46R)

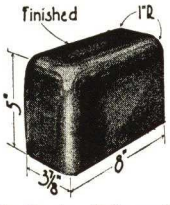


D504R Cove Starter, Bullnose, Right
D504AR Same, Soap, 2" Return

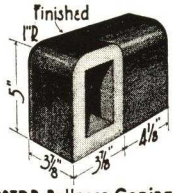


D502R Cove Starter, Quoin (Sq.), Right
D502AR Same, Soap, 2" Ret.

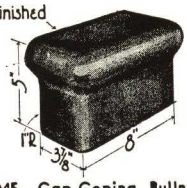
GROUP V SHAPES



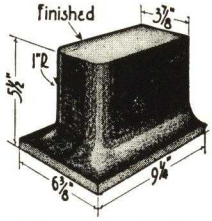
D25 Coping Bullnose End, 4" Wall
D25H Same, Half
D13 Square Coping End



D207DR Bullnose Coping Corner, 4" Wall, Right
D45H Same, half



D45 Cap Coping, Bullnose End, 4" Wall
D45H Same, Half

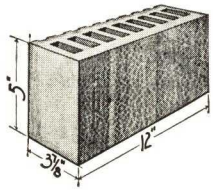


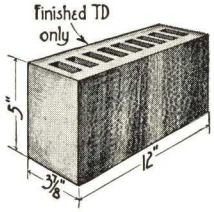
D55 Cove Bullnose End, 4" Wall

Nominal dimensions are usually given for returns, reveals, lengths, etc.; 2" is actually 1¾" 4" is actually 3⅞" and 6" is actually 5⅞". For complete explanatory notes see Page 23.

SERIES "T" 5"x12" FACE • • THREE BRICK EQUIVALENT UNITS

STRETCHER GROUP

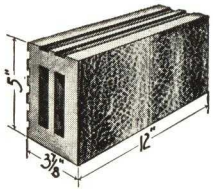


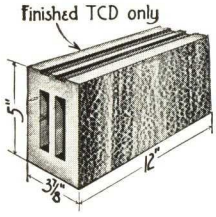


T-STRETCHERS

Tgr Stretcher, Scored Back

Tsm Stretcher, Smooth Back
TD Two Face Stretcher

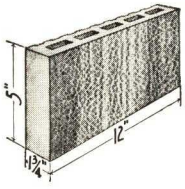




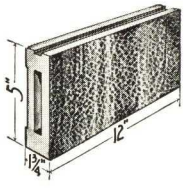
TC-STRETCHERS

TCgr Stretcher, Scored Back

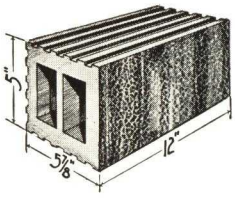
TCsm Stretcher, Smooth Back
TCD Two Face Stretcher



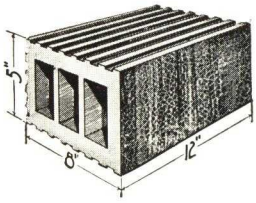
TA Soap Stretcher



TCA Soap Stretcher



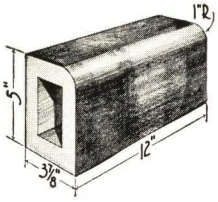
T60 6" Bond Stretcher
(Not furnished with Smooth Back or Two Face)



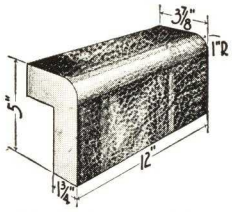
T80 8" Bond Stretcher
(Not furnished with Smooth Back or Two Face)

Unless job conditions require either SMOOTH or SCORED BACK STRETCHERS, shipment may be facilitated by ordering T-Stretchers, thereby permitting manufacturer to ship either the scored or smooth back stretchers or a mixture. Type and direction of SCORING and CORING are optional with each manufacturer. In general, each manufacturer standardizes on either the horizontal or vertical coring and does not supply both.

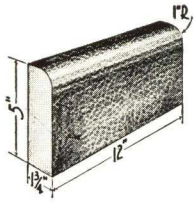
GROUP II SHAPES—Sill, Cap and Cove Stretchers



T20 Bullnose Sill
T10 Square Sill

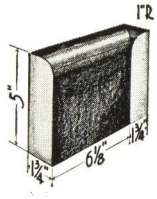


T20B Soap, Bullnose Sill, 4" Reveal

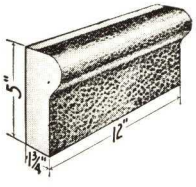


T20A Soap, Bullnose Sill 2" Reveal

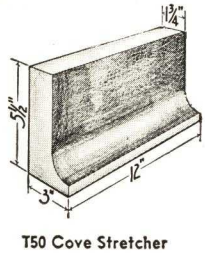
GROUP IV SHAPES



T27L Bullnose Sill, Internal Square Corner, Left

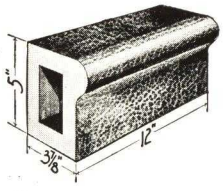


T40 Cap Stretcher
2" Reveal

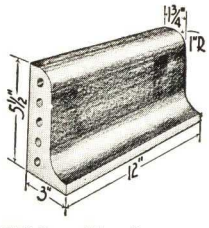


T50 Cove Stretcher

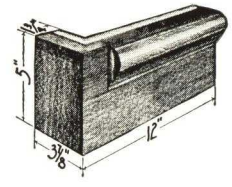
GROUP III SHAPES
Special Cap and Cove



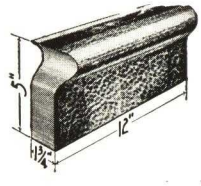
T40M Cap Stretcher, 4" Reveal



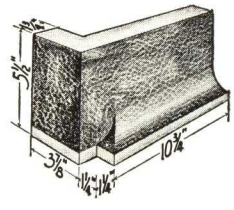
T520 Round Top Cove
(Corners and Starters furnished for this shape —Group V)



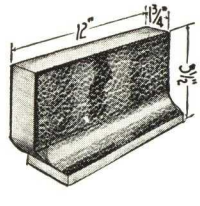
T402R Cap Starter, Quoin (Square) Corner, Right
T402AR Same, Soap, 2" Ret.



T47R Cap, Internal Coped, Right



T502R Cove Starter, Quoin (Square) Corner, Right
T502AR Same, Soap, 2" Ret.

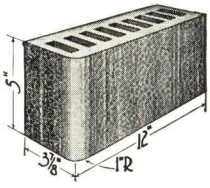


T57R Cove, Internal Coped Right

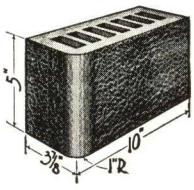
An extra charge is made for cutting lengths or heights other than those shown or listed.
An electrically driven saw should be used for all cutting on the job.

SERIES "T" 5"x12" FACE • • THREE BRICK EQUIVALENT UNITS

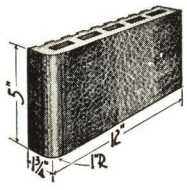
GROUP I SHAPES



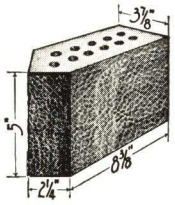
T4 Bullnose Jamb
T4H Same, Half
T2 Quoin (Square) Jamb
T2H Same, Half



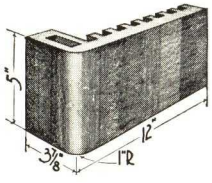
TG4 Bullnose Corner



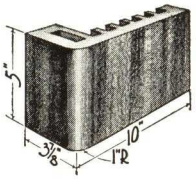
T4A Soap, Bullnose Jamb, 2" Return
T2A Soap, Quoin (Square) Jamb, 2" Return



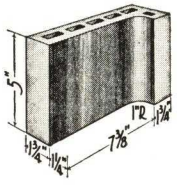
T6 External Octagon
T6A Same, Soap



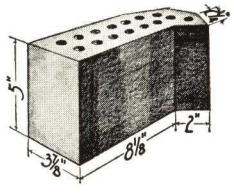
T4B Soap, Bullnose Jamb, 4" Return
T2B Soap, Quoin (Square) 4" Return



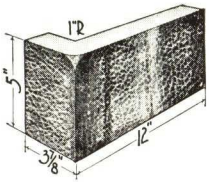
TG4B Soap, Bullnose Corner 4" Return



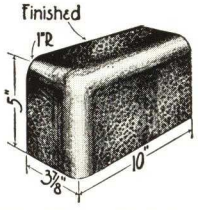
T8 Coved Internal Corner



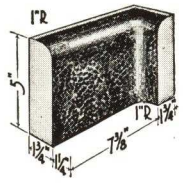
T9 Internal Octagon
T9A Same, Soap



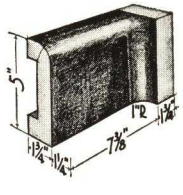
T204BR Soap, Bullnose Starter, Right (Used with Slope Sills)



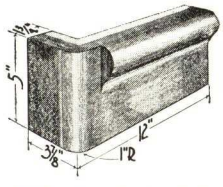
TG24R Bullnose Sill, Bullnose Corner, Right
TG24BR Same, Soap, 4" Return
T24HR Bullnose Sill, Bullnose Corner, Right, 6" Long
T22HR Bullnose Sill, Quoin (Sq.) Corner, Rt., 6" Long



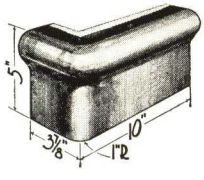
T28L Bullnose Sill, Coved Internal Corner, Left



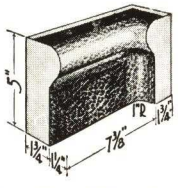
T208AL Soap, Bullnose Coping Starter, Left



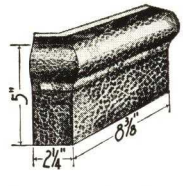
T404R Cap Starter, Bullnose Corner, Right
T404AR Same, Soap, 2" Return



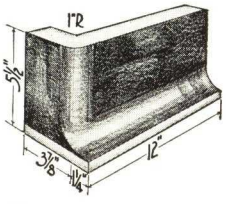
TG44R Cap, Bn. Corner, Rt.
T44HR Same, 6" Long
T42HR Cap, Quoin (Sq.) Corner, Right, 6" Long



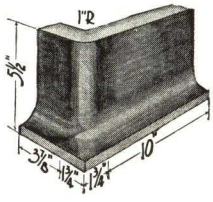
T48L Cap, Coved Internal Corner, Left



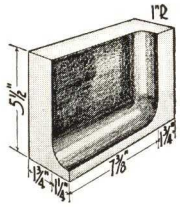
T46R Cap, External Octagon, Right
T49L Cap, Int. Octagon, Left. (For horizontal Dimensions see T59)



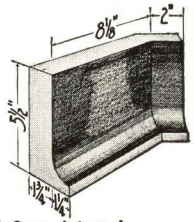
T504R Cove Starter, Bullnose, Right
T504AR Same, Soap, 2" Ret.



TG54R Cove, Bullnose Corner, Right
T54HR Same, 6" Long
T52HR Cove, Quoin (Sq.) Corner, Right 6" Long



T58L Cove, Coved Internal Corner, Left

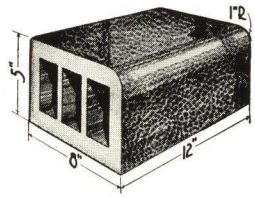


T59L Cove, Internal Octagon, Left
T56R Cove, External Octagon, Right (For hor. dim. see T46)

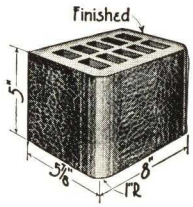
Nominal dimensions are usually given for returns, reveals, lengths, etc.; 2" is actually 1¾", 4" is actually 3⅞" and 6" is actually 5⅞". For complete explanatory notes, see Page 23.

SERIES "T" 5"x12" FACE • • THREE BRICK EQUIVALENT UNITS

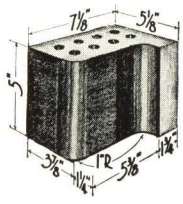
GROUP III SHAPES—Two Face Wall Ends, Copings and Specials



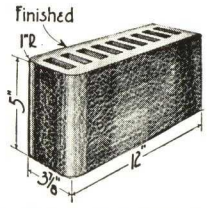
T820 Bullnose Sill, 8" Reveal
T810 Square Sill, 8" Reveal



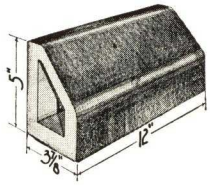
T85H Bullnose End, 8" Wall
T83H Quoin (Square) End, 8" Wall



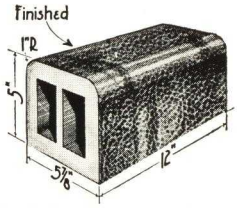
T38 Bullnose and Coved Corner
T38A Same, Soap, 2" Bullnose Return



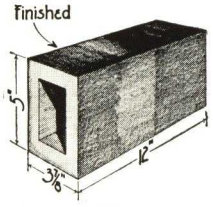
T5 Bullnose End, 4" Wall
T5H Same, Half
T3 Quoin (Sq.) End, 4" Wall



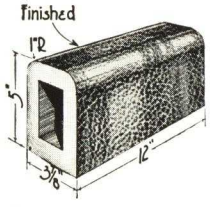
T260 Slope Sill



T620D Bullnose Coping, 6" Wall
T610D Square Coping, 6" Wall

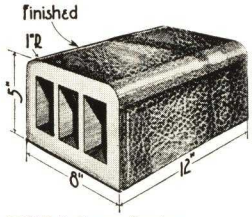


T10D Square Coping, 4" Wall

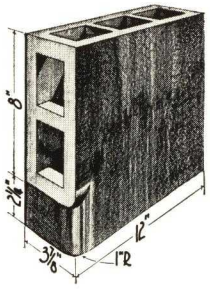


T20D Bullnose Coping, 4" Wall

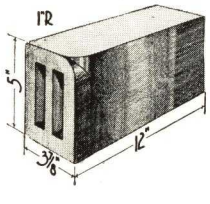
GROUP IV SHAPES



T820D Bullnose Coping, 8" Wall
T810D Square Coping, 8" Wall

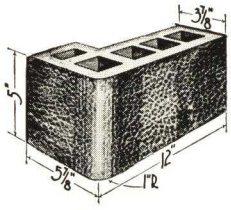


T34WR Bullnose Soldier Lintel Miter, Right
T34WAR Same, Soap, 2" Return

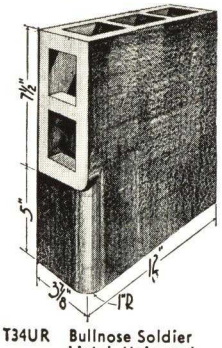


T30R Bullnose Miter, Right
T30AR Same, Soap, 2" Return

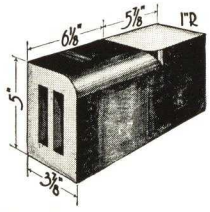
GROUP II SHAPES



T4N Bullnose Corner, 6" Return
T4E Same, Soap
T2N Square Corner, 6" Return
T2E Same, Soap

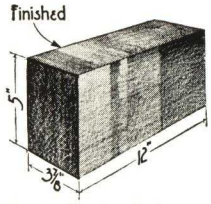


T34UR Bullnose Soldier Lintel, Universal Miter, Right
T34UAR Same, Soap, 2" Return

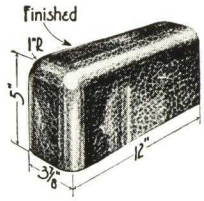


T31R Bullnose Sill Miter, Right

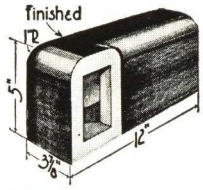
GROUP V SHAPES



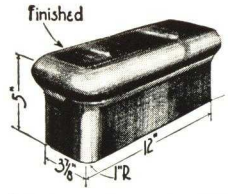
T13 Square Coping End, 4" Wall



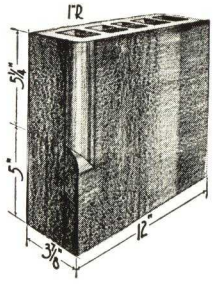
T25 Bullnose Coping, Bullnose End, 4" Wall
T25H Same, Half



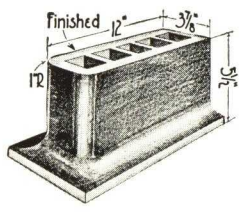
T207DR Bullnose Coping Corner, 4" Wall, Right



T45 Cap Coping, Bullnose End, 4" Wall
T45H Same, Half



T34GR Bullnose Jamb Miter, Right
(Used with slope sills)
T34GAR Same, Soap, 2" Return



T55 Cove, Bullnose End 4" Wall
T55H Same, Half

An extra charge is made for cutting lengths or heights other than those shown or listed.
An electrically driven saw should be used for all cutting on the job.

NATIONAL SHAPE STANDARDIZATION

EXPLANATORY NOTES

The glazed brick and tile shapes are arranged according to series. These series are based on face dimensions of the stretcher unit. (The standard depth or bed dimension of full shapes in all series, unless otherwise noted, is 3⅞" and that of soaps is 1¾".) Each series is designated by a letter which is also used as a prefix to the shape number in this handbook as follows:

Series	*S*	*F*	*D*	*G*	*T*	*W*
Height in Inches..	2¼	3⅞	5	5	5	8
Length in Inches..	8	8	8	10	12	16¼

The shapes in each series are classified into groups according to the amount of special shop work required in the manufacture and percentage of kiln recovery. In the arrangement of illustrations in each series, an attempt has been made to segregate the units into their respective shape groups. In general, the units are classified in shape groups as follows:

Shape Group	*Type of Shapes Generally Included*
Stretcher	Plain face stretcher units
Group I	Jambs, Header Sills, Coved Corner and Octagons
Group II	Cap, Cove and Sill Stretchers
Group III	Recessed Lintels, Two face wall ends, Copings and other Double Radius Stretchers
Group IV	Handmade Fittings
Group V	Group IV Shapes with Altered or Additional Finished Faces

Salt Glazed 6" and 8" bonding stretchers are classified as two face stretchers when ordered either glazed two face or smooth back.

RETURN indicates the depth of the finished head or short face of a closure unit.

REVEAL indicates the depth of the top face of a sill or cap or the bottom face of a lintel.

RIGHT OR LEFT HAND SHAPES shown are available in the opposite hand. When facing a shape and the long face is to the right, it is a Right Hand, and vice versa. (Suffix L is left and suffix R is right.)

QUOINS are corner units with right angle (square) edges. It is unnecessary to order quoins in salt glazed or clay coated units unless more than 15% of the total stretcher order is required in quoins.

BULLNOSE RADIUS. 1" Radius Bullnose is standard. Any radius other than 1" will take the next higher shape group.

ANGULAR SHAPES of odd size (other than 90° and 45°) are made on special order. They are Group III if plane surface; Group V if cove, cap or other irregular profile.

RADIALS. Radial stretchers (plane profile) and Fittings are Group V. Made on special order only.

ARCH UNITS are Group IV shapes—made to special order only.

SPECIAL CAPS, COVES, ETC., having profile other than shown as standard are made to special order only. Such specials are classed in a Shape Group higher than that for similar standard shape.

DECORATIVE UNITS with stenciled patterns are available on special order.

STANDARD GRADING RULES FOR GLAZED BRICK AND TILE

FIRST QUALITY OR A-GRADE

Units of the highest structural and mechanical quality with shading consistent with the manufacturing processes employed, and with the following maximum size tolerances:

TOLERANCES FOR FIRST QUALITY OR A-GRADE

The variation from the standard dimensions of glazed units shall not exceed the maximums shown below, nor shall the variation on any job exceed these maximums:

Where the length of unit is:	8"	12"	16¼"	
Variation in dimension shall not exceed:	1/8"	3/16"	1/4"	
Where the height of unit is:	2¼"	5"	8"	
Variation in dimension shall not exceed:	1/16"	3/32"	1/8"	
Where the depth of unit is:	1¾"	3⅞"	5⅞"	8"
Variation in dimension shall not exceed:	5/16"	3/16"	3/16"	1/4"

Dimensions intermediate to those shown, shall have tolerances of next larger dimension.

DISTORTION FROM PLANE OR EDGE OR FACE OF FIRST QUALITY OR A-GRADE UNITS

The maximum tolerance for distortion of the plane and/or the edge of the face of A-Grade glazed units shall be:

1-Brick Equivalent size	(17 to 19 sq. in.)	3/64"
1½ and 2-Brick Equivalent size	(20 to 41 sq. in.)	1/16"
2½ and 3-Brick Equivalent size	(42 to 63 sq. in.)	3/16"
6½ Brick Equivalent size	(117 to 129 sq. in.)	¼"
Larger sizes		5/16"

and only a reasonable percentage of all units shall approach the maximum.

Note: When units which are either concave or convex are laid upon a plane surface, the apparent variation is greater than the actual variation from the plane of the unit.

SECOND QUALITY OR B-GRADE

Units imperfect mechanically, and/or slightly chipped and with shade variation, and with glaze or coating defects and/or with size variations exceeding the maximum tolerances permitted for First Quality or A-Grade.

THIRD QUALITY OR C-GRADE

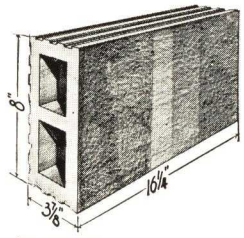
Merchantable units having pronounced mechanical or glaze imperfections and/or noticeably chipped and with substantial shade variation and with no limit as to size variation and distortion.

FOURTH QUALITY OR D-GRADE

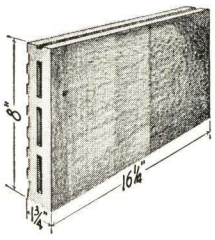
Units which will not meet the specifications of the above grades, and which are sold for uses similar to those of common brick.

SERIES "W" 8" x 16¼" FACE • • SIX and one-half BRICK EQUIVALENT UNITS

STRETCHER GROUP

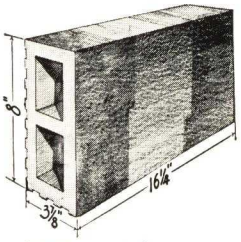


W Stretcher
W1 Same, Half

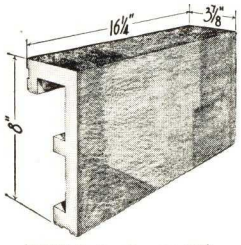


WA Soap Stretcher
W1A Same, Half

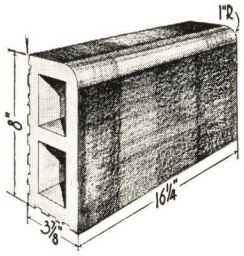
GROUP II SHAPES



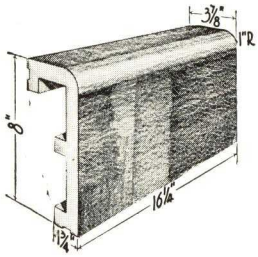
W10 Square Sill
W11 Same, Half



W10B Soap, Square Sill, 4" Reveal
W11B Same, Half
W10A Soap, Square Sill, 2" Reveal
W11A Same, Half

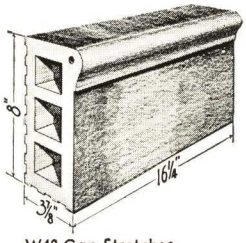


W20 Bullnose Sill
W21 Same, Half

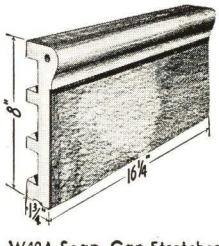


W20B Soap, Bn. Sill, 4" Rev.
W21B Same, Half
W20A Soap, Bn. Sill, 2" Rev.
W21A Same, Half

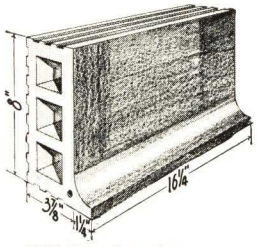
The above SILL SHAPES are popular for cap and coping.



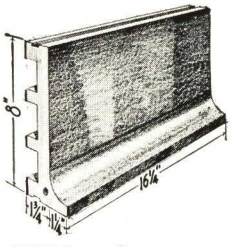
W40 Cap Stretcher
W41 Same, Half



W40A Soap, Cap Stretcher
W41A Same, Half

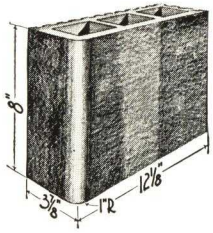


W50 Cove Stretcher
W51 Same, Half

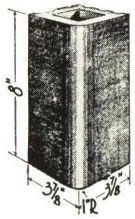


W50A Soap, Cove Stretcher
W51A Same, Half

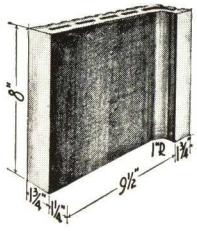
GROUP I SHAPES



WM4 Bullnose Jamb
WM2 Quoin (Square) Jamb

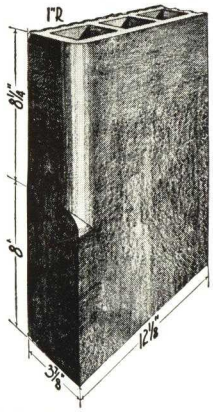


W4Q Bullnose Jamb, 4" Long
W2Q Quoin (Sq.) Jamb, 4" Long

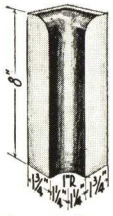


W8 Coved Internal Corner

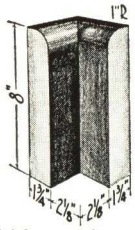
GROUP IV SHAPES



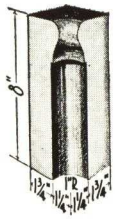
WM34R Bullnose Jamb Miter, Right (Used with Slope Sills)



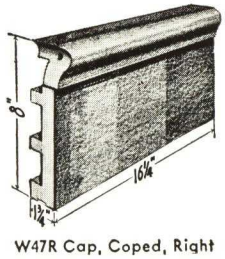
W28H Soap, Bullnose Sill Internal Coved Corner



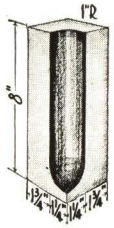
W27H Soap, Bullnose Sill, Internal Square Corner



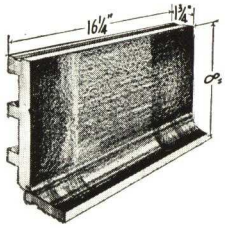
W48H Cap, Internal Coved Corner



W47R Cap, Coped, Right



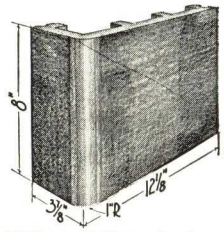
W58H Cove, Internal Coved Corner



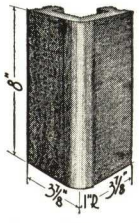
W57R Cove, Coped, Right
W57HR Same, Half

An extra charge is made for cutting lengths or heights other than those shown or listed.
An electrically driven saw should be used for all cutting on the job.

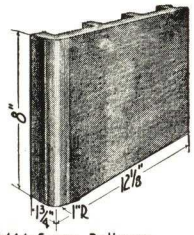
SERIES "W" 8" x 16¼" FACE • • SIX and one-half BRICK EQUIVALENT UNITS



WM4B Soap, Bullnose Jamb 4" Return
WM2B Soap, Quoin (Sq.) Jamb, 4" Return

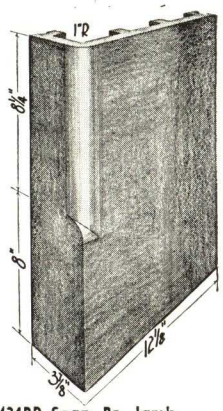


W4BQ Soap, Bullnose Jamb, 4" Return, 4" Long
W2BQ Soap, Quoin (Sq.) Jamb, 4" Return, 4" Long

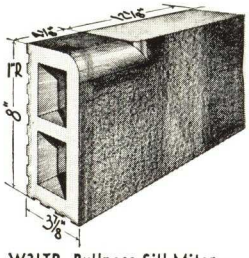


WM4A Soap, Bullnose Jamb, 2" Return
WM2A Soap, Quoin (Sq.) Jamb, 2" Return

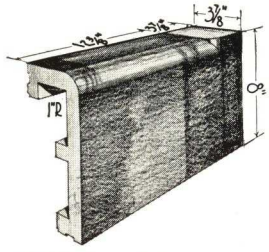
W4AQ Soap, Bullnose Jamb, 2" Return, 4" Long
W2AQ Soap, Quoin (Sq.) Jamb 2" Return, 4" Long



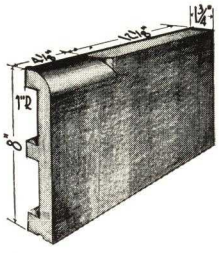
WM34BR Soap, Bn. Jamb Miter, Right, 4" Ret.
WM34AR Same, 2" Ret.



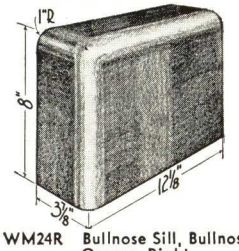
W31TR Bullnose Sill Miter, Right, 12" Jamb
W31QR Same, 4" Jamb



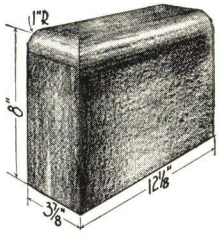
W31QBR Soap, Bullnose Sill Miter, Right 4" Jamb, 4" Rev.
W31TBR Same, 12" Jamb



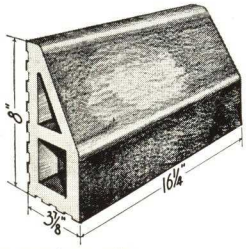
W31TAR Soap, Bullnose Sill Miter, Right, 12" Jamb, 2" Rev.
W31QAR Same, 4" Jamb



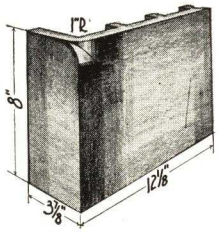
WM24R Bullnose Sill, Bullnose Corner, Right
WM24AR Same, Soap, 2" Ret.
W24HR Bullnose Sill, Bn. Corner, Right, 8" Long
W24AHR Same, Soap, 2" Ret.



WM22R Bullnose Sill, Square Corner, Right
WM22AR Same, Soap, 2" Ret.
W22HR Bullnose Sill, Square Corner, Right, 8" Long
W22AHR Same, Soap, 2" Ret.

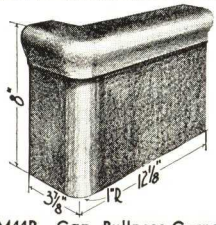


W260 Slope, Sill
W261 Same, Half

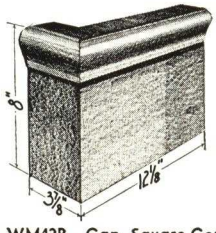


WM30BR Soap, Bullnose Miter, Right, 4" Return
WM30AR Same, 2" Return

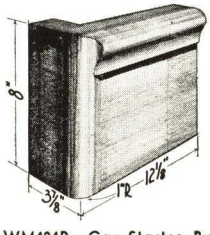
SILL SHAPES, shown above, are popular also as Cap and Coping Shapes



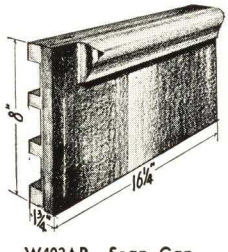
WM44R Cap, Bullnose Corner, Rt.
WM44AR Same, Soap, 2" Ret.
W44HR Cap, Bullnose Corner, Right, 8" Long
W44AHR Same, Soap, 2" Ret.



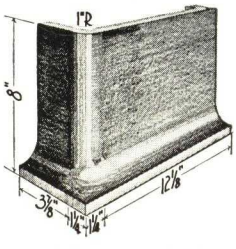
WM42R Cap, Square Corner, Rt.
WM42AR Same, Soap, 2" Ret.
W42HR Cap, Square Corner, Right, 8" Long
W42AHR Same, Soap, 2" Ret.



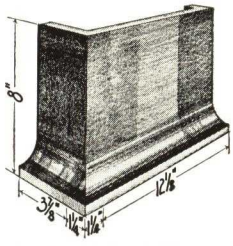
WM404R Cap Starter, Bullnose Rt.
WM404AR Same, Soap, 2" Ret.
W404HR Cap Starter, Bullnose Rt., 8" Long
W404AHR Same, Soap, 2" Ret.



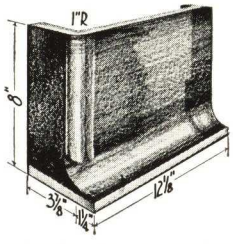
W402AR Soap, Cap Starter Quoin (Square), Right
W402AHR Same, Half



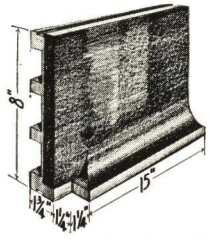
WM54R Cove, Bullnose, Right
WM54AR Same, Soap, 2" Return
W54HR Cove, Bullnose Right, 8" Long
W54AHR Same, Soap, 2" Ret.



WM52R Cove, Square Corner, Rt.
WM52AR Same, Soap, 2" Ret.
W52HR Cove, Square Corner, Right, 8" Long
W52AHR Same, Soap, 2" Ret.



WM504R Cove Starter, Bullnose, Rt.
WM504AR Same, Soap, 2" Ret.
W504HR Cove Starter, Bullnose, Right, 8" Long
W504AHR Same, Soap, 2" Ret.



W502AR Soap, Cove Starter, Square Right
W502AHR Same, Half

Nominal dimensions are usually given for returns, lengths, etc.; 2" is actually 1¾", 4" is actually 3⅞" and 6" is actually 5⅞". For complete explanatory notes, see page 23.

4/33

STANDARD SPECIFICATIONS FOR GLAZED BRICK AND TILE

1. DESCRIPTION Structural Glazed Ware for the walls of (Schedule of rooms) shall be First Quality (Salt Glazed) or (Ceramic Glazed) Structural Glazed units made on a fire clay body. The field units shall be (State color and Shade No.) with units for (Cove Course, Cap Course, Trim, Borders, Panels, Etc.) and shall conform to the samples submitted and approved for this operation. The plans show the general scheme of decorative treatment and indicate where the colors are to be used.

2. SIZES AND SHAPES Units shall be (State Face Dimensions) in face size and 1¾", 3⅞", 5⅞" or 8" in thickness as shown on the plan. All necessary shapes shall be furnished as required. In general, all external corners, sills, jambs and lintels shall be bullnosed. At the floor there shall be a base (with or without cove) in shade (contrasting to or the same as) the shade used in the field. (If a cap course is desired, state type and shade). (If header or bonding courses are to be used, so state . All two face walls or partitions shall be built of two single face units bonded.

3. QUALITY All units shall be of the highest structural and mechanical quality with shading consistent with manufacturing processes and samples approved. All units shall be reasonably straight and true with finished faces free from chips, crazes, blisters, crawling and other imperfections noticeable at a distance of 5 feet. All units shall conform to Standard Grading Rules of Glazed Brick and Tile Institute on page 23.

4. FINISH All surfaces that will be exposed when the units are laid in the wall, shall be finished with a uniform glaze which shall cover all exposed surfaces thoroughly.

4a. The glaze of a ceramic unit shall be:
- (a) Matt—(non-reflecting)
- (b) Satin
- (c) Glossy—(Lustrous—image reflecting)

4b. The glaze of ceramic glazed units or the finish of a clay coated unit shall be applied prior to final burning and shall be made permanent and vitreous by burning.

4c. The glaze of salt glazed units shall be produced by introducing salt into the fire during the burning process.

4d. Salt glazed products shall not be used where ceramic glazed is specified.

4e. Clay coated shall not be used where ceramic glazed is specified.

4f. Facing Tile shall not be used where glazed or coated products are specified.

5. CORING All units may be either solid or cored up to 45% of the gross sectional area. When specified for use in Post Office workrooms or places where walls are unprotected against continuous heavy impact, units shall not be cored to exceed 25%.

6. TESTS ON CERAMIC GLAZES 6a. Crazing, Spalling, Peeling and Cracking: A definitely controlled and recorded steam autoclave test shall be made as follows: Three units carefully marked for identification shall be tested. They shall be thoroughly dry and then placed in an autoclave and the steam pressure started and slowly brought up to between 25 and 30 pounds pressure in thirty minutes, the pressure then increased gradually to between 65 and 75 pounds in the next fifteen minutes, then increased gradually to 150 pounds in not less than fifteen minutes. The pressure shall then be held at 150 pounds, plus or minus 5 pounds, for a period of one hour. The pressure shall then be released by a gradual opening of the autoclave to allow a gradual cooling over a period of not less than thirty minutes, to room or hand-handling temperature. The brick shall then be removed and examined. Ink shall then he applied to the finish and allowed to stand for five minutes, the surface washed with a wet cloth and running water and any development of crazing, spalling, peeling or cracking may be cause for rejection.

6b. Imperviousness: Liquid ink or Methylene blue shall be applied liberally to the finish, and allowed to stand for five minutes. The surface shall then be washed with a wet cloth and running water, and examined. If any trace of the ink or Methylene blue shall remain, it may be cause for rejection, except with a matt, stippled or mottled finish, a slight discoloration in depressions will not be cause for rejection.

6c. Opacity of Finish: If opacity of the finish of the glazed face is required it may be tested by applying ink or Methylene blue to the body of the burned product close to the finished surface. It may be grounds for rejection if, after five minutes, there is any visible indication of penetration of the coating by the liquid when viewed through the glazed surface.

6d. Acid Resistance: A portion of the finished surface of one or more units shall be submerged in a 10% solution of hydrochloric acid for three hours, cleaned and examined. The color and/or luster of the finish shall not be altered by this treatment.

7. SALT GLAZES Salt glazes shall have a smooth, lustrous, light reflecting surface, resistant to the acid test for Ceramic Glazes and resistant to pencil and crayon marks.

8. CLAY COATED This shall have a dull non-reflecting coating which will resist ink stains.

9. FACING TILE This shall be a "face brick" finish devoid of coating and subject to the same size and structural tolerance as glazed ware.

10. ABSORPTION OF BODY When the units are intended for use where exposed to frost action, the absorption of the body of the unit by 24-hour submersion in cold water shall not exceed 14 per cent, and in addition the units shall conform to at least one of the following requirements for absorption:

The absorption by 24-hour submersion in cold water shall not exceed 7 per cent.

The ration of the absorption by 24-hour submersion in water to the absorption by 5-hour submersion in boiling water shall not exceed 0.80.

11. PACKAGING All A-Grade Ceramic Glazed, Salt Glazed and Clay Coated units shall be shipped in cartons or trays.

PHYSICAL CHARACTERISTICS OF GLAZED BRICK AND TILE AND FACING TILE

Ceramic Glazes:

Ceramic glazes are compounded of chemicals, thoroughly ground together and sprayed on a previously formed fire clay body. The sprayed unit is then burned at a temperature over 2000° F. which fuses the glaze to the body in such fashion that it is impossible to separate the two, as their co-efficients of expansion are identical and hence the glaze becomes an integral part of the body. The glazes are produced in various colors to give light reflection or light absorption. They are non-absorbent, are resistant to all acids (except Hydrofluoric); and will resist exterior weather conditions in the most severe climates.

Salt Glaze:

Salt glaze is applied to a fire clay body as a vapor while the units are at a temperature over 2000° F. The resultant glaze, being transparent, presents the color of the fire clay body — gray, cream, or buff. Salt Glaze (sodium iron silicate) is smooth, lustrous (image reflecting) resists pencil or chalk markings, and is one of the oldest known forms of glazing. Salt Glazed ware produced centuries ago is still in an excellent state of preservation and without doubt it is the most economical form of sanitary wall construction. To obtain the highest degree of sanitation, the smooth and lustrous finish as manufactured by members of Glazed Brick and Tile Institute should be insisted upon.

Clay Coated:

Clay coated is a high grade smooth unit manufactured from fire clay. Its vitreous surface is non-absorbent and is available in a variety of colors.

Facing Tile:

The term "Facing Tile" is used to designate unglazed units of fire clay in 5″x8″, 5″x12″ Face and larger sizes manufactured by members of the Glazed Brick and Tile Institute. These units are furnished in all the various shapes illustrated on pages 18 to 22 inclusive, and are manufactured with smooth faces in pleasing buff and gray shades. The Standard Grading Rules, page 23, apply also to Facing Tile, except that references to glaze and coating are omitted.

Facing Tile as manufactured by members of the Institute, is a quality product, and gives less absorption and more sanitation than most other units other than the Glazed or Coated products manufactured by the members of the Institute. Facing Tile used as a load-bearing material, compares favorably with the cost of plastered walls and never needs replacing or repainting. Facing Tile, like glazed ware, should be shipped in trays or cartons.

CLEANING METHODS

The use of acid is unnecessary to clean any glazed product conforming with the specifications of the Glazed Brick and Tile Institute. Although acid will not harm the glaze of the unit, it may damage the mortar joint. The wall should be kept clean of excess mortar as the work progresses by merely removing with a cloth.

Following completion, it should be scrubbed with a bristle brush and strong soap and water. Abrasives should never be used.

PURPOSE OF THE GLAZED BRICK AND TILE INSTITUTE

The Glazed Brick and Tile Institute was formed and is maintained by the responsible and progressive manufacturers of glazed brick and tile for the purpose of progress, coordination and simplification. Its aim is constant improvement in the material produced, and to make always available to the architectural profession and the building industry, a product representing the last word in quality and beauty.

It presents a codification of the highest standards of quality, and in simplification it strives to coordinate the physical dimensions of all units. Thus the architect is definitely assured of quality and ease in use, since he is able to design and specify from a single set of specifications with full knowledge that regardless of material used, when furnished by a member of the Glazed Brick and Tile Institute, the shapes and sizes furnished will be identical, and quality will meet the rigid Institute requirements.

MEMBER COMPANIES

Arketex Ceramic Corporation

Cambria Clay Products Company

Continental Clay Products Company

Hydraulic Press Brick Company

National Fireproofing Corporation

The Claycraft Company

Hanley Company

The Mapleton Clay Products Company

The Stark Brick Company

GLAZED BRICK AND TILE INSTITUTE

Affiliated with

STRUCTURAL CLAY PRODUCTS INSTITUTE

1427 EYE ST., N.W. • WASHINGTON, D. C.

CAT. 39

HYDRAULIC-PRESS BRICK COMPANY

Manufacturers and Distributors of Hy-tex Brick

ST. LOUIS, MO.

BRANCH OFFICES, EXHIBIT ROOMS AND DISTRIBUTING CENTERS

CHICAGO, ILL., Builders' Building
DAVENPORT, IOWA, Putnam Building
DUBOIS, PA., Deposit National Bank Building
INDIANAPOLIS, IND., Board of Trade Building
KANSAS CITY, MO., 56th and Lister Streets
NEW YORK, N. Y., 295 Madison Avenue
PEORIA, ILL., Lehmann Building
PHILADELPHIA, PA., Otis Building
ROSEVILLE, OHIO
SOUTH PARK, OHIO
WASHINGTON, D. C., Colorado Building

REPRESENTATIVES

NEW YORK, N. Y., Fredenburg & Lounsbury, Architects Building, 101 Park Avenue

AUTHORIZED DISTRIBUTORS IN PRINCIPAL CITIES

Member of Glazed Brick and Tile Institute

Hy-tex Products

Hy-tex

A complete line of Face Brick; Enamel Brick; Ceramic Glaze Brick; Equitable Brick; Salt Glaze Brick; Common Brick; Paving Brick; Hollow Building Tile; and Swimming Pool Linings. Also Haydite, the ideal lightweight aggregate for concrete and Lightweight Haydite Building Units.

Company and Service

The Hydraulic-Press Brick Company has been specializing in the manufacture of Face Brick for over a half century.

With modern plants located in seven great clay producing states and in close proximity to the principal markets, its facilities are adequate to handle operations of any kind.

Process

In the manufacture of Hy-tex Brick, both the "Dry Press" and "Stiff Mud" processes of manufacture are used.

Hy-tex Dry Press Brick are made under a forty-ton hydraulic pressure on machines of the Company's own invention, and, after burning, have an absorption low enough to prevent penetration, yet sufficient to guarantee a perfect bond between brick and mortar joint.

Hy-tex Stiff Mud Brick are semi-vitreous, and practically impervious to moisture.

Face Brick

Hy-tex Face Brick are produced in a great variety of soft, natural color tones, ranging through Reds, Browns, Blacks, Buffs, Tans and Grays. They are obtainable in uniform shades, or in combination of various color ranges, in smooth, semi-smooth and sand struck finishes, or in a number of distinctive rough textures.

Literature

Booklets on Hy-tex Enamel and Polychromatic Decoration; Hy-tex Equitables; Hy-tex Ceramic and Salt Glaze Brick; Hy-tex Swimming Pools; Bonds and Mortars in the Wall of Brick; Brick Scales and Tables; and other material. Apply to nearest branch office.

ENAMEL, CERAMIC AND SALT GLAZE PRODUCTS

Hy-tex Enamel Brick

A genuine hand dipped Enamel brick manufactured by the two-burn process on a dry press fire clay bisque. Standard colors are White, Cream, Ivory, Green, Jade, Blue, Brown, Black, Yellow, Red and Transparent Speckled Buff. Manufactured in standard on edge (8x2¼x3⅞ in.) and standard on flat (8x3⅞x2¼ in.) size units.

Hy-tex Ceramic Glazes

A bright, satin-like, vitreous glaze product of the highest quality, produced in smooth and stippled textures, in "S" series standard size (8x2¼x3⅞ in.) and "D" series—"Two Brick Equivalent" (8x5x3⅞ in.) units. Standard shades are as follows:

Light Shades

Shade No. 356 White
Shade No. 594 Cream
Shade No. 845 Gray, Light
Shade No. 915 Cream Grays
Shade No. 1040 White Stipple
Shade No. 1049 Cream Buff Stipple

Trim Shades

Shade No. 661 Jade Green
Shade No. 742 Apple Green
Shade No. 747 Apple Green Stipple
Shade No. 603 Royal Blue
Shade No. 662 Black
Shade No. 667 Black Ripple
Shade No. 1176 Chocolate

Hy-tex Equitable Brick

A dull, china glazed brick, devoid of gloss, made in White and White Speckled shades. These bricks were originally developed for use in the Equitable Life Insurance Building, New York, and have since been used in many large projects, including the Chrysler Building and the New York Hospital-Cornell College Association Group of New York.

Hy-tex Salt Glazes

A transparent salt glaze burned into the exposed surfaces. Manufactured in Gray-tones, Buff-tones, and Golden Brown shades, in "S" series standard size (8x2¼x3⅞ in.) and "D" series—Two Brick Equivalent (8x5x3⅞ in.) units. Standard shades are as follows:

Shade No. 72 Gray-tone
Shade No. 73 Buff-tone
Shade No. 752 Light Brown
Shade No. 753 Medium Brown
Shade No. 754 Dark Brown

Hy-tex Molded Shapes

Refer to standardized shapes of the Glazed Brick and Tile Institute, of which we are members. For catalog see File Index. Exception—Radius on Hy-tex Enamel Brick is 1½ in.

Hy-tex Swimming Pools

The fitness of Hy-tex Enamel and Ceramic Glaze Brick for pool linings is at once obvious. Their durable and beautiful surface, which will not peel or discolor, admits of perfect cleansing with a minimum of labor.

HYDRAULIC-PRESS BRICK COMPANY

GLAZED WARE PLANTS

St. Louis, Mo. Sparland, Ill. Brazil, Ind. Cowan, Pa. Reynoldsville, Pa. Winslow Junction, N. J.

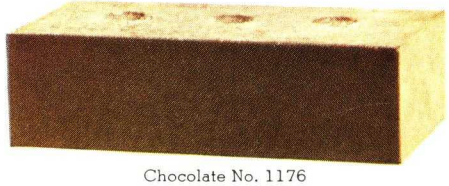
Gray-tone Salt Glaze No. 72

Buff-tone Salt Glaze No. 73

Cream No. 594

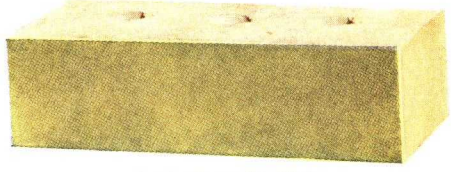
White No. 356

Equitable No. 120



Chocolate No. 1176

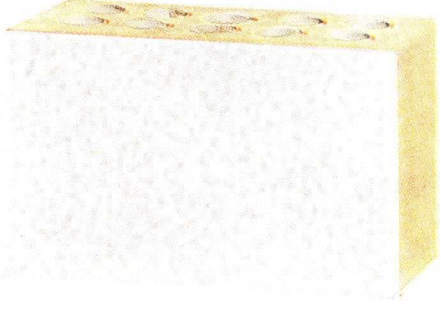
Jade Green No. 661



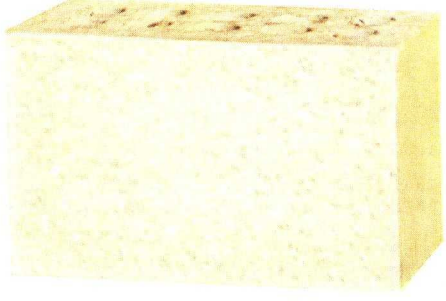
Apple Green No. 742

Blue No. 603

Black No. 662



White Stipple No. 1040



Cream Stipple No. 1049

A Complete Line of Smooth, Ripple and Stipple Applications

Write for Samples

FOR MOULDED SHAPE INFORMATION SEE CATALOG OF GLAZED BRICK AND TILE INSTITUTE AS LISTED IN FILE INDEX

50 YEARS
1889-1939

50 YEARS OF SERVICE TO THE BUILDING INDUSTRY

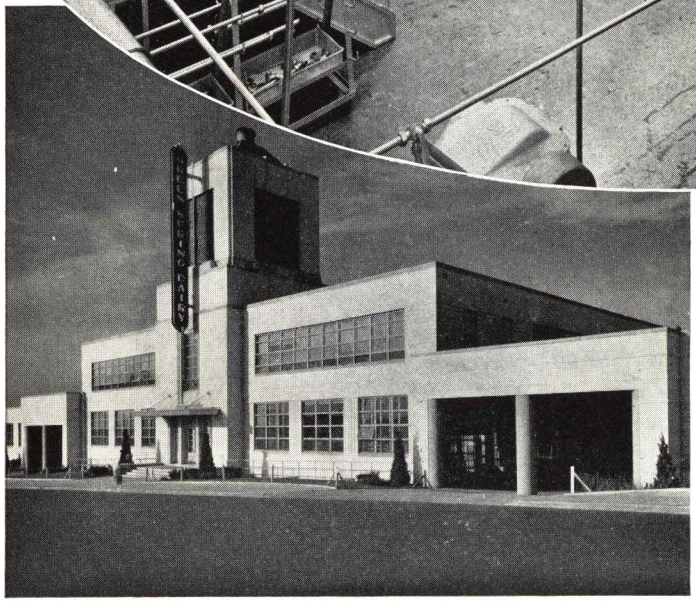
GLAZED STRUCTURAL FACING TILE

natco

NATIONAL FIREPROOFING CORPORATION

50
YEARS
1889-1939

natco GLAZED



Used for interior walls of dairy, food product, bakery, beverage and similar buildings, Natco Glazed Structural Facing Tile gives the utmost in sanitation and light-reflecting qualities. In addition, the smooth, impervious, glass-hard, wall surfaces afford no lodging place for bacteria—are easily cleaned and kept clean.

Above shows the exterior of the Green Spring Dairy, Baltimore, Maryland, also an interior view of the pasteurizing room which is lined throughout with Natco Glazed Vitritile in an extremely pleasing ivory finish, furnished through the Baltimore Brick Company. Lucius R. White, Jr., of Baltimore was the architect and the Consolidated Engineering Company of Baltimore were the general contractors.

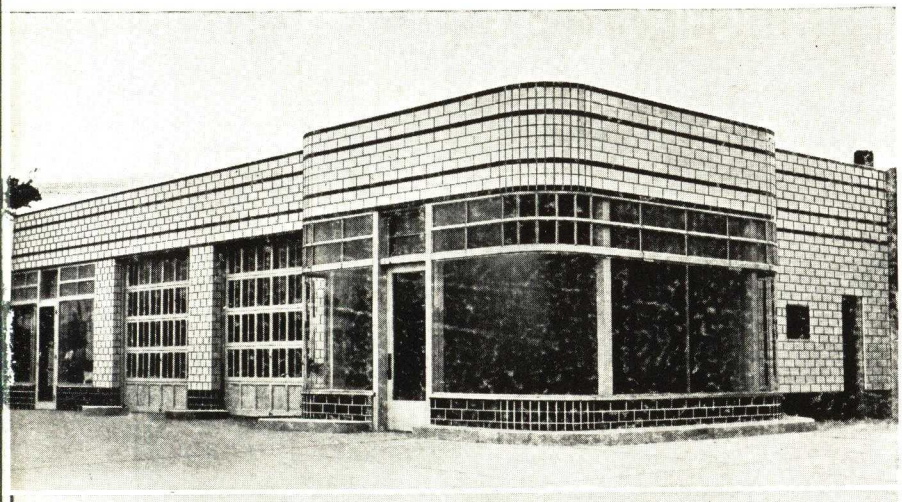
FOR WALLS OF ENDURING BEAUTY

That Natco Glazed Structural Facing Tile is receiving increased preference from architects for walls, partitions and wainscots in public, institutional, commercial and industrial buildings of every type and kind is due to its pleasing appearance, sanitary qualities, ease of cleaning, insulation advantages, as well as savings in erection and maintenance costs. It readily adapts itself to strikingly modern as well as conservative decorative wall treatments.

All of the different types illustrated and described are made of selected fire clay and cured and burned under the direction of experienced ceramic engineers. The deairing process is used in its manufacture. This removes all entrapped air from the clay before it is formed into shape, eliminates surface imperfections and promotes true and even edges.

50 Years of Service to the Building Industry

STRUCTURAL FACING TILE

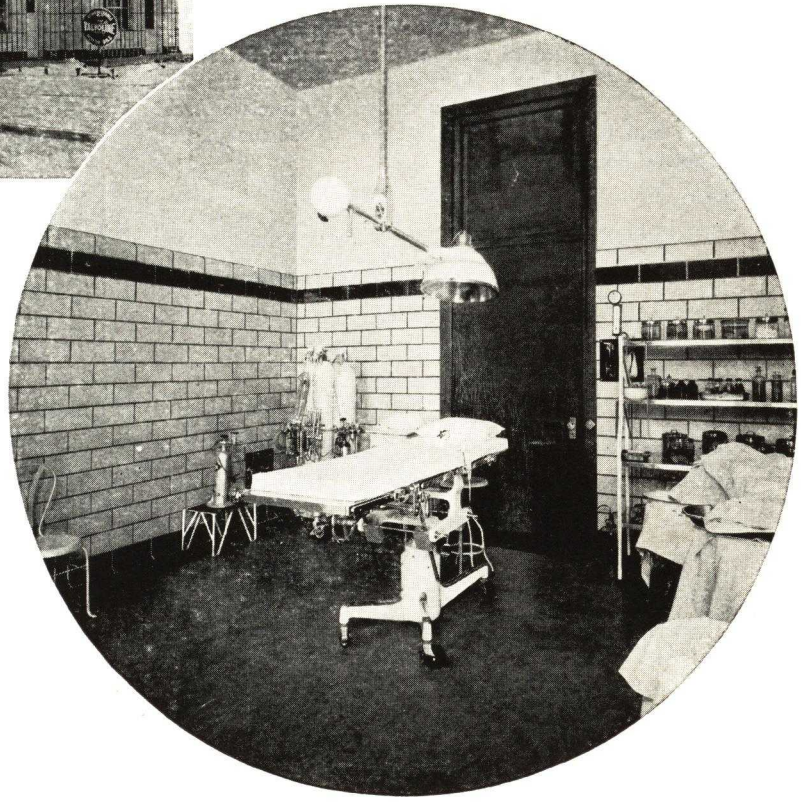


For permanent architectural beauty in exterior wall construction, Natco Glazed Structural Facing Tile, with its wide variety of colors and mottles, in high gloss or matt finishes is adaptable for any type of building.

The illustration at the upper left shows a combination store and garage building in Sterling, Colorado, in which Natco Vitritile "V" Series was used. The ivory ceramic glaze used for the field, combined with the dark green tile used for the trim, proved very attractive.

The illustration, immediately below, shows Natco Decorata "W" Series in the Valley Oil Service Station, Rockford, Illinois. White and gray mottled tile was used with black base, with a dark green tile for the trim, an extremely pleasing combination.

Illustration at bottom shows Natco Glazed Vitritile, "V" Series, used for lining the operating room, St. Francis Hospital, Pittsburgh. Gray and buff mottled tile was used for the field with glossy black tile for the base and belt courses.



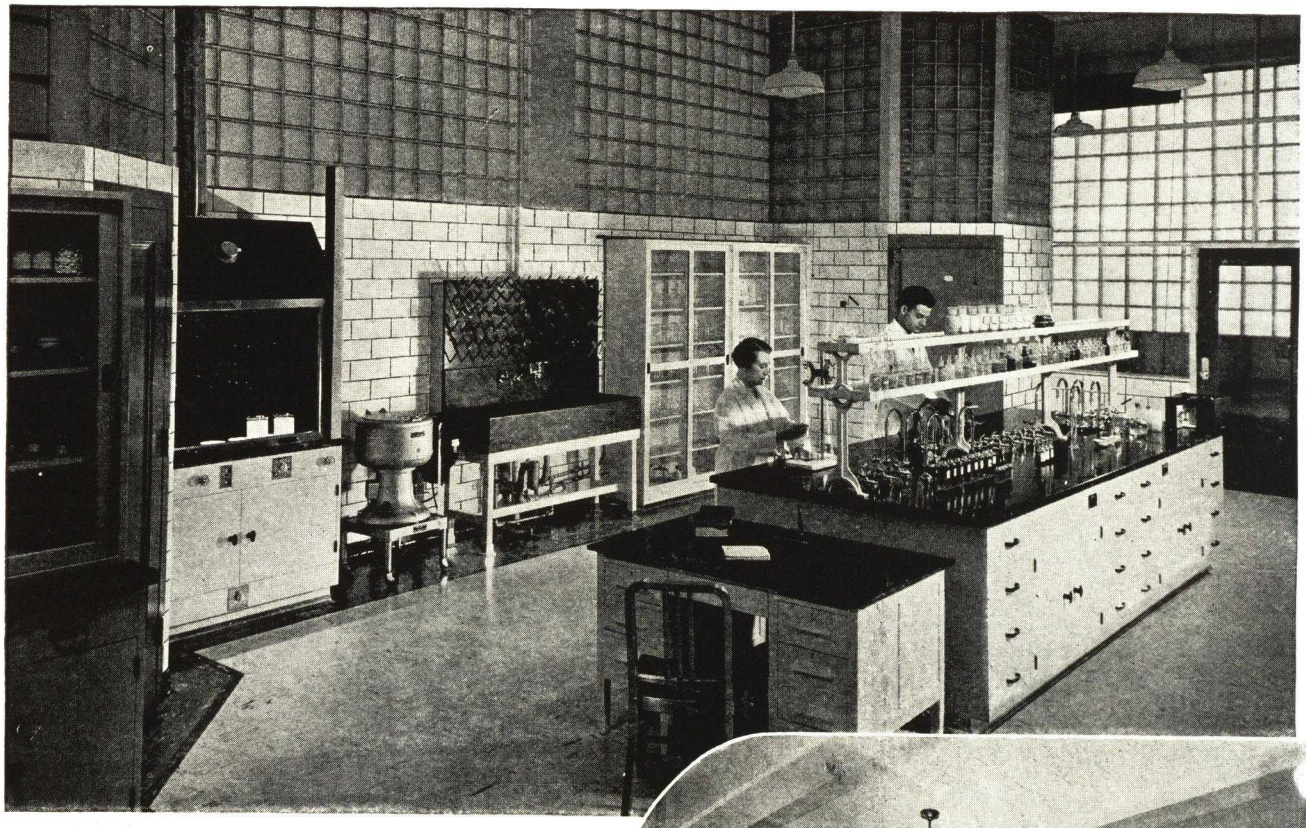
The ceramic glazes used are of the highest quality. They are high fired, that is, burned at temperatures of 1800 to 2000 degrees Fahrenheit. These glazes comprise attractive matt and glossy effects in solid colors as well as mottles. The salt glazes are furnished in mingled light shades. The mingled tones, in both the ceramic and salt glazes, produce wall surfaces with much more character than uninteresting, uniform shades.

These colors and shades will not fade. Life expectancy tests by the auto-clave method, accurately simulate the wear and tear of years of exposure. Applied to Natco Glazed Structural Facing Tile, they confirm what has already been proved in thousands of actual installations, that Natco Glazes positively will endure.

NATIONAL FIREPROOFING CORPORATION • Pittsburgh

50
YEARS
1889-1939

natco GLAZED



Natco Glazed Vitritile "V" Series in analytical laboratory of new toiletries plant of the Campana Sales Company, Batavia, Illinois. Gray and buff mottled tile used. Frank D. Chase and Childs & Smith, Associate Architects and Engineers, Pere Anderson & Company, Contractors, both of Chicago.

With walls of Natco Glazed Structural Facing Tile, there is an assurance of freedom from future maintenance, painting, plastering or repair bills. First cost is last cost.

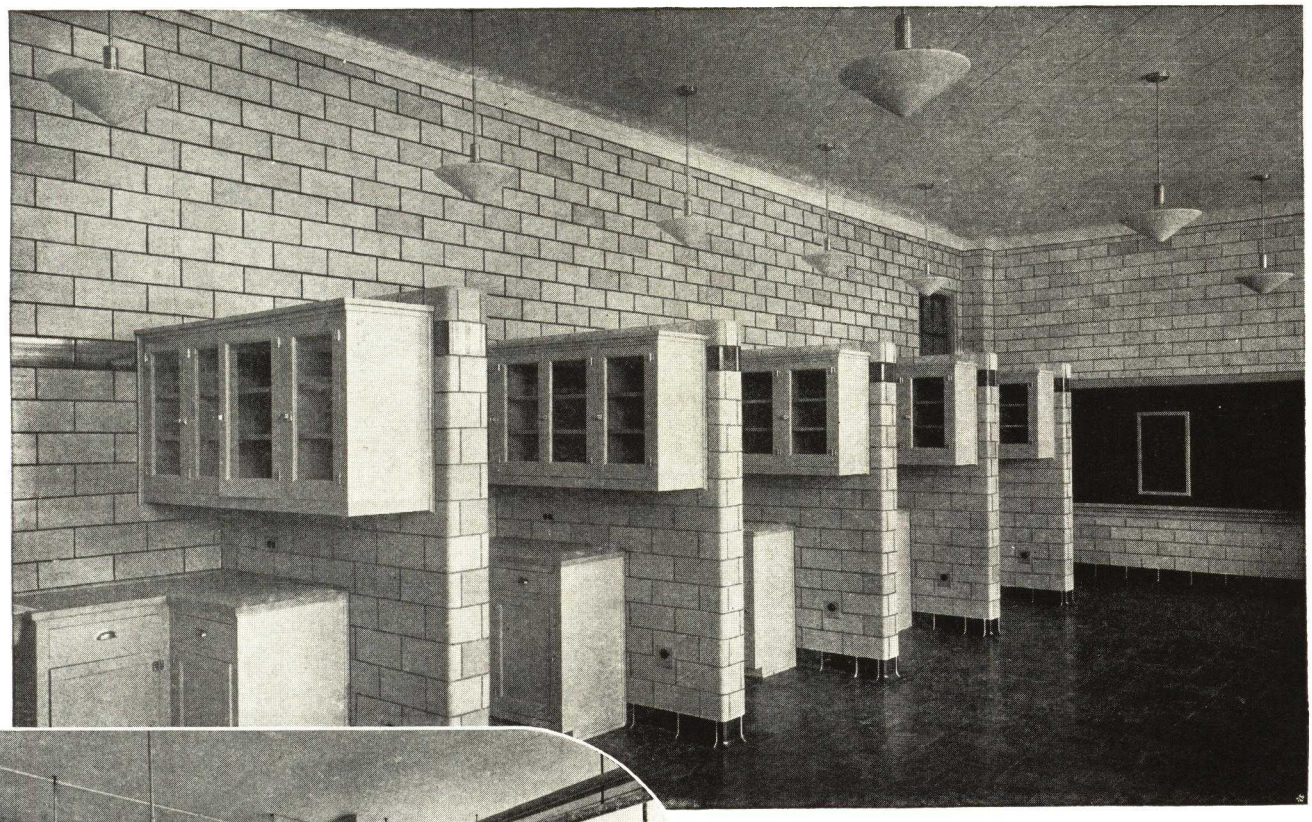
The glass-hard surfaces are easily cleaned and kept clean, are not affected by heat, cold dampness, grease or chemicals. It is these characteristics which make Natco Glazed Structural Facing Tile so satisfactory for walls of dairy, food product and similar buildings where cleanliness and attractiveness are so important.

Scientifically designed to offer maximum strength with minimum weight, Natco Glazed Structural Facing Tile are all true load-bearing units which effect savings in dead load, with consequent reductions in steel and foundation costs.

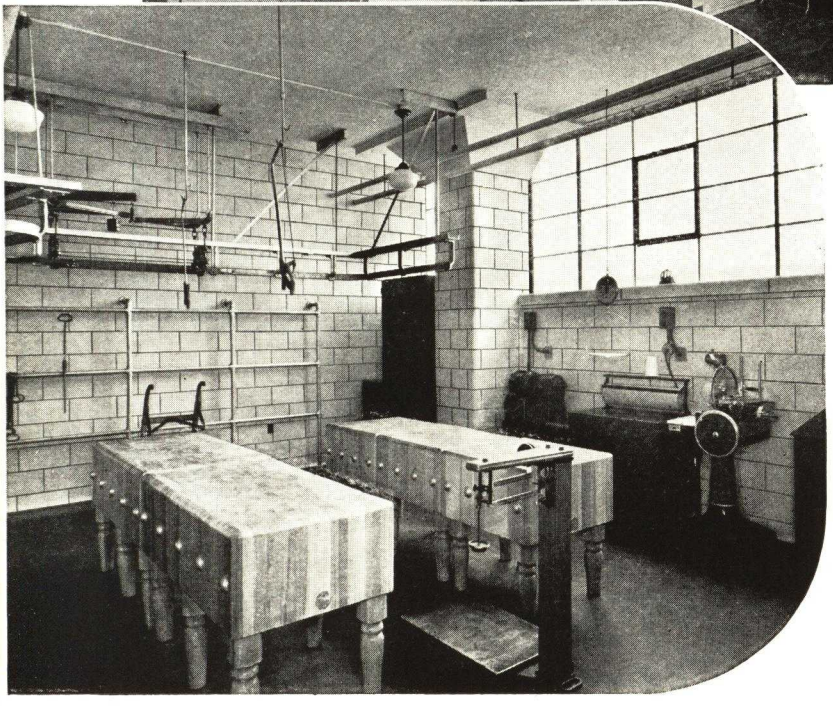
Natco Glazed Decorata Tile, "W" Series, in office of the Eloise Storage Warehouse, Eloise, Michigan. Light buff mottled tile used throughout. Nathaniel O. Gould, Architect, W. E. Wood Company, General Contractors.

50 Years of Service to the Building Industry

STRUCTURAL FACING TILE



Farm Security Administration School at Cahaba, Birmingham, Alabama. Natco Salt Glazed Light Vitritile used with dark chocolate base and belt course. Architect, D. H. Green, Birmingham, Alabama.



View of butcher shop in Eloise Storage Warehouse, Eloise, Michigan, where Natco Glazed Decorata Tile, "W" Series was used. Light buff mottled tile used throughout. Nathaniel O. Gould, Architect and W. E. Wood Company, General Contractors.

Proof against fire, the large comparatively light units are also quickly handled and laid.

With each tile laid a portion of the finished wall is put in place.

Used for veneering or furring purposes, Natco Glazed Structural Facing Tile has also proved its economy and enduring attractiveness in thousands of representative buildings throughout the country.

The double shell construction assures secure mortar joints—combined with the cellular construction, with its enclosed air spaces, resists the passage of heat, cold, sound and moisture going through the walls.

Estimates of the cost and quantities of Natco Glazed Structural Facing Tile will be gladly given on any project up now or contemplated in the future.

NATIONAL FIREPROOFING CORPORATION • Pittsburgh

NATCO • GLAZED STRUCTURAL FACING TILE

Unlimited possibilities as to interior treatments and color schemes are possible with Natco Glazed Structural Facing Tile in that there are so many colors in plain or mottled effects available. It provides a permanent and sanitary lining that will require no maintenance cost during the life of the building and the initial cost is no greater than many other materials that do not have the same sanitary and structural qualities.

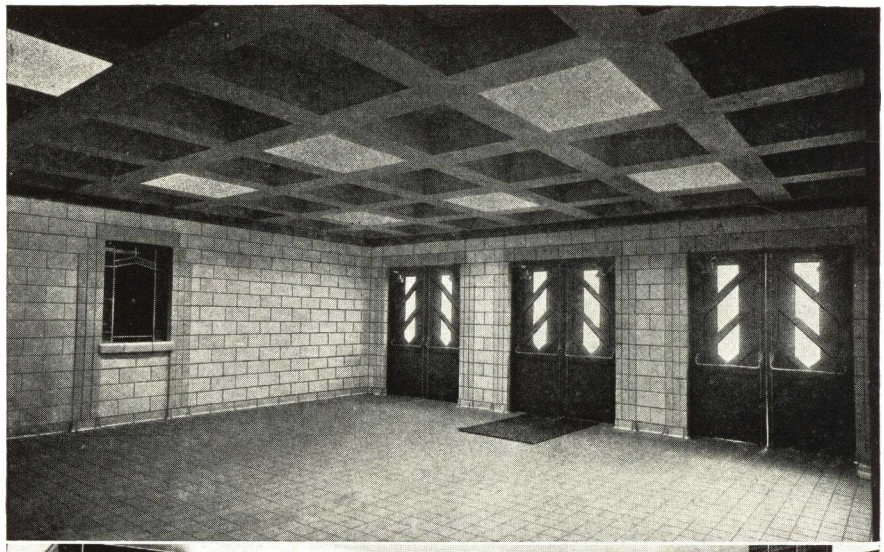
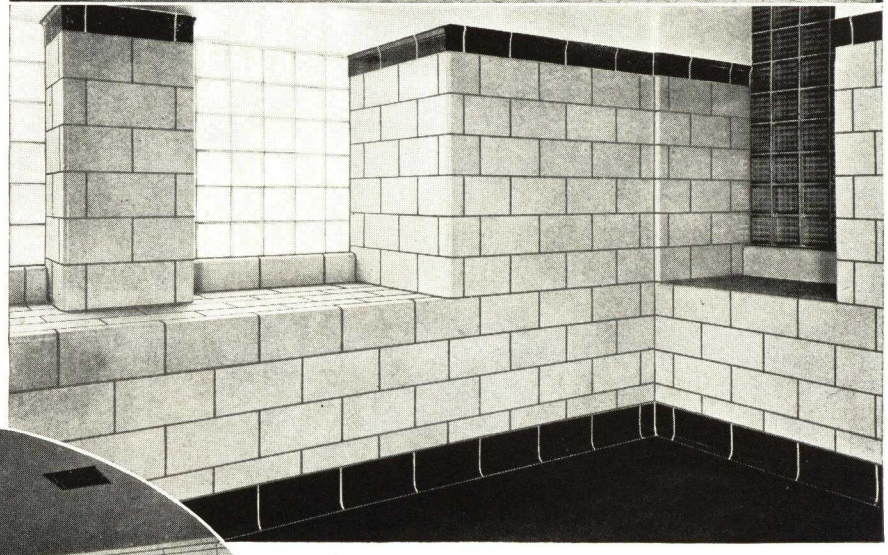
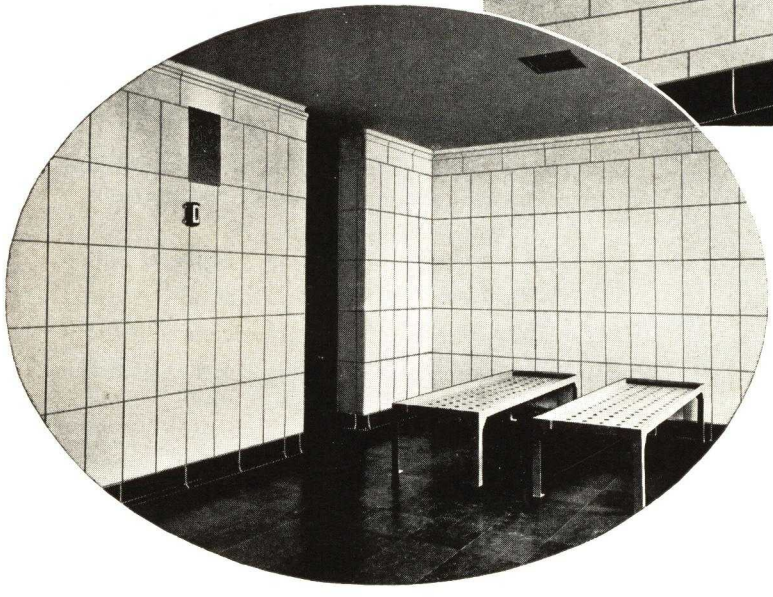


Illustration at top shows Natco Glazed Decorata Tile, "W" Series, in National Guard Armory, Rockford, Illinois; buff and green and gray and buff mottled tile was used. Harold Bradley, Architect, and Sjostrom & Sons, Contractors, both of Rockford, Illinois.



Immediately under is interior view of Avon Exchange Building, Cincinnati & Suburban Bell Telephone Building, Cincinnati, Ohio, showing Natco Glazed Decorata Tile, "W" Series; gray and buff mottled tile was used with a dark green tile for the base course.



Natco Glazed Decorata Tile, "W" Series, in Women's Detention Room of the Winnebago County Court House, Oshkosh, Wisconsin. Ivory and solid cream shades were used with a chocolate base. Granger & Bollenbacker, Architects and Lundoff-Bicknell Company, Contractors, both of Chicago.

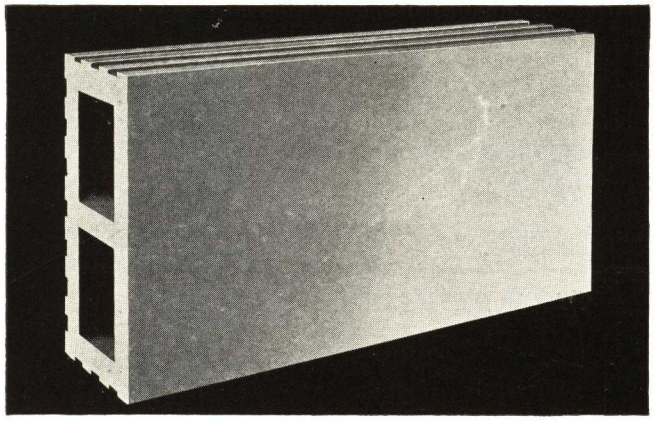
In the following pages, we show the comprehensive line of shapes available in every type of Natco Glazed Structural Facing Tile. They are the result of many years' experience in furnishing glazed ware and will adequately take care of practically all structural conditions encountered. To insure the most economical construction, as well as the most attractive appearance in the finished work, an electrical abrasive saw, either of the portable or table type is used to produce cuts as required. On any specific application, if desired, our Engineering Department will be pleased to co-operate in working out the most efficient and economical use of Natco Glazed Structural Facing Tile.

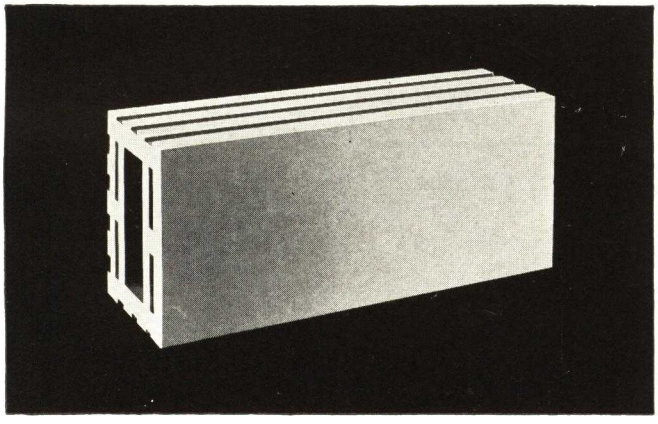
50 Years of Service to the Building Industry

Standard Stretcher Shapes—Natco Glazed Structural Facing Tile

NATCO
DECORATA

"W" Series—8x16¼-inch face (equivalent to 6 standard brick). Furnished in ceramic glazes only, for 3⅞-inch wall thickness; also 1¾-inch for furring. Natco Decorata "W" Series is furnished select one face only. See pages 8 and 9 for shape details.





★ ★ ★

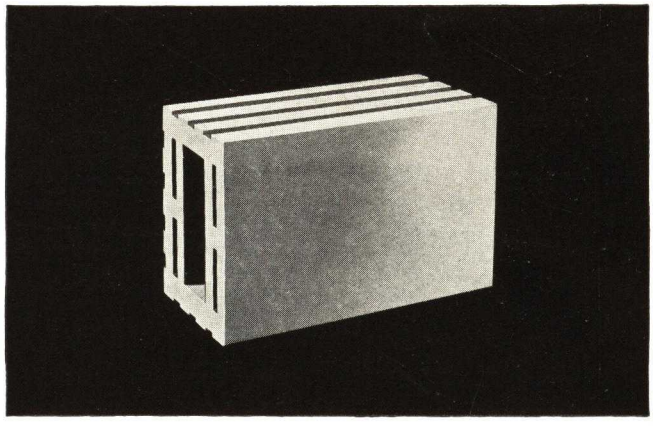
NATCO
VITRITILE

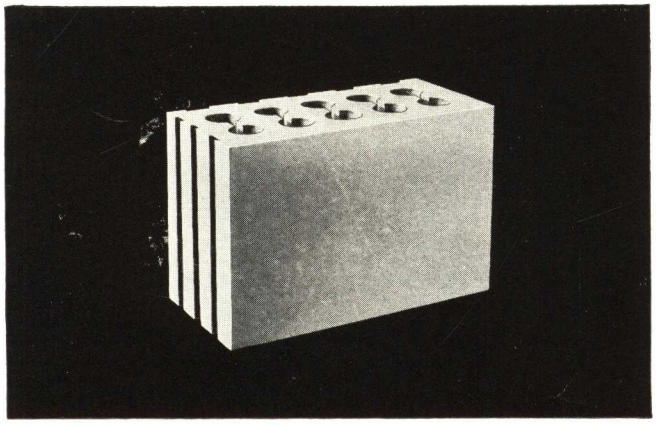
"T" Series—5x12-inch face (equivalent to 3 standard brick). Double shell construction. Furnished in ceramic and salt glazes. For 3⅞, 5⅞ and 8-inch wall thickness; also in 1¾-inch for furring. Usually furnished select one face; on special order can be supplied select two faces. See pages 10, 11 and 12 for shape details.

★ ★ ★

NATCO
DECORATA

"N" Series—5x8-inch face (equivalent to 2 standard brick). Double shell construction. Furnished in ceramic and salt glazes. For 3⅞, 5⅞ and 8-inch wall thickness; also in 1¾-inch for furring. Usually furnished select one face; on special order can be supplied select two faces. See pages 14 and 15 for shape details.





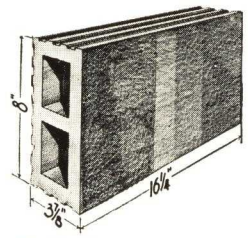
★ ★ ★

NATCO
VITRIBRIK

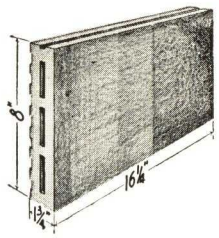
"D" Series—5x8-inch face (equivalent to 2 standard brick). Vertical construction. Furnished in ceramic and salt glazes. For 3⅞, 5⅞ and 8-inch wall thickness; also in 1¾-inch for furring. Usually furnished select one face; on special order can be supplied select two faces. See pages 16 and 17 for shape details.

SERIES "W" 8" x 16¼" FACE • • SIX and one-half BRICK EQUIVALENT UNITS

STRETCHER GROUP

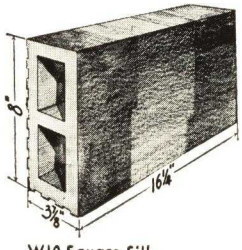


W Stretcher
W1 Same, Half

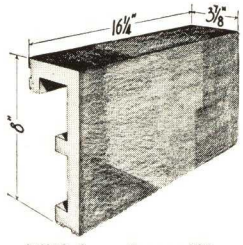


WA Soap Stretcher
W1A Same, Half

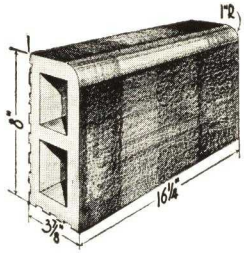
GROUP II SHAPES



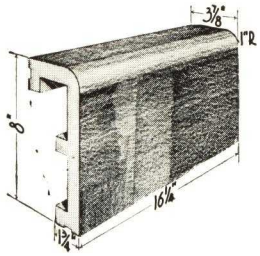
W10 Square Sill
W11 Same, Half



W10B Soap, Square Sill, 4" Reveal
W11B Same, Half
W10A Soap, Square Sill, 2" Reveal
W11A Same, Half

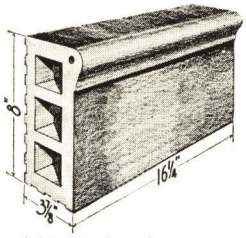


W20 Bullnose Sill
W21 Same, Half

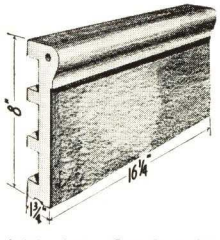


W20B Soap, Bn. Sill, 4" Rev.
W21B Same, Half
W20A Soap, Bn. Sill, 2" Rev.
W21A Same, Half

The above SILL SHAPES are popular for cap and coping.

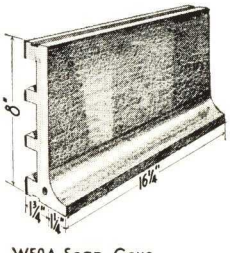


W40 Cap Stretcher
W41 Same, Half



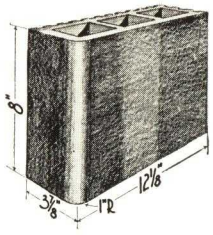
W40A Soap, Cap Stretcher
W41A Same, Half

W50 Cove Stretcher
W51 Same, Half

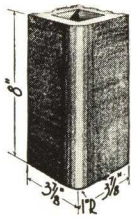


W50A Soap, Cove Stretcher
W51A Same, Half

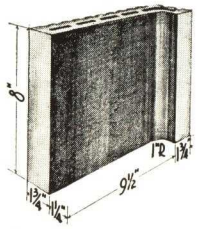
GROUP I SHAPES



WM4 Bullnose Jamb
WM2 Quoin (Square) Jamb

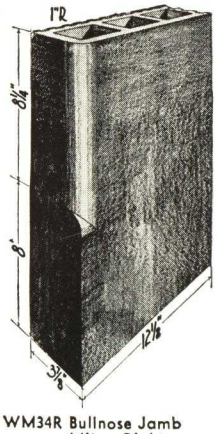


W4Q Bullnose Jamb, 4" Long
W2Q Quoin (Sq.) Jamb, 4" Long

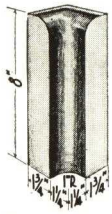


W8 Coved Internal Corner

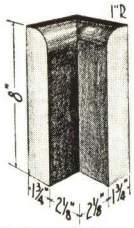
GROUP IV SHAPES



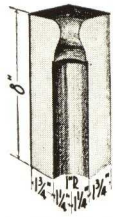
WM34R Bullnose Jamb Miter, Right
(Used with Slope Sills)



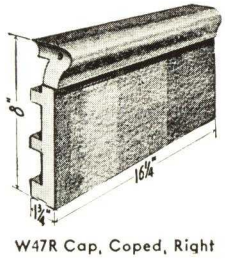
W28H Soap, Bullnose Sill Internal Coved Corner



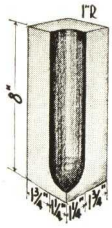
W27H Soap, Bullnose Sill, Internal Square Corner



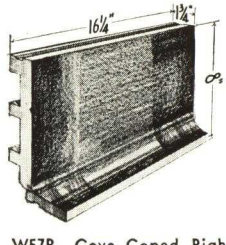
W48H Cap, Internal Coved Corner



W47R Cap, Coped, Right



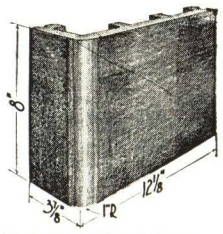
W58H Cove, Internal Coved Corner



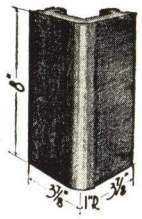
W57R Cove, Coped, Right
W57HR Same, Half

An extra charge is made for cutting lengths or heights other than those shown or listed.
An electrically driven saw should be used for all cutting on the job.

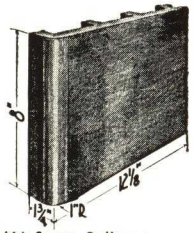
SERIES "W" 8" x 16¼" FACE • • SIX and one-half BRICK EQUIVALENT UNITS



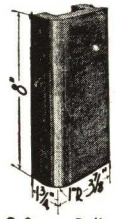
WM4B Soap, Bullnose Jamb 4" Return
WM2B Soap, Quoin (Sq.) Jamb, 4" Return



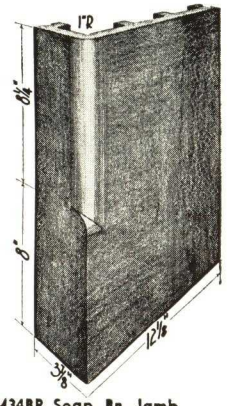
W4BQ Soap, Bullnose Jamb, 4" Return, 4" Long
W2BQ Soap, Quoin (Sq.) Jamb, 4" Return, 4" Long



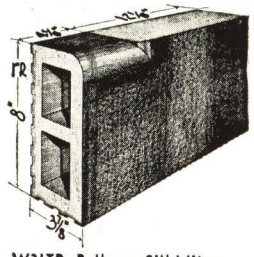
WM4A Soap, Bullnose Jamb, 2" Return
WM2A Soap, Quoin (Sq.) Jamb, 2" Return



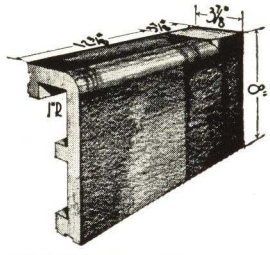
W4AQ Soap, Bullnose Jamb, 2" Return, 4" Long
W2AQ Soap, Quoin (Sq.) Jamb 2" Return, 4" Long



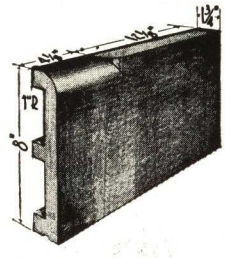
WM34BR Soap, Bn. Jamb Miter, Right, 4" Ret.
WM34AR Same, 2" Ret.



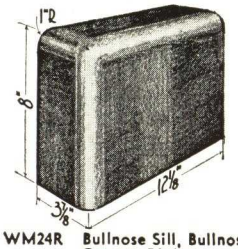
W31TR Bullnose Sill Miter, Right, 12" Jamb
W31QR Same, 4" Jamb



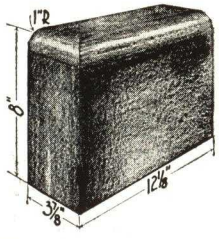
W31QBR Soap, Bullnose Sill Miter, Right 4" Jamb, 4" Rev.
W31TBR Same, 12" Jamb



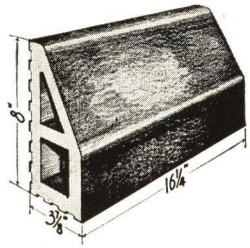
W31TAR Soap, Bullnose Sill Miter, Right, 12" Jamb, 2" Rev.
W31QAR Same, 4" Jamb



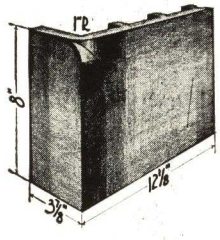
WM24R Bullnose Sill, Bullnose Corner, Right
WM24AR Same, Soap, 2" Ret.
W24HR Bullnose Sill, Bn. Corner, Right, 8" Long
W24AHR Same, Soap, 2" Ret.



WM22R Bullnose Sill, Square Corner, Right
WM22AR Same, Soap, 2" Ret.
W22HR Bullnose Sill, Square Corner, Right, 8" Long
W22AHR Same, Soap, 2" Ret.

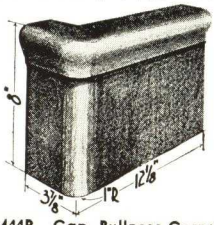


W260 Slope, Sill
W261 Same, Half

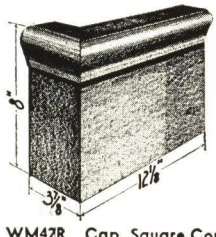


WM30BR Soap, Bullnose Miter, Right, 4" Return
WM30AR Same, 2" Return

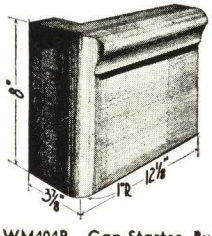
SILL SHAPES, shown above, are popular also as Cap and Coping Shapes



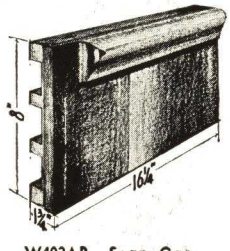
WM44R Cap, Bullnose Corner, Rt.
WM44AR Same, Soap, 2" Ret.
W44HR Cap, Bullnose Corner, Right, 8" Long
W44AHR Same, Soap, 2" Ret.



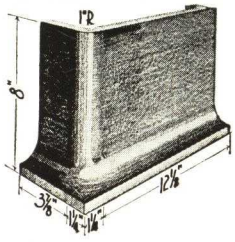
WM42R Cap, Square Corner, Rt.
WM42AR Same, Soap, 2" Ret.
W42HR Cap, Square Corner, Right, 8" Long
W42AHR Same, Soap, 2" Ret.



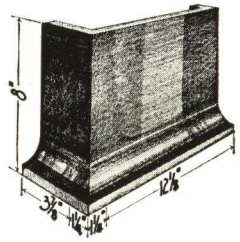
WM404R Cap Starter, Bullnose Rt.
WM404AR Same, Soap, 2" Ret.
W404HR Cap Starter, Bullnose Rt., 8" Long
W404AHR Same, Soap, 2" Ret.



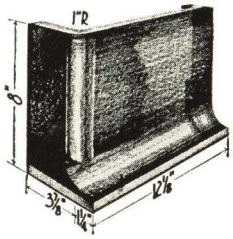
W402AR Soap, Cap Starter Quoin (Square), Right
W402AHR Same, Half



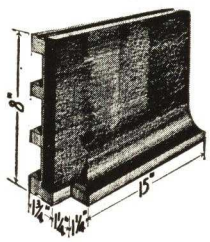
WM54R Cove, Bullnose, Right
WM54AR Same, Soap, 2" Return
W54HR Cove, Bullnose Right, 8" Long
W54AHR Same, Soap, 2" Ret.



WM52R Cove, Square Corner, Rt.
WM52AR Same, Soap, 2" Ret.
W52HR Cove, Square Corner, Right, 8" Long
W52AHR Same, Soap, 2" Ret.



WM504R Cove Starter, Bullnose, Rt.
WM504AR Same, Soap, 2" Ret.
W504HR Cove Starter, Bullnose, Right, 8" Long
W504AHR Same, Soap, 2" Ret.

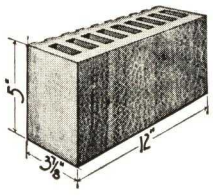


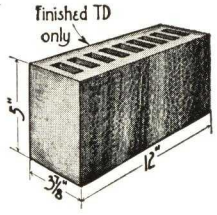
W502AR Soap, Cove Starter, Square Right
W502AHR Same, Half

Nominal dimensions are usually given for returns, lengths, etc.; 2" is actually 1¾", 4" is actually 3⅝" and 6" is actually 5⅝". For complete explanatory notes, see page 23.

SERIES "T" 5"x12" FACE • • THREE BRICK EQUIVALENT UNITS

STRETCHER GROUP

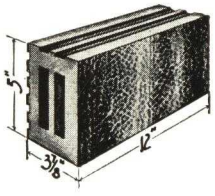


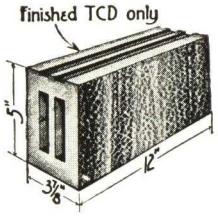


T-STRETCHERS

Tgr Stretcher, Scored Back

Tsm Stretcher, Smooth Back
TD Two Face Stretcher

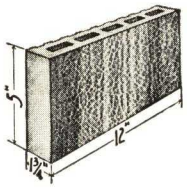




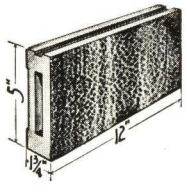
TC-STRETCHERS

TCgr Stretcher, Scored Back

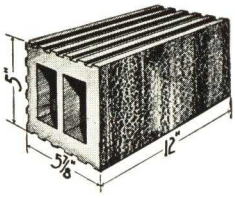
TCsm Stretcher, Smooth Back
TCD Two Face Stretcher



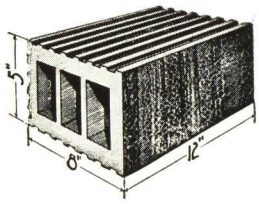
TA Soap Stretcher



TCA Soap Stretcher



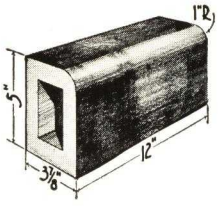
T60 6" Bond Stretcher



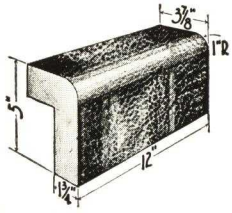
T80 8" Bond Stretcher
(Not furnished with Smooth Back or Two Face)

Unless job conditions require either SMOOTH or SCORED BACK STRETCHERS, shipment may be facilitated by ordering T-Stretchers, thereby permitting manufacturer to ship either the scored or smooth back stretchers or a mixture. Type and direction of SCORING and CORING are optional with each manufacturer. In general, each manufacturer standardizes on either the horizontal or vertical coring and does not supply both.

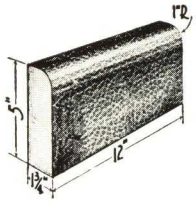
GROUP II SHAPES—Sill, Cap and Cove Stretchers



T20 Bullnose Sill
T10 Square Sill

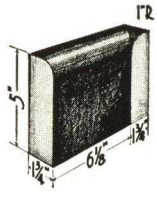


T20B Soap, Bullnose Sill, 4" Reveal

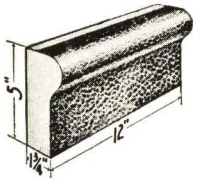


T20A Soap, Bullnose Sill 2" Reveal

GROUP IV SHAPES

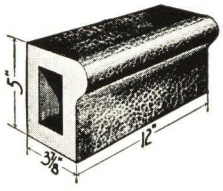


T27L Bullnose Sill, Internal Square Corner, Left

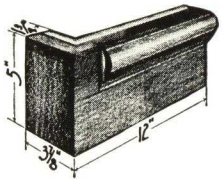


T40 Cap Stretcher
2" Reveal

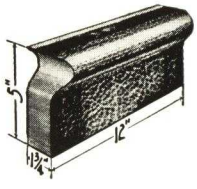
GROUP III SHAPES
Special Cap and Cove



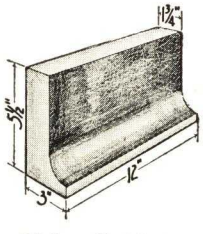
T40M Cap Stretcher, 4" Reveal



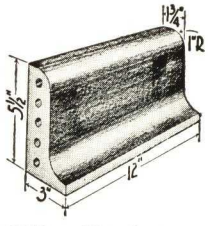
T402R Cap Starter, Quoin (Square) Corner, Right
T402AR Same, Soap, 2" Ret.



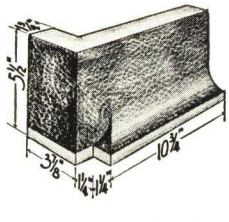
T47R Cap, Internal Coped, Right



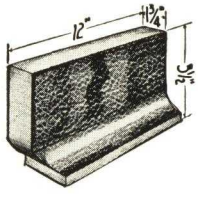
T50 Cove Stretcher



T520 Round Top Cove
(Corners and Starters furnished for this shape —Group V)



T502R Cove Starter, Quoin (Square) Corner, Right
T502AR Same, Soap, 2" Ret.

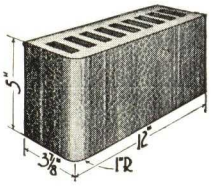


T57R Cove, Internal Coped Right

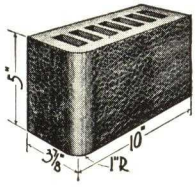
An extra charge is made for cutting lengths or heights other than those shown or listed.
An electrically driven saw should be used for all cutting on the job.

SERIES "T" 5"x12" FACE • • THREE BRICK EQUIVALENT UNITS

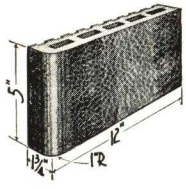
GROUP I SHAPES



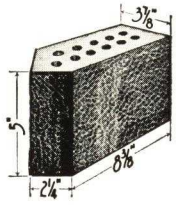
T4 Bullnose Jamb
T4H Same, Half
T2 Quoin (Square) Jamb
T2H Same, Half



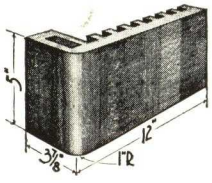
TG4 Bullnose Corner



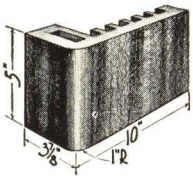
T4A Soap, Bullnose Jamb, 2" Return
T2A Soap, Quoin (Square) Jamb, 2" Return



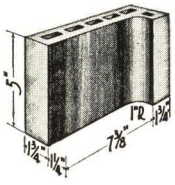
T6 External Octagon
T6A Same, Soap



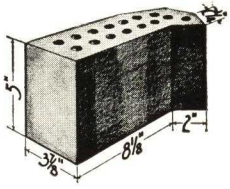
T4B Soap, Bullnose Jamb, 4" Return
T2B Soap, Quoin (Square) 4" Return



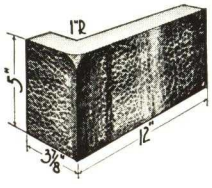
TG4B Soap, Bullnose Corner 4" Return



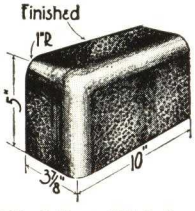
T8 Coved Internal Corner



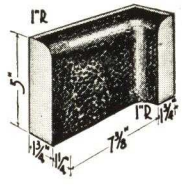
T9 Internal Octagon
T9A Same, Soap



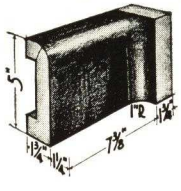
T204BR Soap, Bullnose Starter, Right (Used with Slope Sills)



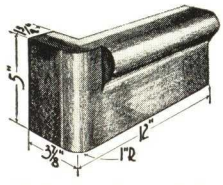
TG24R Bullnose Sill, Bullnose Corner, Right
TG24BR Same, Soap, 4" Return
T24HR Bullnose Sill, Bullnose Corner, Right, 6" Long
T22HR Bullnose Sill, Quoin (Sq.) Corner, Rt., 6" Long



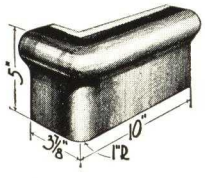
T28L Bullnose Sill, Coved Internal Corner, Left



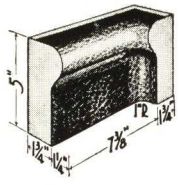
T208AL Soap, Bullnose Coping Starter, Left



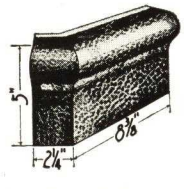
T404R Cap Starter, Bullnose Corner, Right
T404AR Same, Soap, 2" Return



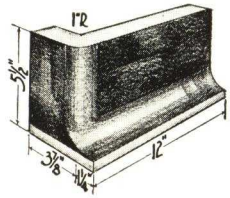
TG44R Cap, Bn. Corner, Rt.
T44HR Same, 6" Long
T42HR Cap, Quoin (Sq.) Corner, Right, 6" Long



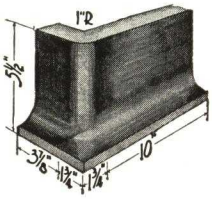
T48L Cap, Coved Internal Corner, Left



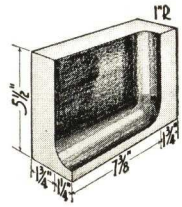
T46R Cap, External Octagon, Right
T49L Cap, Int. Octagon, Left. (For horizontal Dimensions see T59)



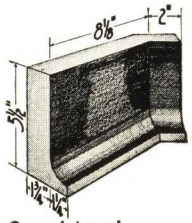
T504R Cove Starter, Bullnose, Right
T504AR Same, Soap, 2" Ret.



TG54R Cove, Bullnose Corner, Right
T54HR Same, 6" Long
T52HR Cove, Quoin (Sq.) Corner, Right 6" Long



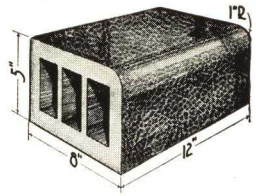
T58L Cove, Coved Internal Corner, Left



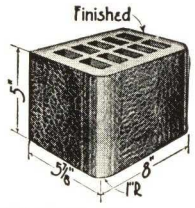
T59L Cove, Internal Octagon, Left
T56R Cove, External Octagon, Right
(For hor. dim. see T46)

Nominal dimensions are usually given for returns, reveals, lengths, etc.; 2" is actually 1¾", 4" is actually 3⅞" and 6" is actually 5⅞". For complete explanatory notes, see Page 23.

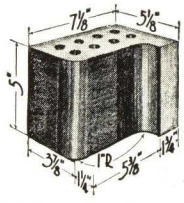
GROUP III SHAPES—Two Face Wall Ends, Copings and Specials



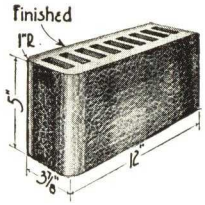
T820 Bullnose Sill, 8" Reveal
T810 Square Sill, 8" Reveal



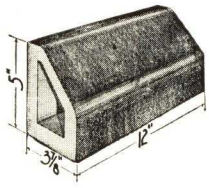
T85H Bullnose End, 8" Wall
T83H Quoin (Square) End, 8" Wall



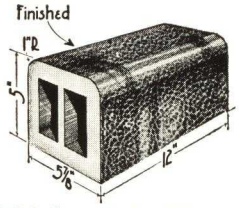
T38 Bullnose and Coved Corner
T38A Same, Soap, 2" Bullnose Return



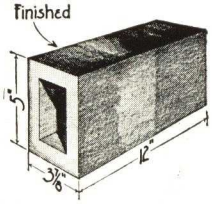
T5 Bullnose End, 4" Wall
T5H Same, Half
T3 Quoin (Sq.) End, 4" Wall



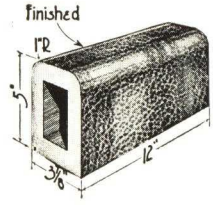
T260 Slope Sill



T620D Bullnose Coping, 6" Wall
T610D Square Coping, 6" Wall

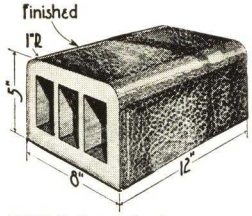


T10D Square Coping, 4" Wall

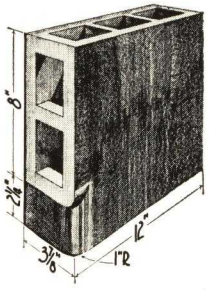


T20D Bullnose Coping, 4" Wall

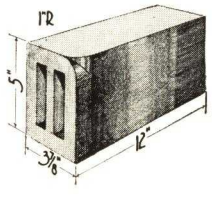
GROUP IV SHAPES



T820D Bullnose Coping, 8" Wall
T810D Square Coping, 8" Wall

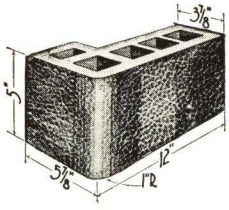


T34WR Bullnose Soldier Lintel Miter, Right
T34WAR Same, Soap, 2" Return

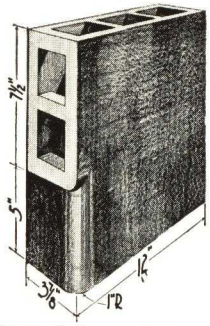


T30R Bullnose Miter, Right
T30AR Same, Soap, 2" Return

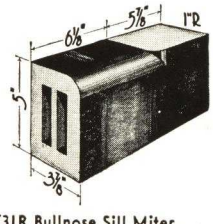
GROUP II SHAPES



T4N Bullnose Corner, 6" Return
T4E Same, Soap
T2N Square Corner, 6" Return
T2E Same, Soap

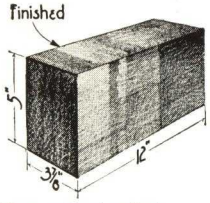


T34UR Bullnose Soldier Lintel, Universal Miter, Right
T34UAR Same, Soap, 2" Return

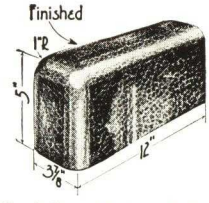


T31R Bullnose Sill Miter, Right

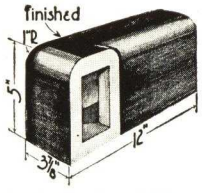
GROUP V SHAPES



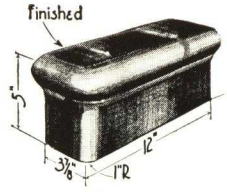
T13 Square Coping End, 4" Wall



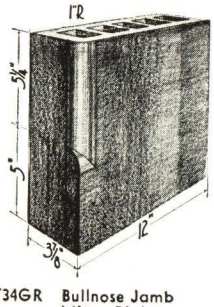
T25 Bullnose Coping, Bullnose End, 4" Wall
T25H Same, Half



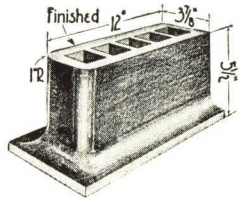
T207DR Bullnose Coping Corner, 4" Wall, Right



T45 Cap Coping, Bullnose End, 4" Wall
T45H Same, Half



T34GR Bullnose Jamb Miter, Right
(Used with slope sills)
T34GAR Same, Soap, 2" Return

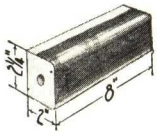


T55 Cove, Bullnose End 4" Wall
T55H Same, Half

An extra charge is made for cutting lengths or heights other than those shown or listed. An electrically driven saw should be used for all cutting on the job.

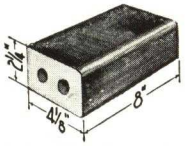
SERIES "S" 2¼" x 8" FACE • • ONE BRICK EQUIVALENT UNITS

GROUP II SHAPES



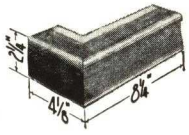
S40A Soap, Cap Stretcher, 2" Reveal

GROUP III SHAPES

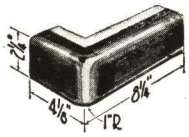


S40M Cap Stretcher, 4" Reveal

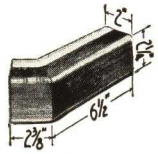
GROUP IV SHAPES—Handmade Fittings



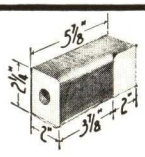
S42 Cap, Square Corner



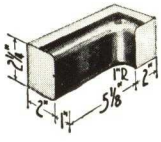
S44 Cap, Bullnose Corner



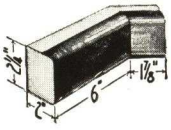
S46 Cap, External Octagon



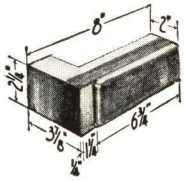
S47 Cap, Internal Square Corner



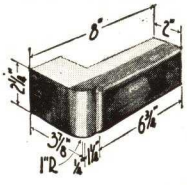
S48 Cap, Coved Internal Corner



S49 Cap, Internal Octagon



S402 Cap Starter Quoin (Square))Corner
S402A Same, Soap, 2" Return



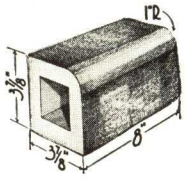
S404 Cap Starter, Bullnose Corner
S404A Same, Soap, 2" Return

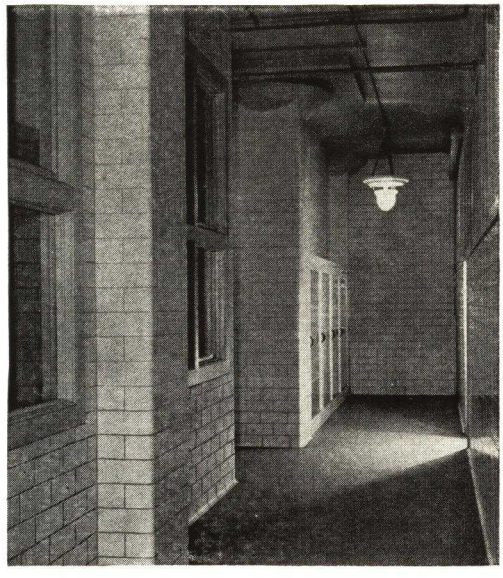
Above moulding in 2¼" height is also furnished in lengths to fit Series "T". When ordering, prefix the letter "T" to shape number. (Example: TS40A is a Soap, Cap Stretcher, 2" Reveal, 12" long.)

Flatter Series Shapes

This shape will generally be used as Lintels in connection with Bullnose Soldier Lintel Mitres, WT32V and WT34, etc.

F20 Flatter Bullnose Sill
F10 Flatter Square Sill
(Also used as Lintel and Corner Blocks)





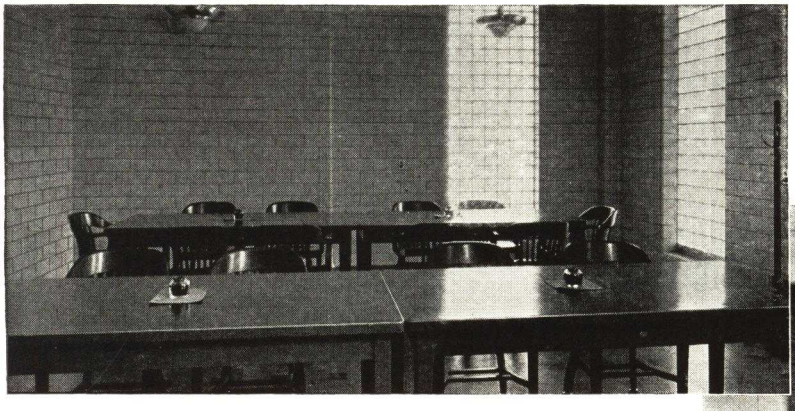
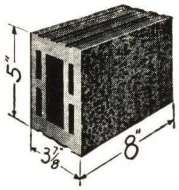


Illustration at upper right shows Natco Decorata Tile, "W" Series in the corridor of the Wayne County Building, Detroit. Nathaniel O. Gould, Architect and Engineer, Board of Wayne County Auditors, Russell Hunt, Supt., Contractors.

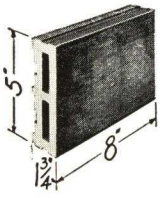
Pictures above and at right show office and corridor in Scranton Electric Company Building, Scranton, Pa. Natco Vitritile, "V" Series, was extensively used throughout. Davis & Lewis Architects, Breig Brothers, Contractors.

STRETCHER GROUP

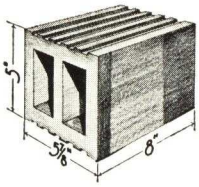


N Stretchers

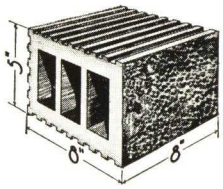
Ngr Stretcher, Scored Back Nsm Stretcher, Smooth Back
ND Two Face Stretcher



NA Soap Stretcher



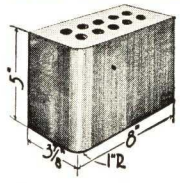
N60 6" Bond Stretcher



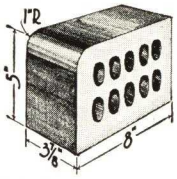
N80 8" Bond Stretcher

Unless job conditions require either SMOOTH or SCORED BACK STRETCHERS, shipment may be facilitated by ordering N-Stretchers, thereby permitting manufacturer to ship either the scored or smooth back stretchers or a mixture. Type and direction of SCORING and CORING are optional with each manufacturer. In general, each manufacturer standardizes on either the horizontal or vertical coring and does not supply both.

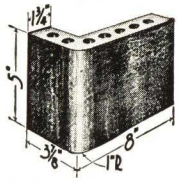
GROUP I SHAPES — Jambs, Corners and Octagons



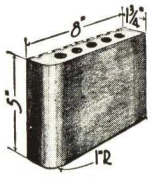
N4 Bullnose Jamb
N4H Same, Half
N2 Quoin (Square) Jamb
N2H Same, Half



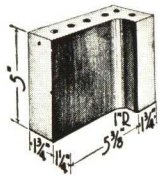
N821 Bullnose Sill Header
N811 Square Sill Header



N4B Soap, Bullnose Jamb, 4" Return
N2B Soap, Quoin (Sq.) Jamb, 4" Return

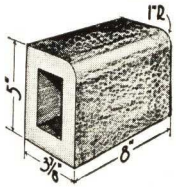


N4A Soap, Bullnose Jamb, 2" Return
N2A Soap, Quoin (Sq.) Jamb, 2" Return

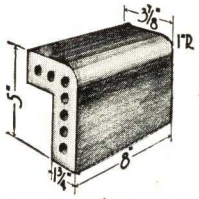


N8 Coved Internal Corner

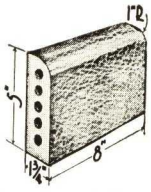
GROUP II SHAPES — Sill, Cap and Cove Stretchers



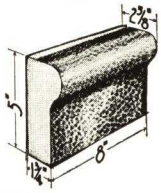
N20 Bullnose Sill, 4" Reveal
N10 Square Sill, 4" Reveal



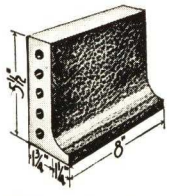
N20B Soap, Bullnose Sill, 4" Reveal
N10B Soap, Square Sill 4" Reveal



N20A Soap, Bullnose Sill, 2" Reveal
N10A Soap, Square Sill, 2" Reveal

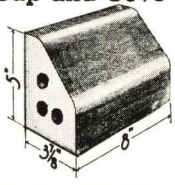


N40 Cap Stretcher, 2" Reveal

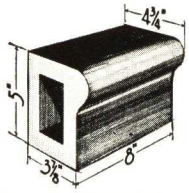


N50 Cove Stretcher

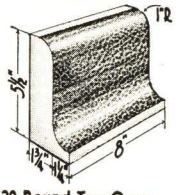
GROUP III SHAPES — Special Sill, Cap and Cove



N260 Slope Sill, 4" Reveal

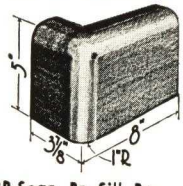


N40M Cap Stretcher, 4" Reveal

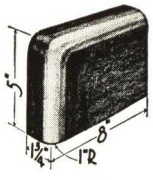


N520 Round Top Cove Stretcher
(Corners and Starters for this shape—Group V)

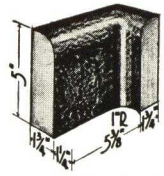
GROUP IV SHAPES



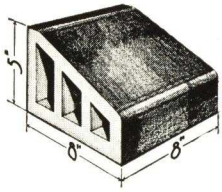
N24BR Soap, Bn. Sill, Bn. Corner, 4" Ret., Rt.
N22BR Soap, Bn. Sill Square Cor., 4" Ret., Rt.



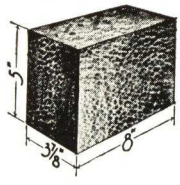
N24AR Soap, Bn. Sill Bn. Corner, 2" Ret., Rt.
N22AR Soap, Bn. Sill Square Cor., 2" Ret., Rt.



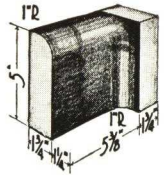
N28L Bullnose Sill, Coved Internal Corner, Left



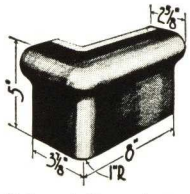
N8260 Slope Sill, 8" Reveal
N6260 Slope Sill, 6" Reveal



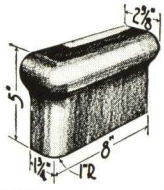
N12R Square Sill Quoin, Right



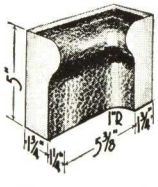
N208AL Soap, Bullnose Coping Starter, Left



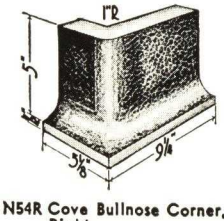
N44R Cap, Bullnose Corner, Right
N42R Cap, Square Corner, Right



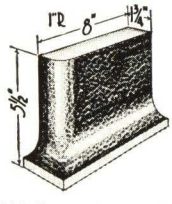
N44AR Soap Cap, Bn. Corner, 2" Return, Rt.
N42AR Soap Cap, Square Corner, 2" Ret., Rt.



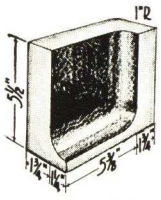
N48L Cap, Coved Internal Corner, Left



N54R Cove Bullnose Corner, Right
N52R Cove Quoin (Sq.) Corner, Right



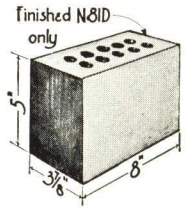
N54AR Soap, Cove Bullnose Corner, Right
N52AR Soap, Cove Quoin (Square) Corner, Right



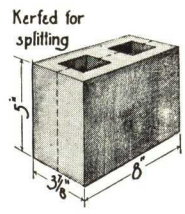
N58L Cove, Coved Internal Corner, Left

An extra charge is made for cutting lengths or heights other than those shown or listed.
An electrically driven saw should be used for all cutting on the job.

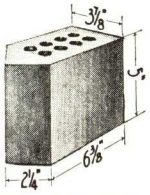
SERIES "N" 5" x 8" FACE • • TWO BRICK EQUIVALENT UNITS



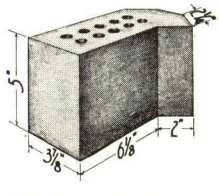
N81 Header
N81D Two Face Header



NV Kerfed Conduit Stretcher



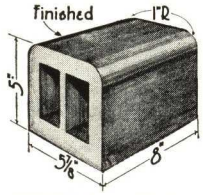
N6 External Octagon
N6A Same, Soap



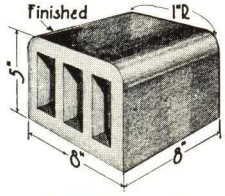
N9 Internal Octagon
N9A Same, Soap

GROUP III SHAPES

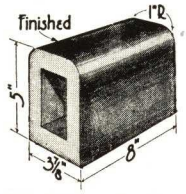
Copings and Two Face Wall Ends



N620D Bullnose Coping, 6" Wall
N610D Square Coping, 6" Wall

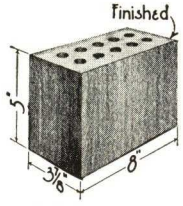


N820D Bullnose Coping, 8" Wall

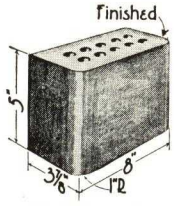


N20D Bullnose Coping, 4" Wall
N10D Square Coping, 4" Wall

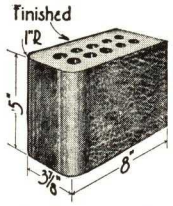
Above Shapes Also Used As Lintels



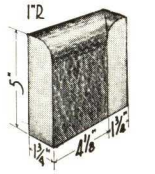
N83H Quoin (Square) End, 8" Wall



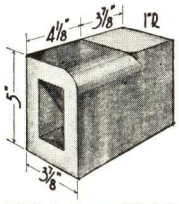
N85H Bullnose End, 8" Wall



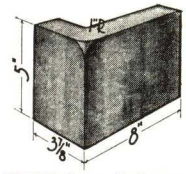
N5 Bn. End, 4" Wall
N5H Same, Half
N3 Quoin (Square) End, 4" Wall
N3H Same, Half



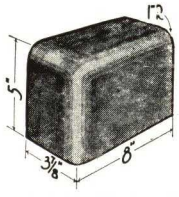
N27L Bullnose Sill, Internal Square Corner, Left



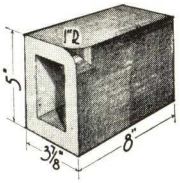
N31R Bullnose Sill Miter, Right



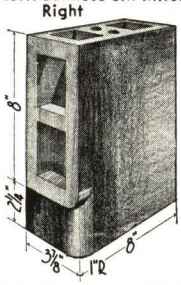
N204BR Soap. Bullnose Starter, 4" Return, Right (Use with slope sills)
N204AR Same, 2" Return



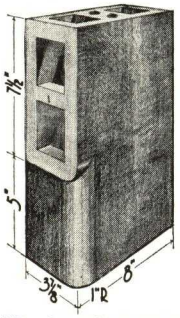
N24R Bullnose Sill, Bullnose Corner, Right
N22R Bullnose Sill, Quoin (Sq.) Corner, Rt.



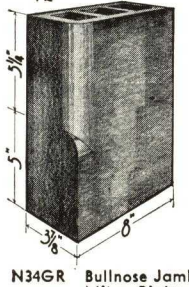
N30R Bullnose Miter, Right
N30AR Same, Soap



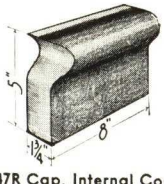
N34WR Bullnose Soldier Lintel Miter, Right
N34WAR Same, Soap 2" Return



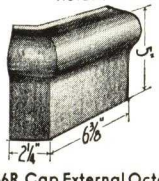
N34UR Bn. Soldier Lintel Universal Miter, Right
N34UAR Same, Soap, 2" Return



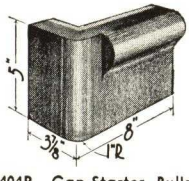
N34GR Bullnose Jamb Miter, Right (Used with slope sills)
N34GAR Same, Soap, 2" Return



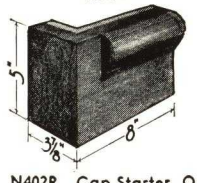
N47R Cap, Internal Coped, Right



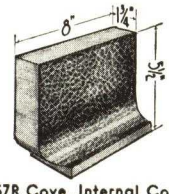
N46R Cap External Octagon, Right
N49L Cap Internal Octagon, Left (For Hor. Dim. see N59L)



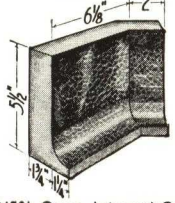
N404R Cap Starter, Bullnose, Right
N404AR Same, Soap, 2" Return



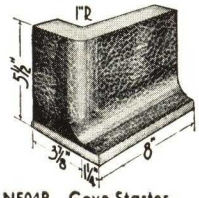
N402R Cap Starter, Quoin (Square) Right
N402AR Same, Soap, 2" Return



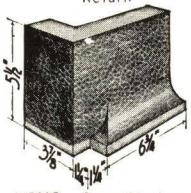
N57R Cove, Internal Coped, Right



N59L Cove, Internal Octagon, Left
N56R Cove External Octagon, Right (For Hor Dim. see D46R)

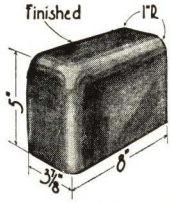


N504R Cove Starter, Bullnose, Right
N504AR Same, Soap, 2" Return

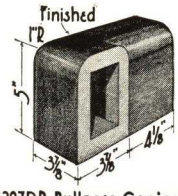


N502R Cove Starter, Quoin (Sq.) Right
N502AR Same, Soap, 2" Ret.

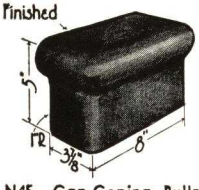
GROUP V SHAPES



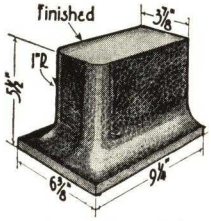
N25 Coping Bullnose End, 4" Wall
N25H Same, Half
N13 Square Coping End



N207DR Bullnose Coping Corner, 4" Wall, Right



N45 Cap Coping, Bullnose End, 4" Wall
N45H Same, Half

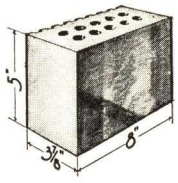


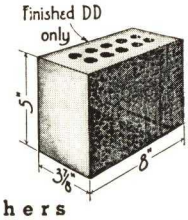
N55 Cove Bullnose End, 4" Wall

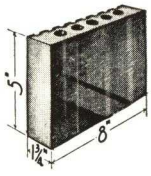
Nominal dimensions are usually given for returns, reveals, lengths, etc.; 2" is actually 1¾", 4" is actually 3⅞" and 6" is actually 5⅞".

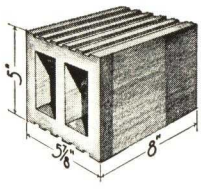
SERIES "D" 5"x8" FACE • • TWO BRICK EQUIVALENT UNITS

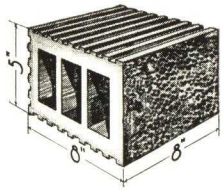
STRETCHER GROUP











D Stretchers

Dgr Stretcher, Scored Back

Dsm Stretcher, Smooth Back
DD Two Face Stretcher

DA Soap Stretcher

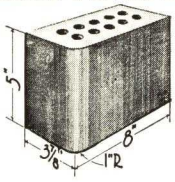
D60 6" Bond Stretcher

D80 8" Bond Stretcher

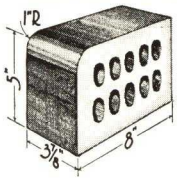
Unless job conditions require either SMOOTH or SCORED BACK STRETCHERS, shipment may be facilitated by ordering D-Stretchers, thereby permitting manufacturer to ship either the scored or smooth back stretchers or a mixture. Type and direction of SCORING and CORING are optional with each manufacturer. In general, each manufacturer standardizes on either the horizontal or vertical coring and does not supply both.

GROUP I SHAPES

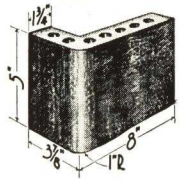
Jambs, Corners and Octagons



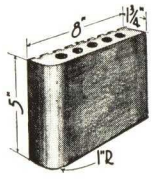
D4 Bullnose Jamb
D4H Same, Half
D2 Quoin (Square) Jamb
D2H Same, Half



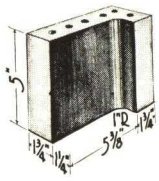
D821 Bullnose Sill Header
D811 Square Sill Header



D4B Soap, Bullnose Jamb, 4" Return
D2B Soap, Quoin (Sq.) Jamb, 4" Return



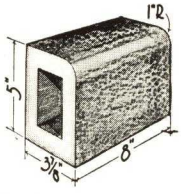
D4A Soap, Bullnose Jamb, 2" Return
D2A Soap, Quoin (Sq.) Jamb, 2" Return



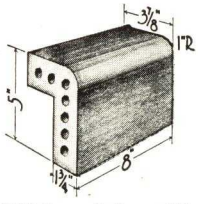
D8 Coved Internal Corner

GROUP II SHAPES

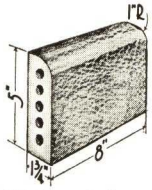
Sill, Cap and Cove Stretchers



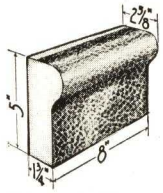
D20 Bullnose Sill, 4" Reveal
D10 Square Sill, 4" Reveal



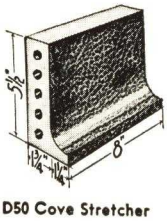
D20B Soap, Bullnose Sill, 4" Reveal
D10B Soap, Square Sill 4" Reveal



D20A Soap, Bullnose Sill, 2" Reveal
D10A Soap, Square Sill, 2" Reveal



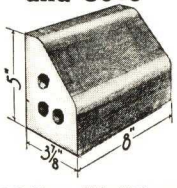
D40 Cap Stretcher 2" Reveal



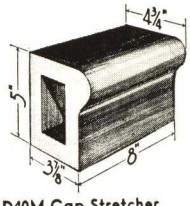
D50 Cove Stretcher

GROUP III SHAPES

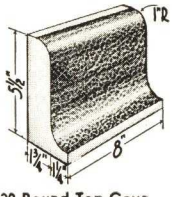
Special Sill, Cap and Cove



D260 Slope Sill, 4" Reveal

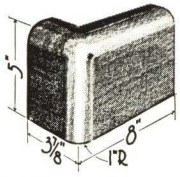


D40M Cap Stretcher, 4" Reveal

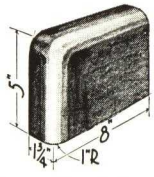


D520 Round Top Cove Stretcher
(Corners and Starters for this shape—Group V)

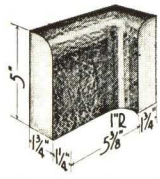
GROUP IV SHAPES



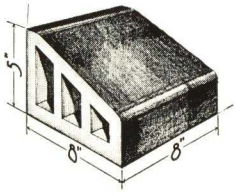
D24BR Soap, Bn. Sill Bn. Corner, 4" Ret., Rt.
D22BR Soap, Bn. Sill Square Cor., 4" Ret., Rt.



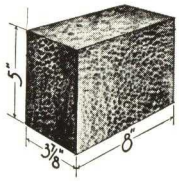
D24AR Soap, Bn. Sill Bn. Corner, 2" Ret., Rt.
D22AR Soap, Bn. Sill Square Cor., 2" Ret., Rt.



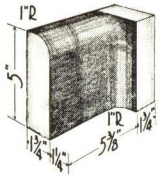
D28L Bullnose Sill, Coved Internal Corner, Left



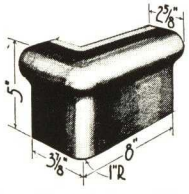
D8260 Slope Sill, 8" Reveal
D6260 Slope Sill, 6" Reveal



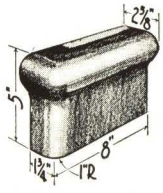
D12R Square Sill Quoin, Right



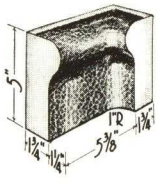
D208AL Soap, Bullnose Coping Starter, Left



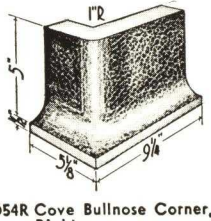
D44R Cap, Bullnose Corner, Right
D42R Cap, Square Corner, Right



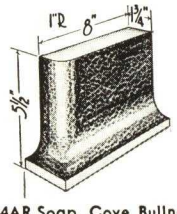
D44AR Soap Cap, Bn. Corner, 2" Return, Rt.
D42AR Soap Cap, Square Corner, 2" Ret. Right



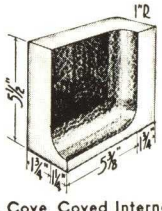
D48L Cap, Coved Internal Corner, Left



D54R Cove Bullnose Corner, Right
D52R Cove Quoin (Sq.) Corner, Right



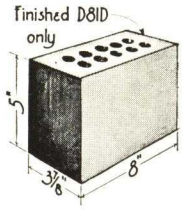
D54AR Soap, Cove Bullnose Corner, Right
D52AR Soap, Cove Quoin (Square) Corner, Right



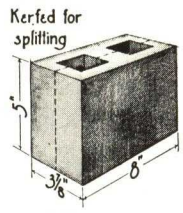
D58L Cove, Coved Internal Corner, Left

An extra charge is made for cutting lengths or heights other than those shown or listed.
An electrically driven saw should be used for all cutting on the job.

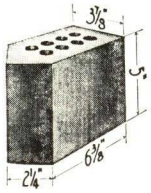
SERIES "D" 5"x8" FACE • • TWO BRICK EQUIVALENT UNITS



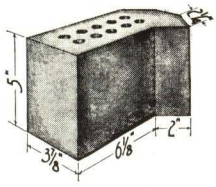
D81 Header
D81D Two Face Header



DV Kerfed Conduit Stretcher



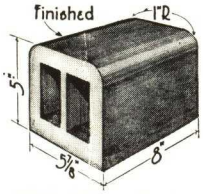
D6 External Octagon
D6A Same, Soap



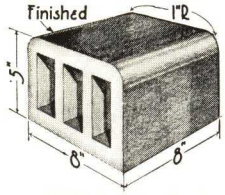
D9 Internal Octagon
D9A Same, Soap

GROUP III SHAPES

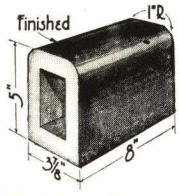
Copings and Two Face Wall Ends



D620D Bullnose Coping, 6" Wall
D610D Square Coping, 6" Wall

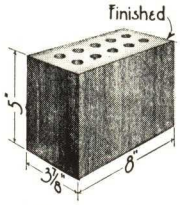


D820D Bullnose Coping, 8" Wall

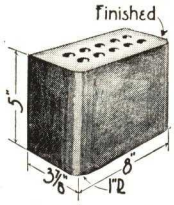


D20D Bullnose Coping, 4" Wall
D10D Square Coping, 4" Wall

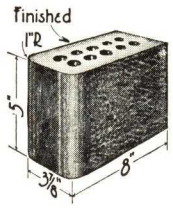
Above Shapes Also Used As Lintels



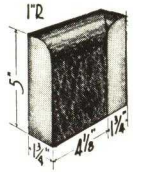
D83H Quoin (Square) End, 8" Wall



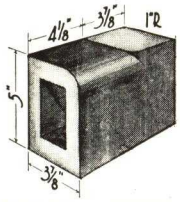
D85H Bullnose End, 8" Wall



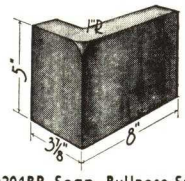
D5 Bn. End, 4" Wall
D5H Same, Half
D3 Quoin (Square) End, 4" Wall
D3H Same, Half



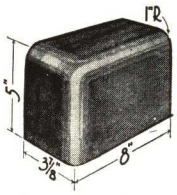
D27L Bullnose Sill, Internal Square Corner, Left



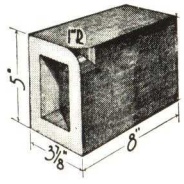
D31R Bullnose Sill Miter, Right



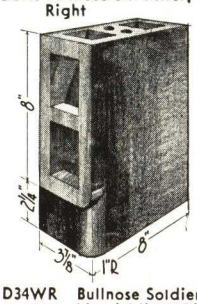
D204BR Soap, Bullnose Starter, 4" Ret., Right
(Used with slope sills)
D204AR Same, 2" Return



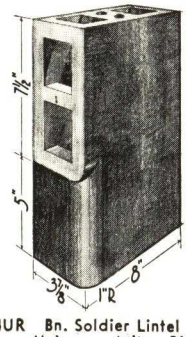
D24R Bullnose Sill, Bullnose Corner, Right
D22R Bullnose Sill, Quoin (Sq.) Corner, Rt.



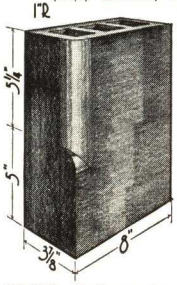
D30R Bullnose Miter, Right
D30AR Same, Soap



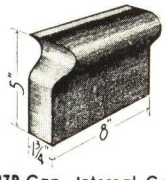
D34WR Bullnose Soldier Lintel Miter, Right
D34WAR Same, Soap 2" Return



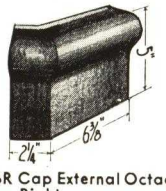
D34UR Bn. Soldier Lintel Universal Miter, Right
D34URA Same, Soap, 2" Return



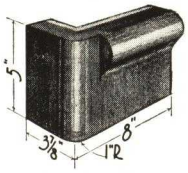
D34GR Bullnose Jamb Miter, Right
(Used with slope sills)
D34GAR Same, Soap, 2" Return



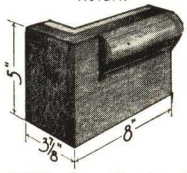
D47R Cap, Internal Coped, Right



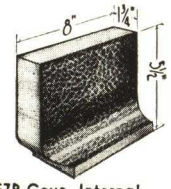
D46R Cap External Octagon, Right
D49L Cap Internal Octagon, Left (For Hor. Dim. see D59L)



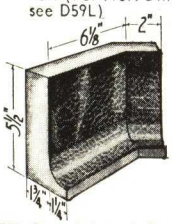
D404R Cap Starter, Bullnose, Right
D404AR Same, Soap, 2" Return



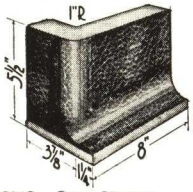
D402R Cap Starter, Quoin (Square) Right
D402AR Same, Soap, 2" Return



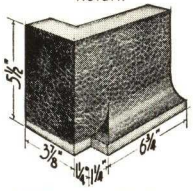
D57R Cove, Internal Coped, Right



D59L Cove Internal Octagon, Left
D56R Cove External Octagon, Right (For Hor. Dim. see D46R)

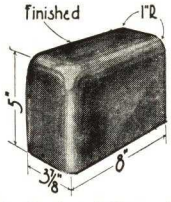


D504R Cove Starter, Bullnose, Right
D504AR Same, Soap, 2" Return

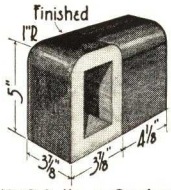


D502R Cove Starter, Quoin (Sq.), Right
D502AR Same, Soap, 2" Ret.

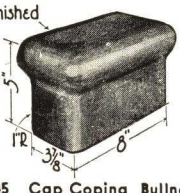
GROUP V SHAPES



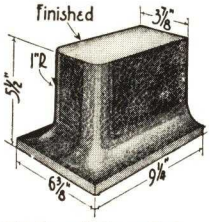
D25 Coping Bullnose End, 4" Wall
D25H Same, Half
D13 Square Coping End



D207DR Bullnose Coping Corner, 4" Wall, Right
D45H Same, half



D45 Cap Coping, Bullnose End, 4" Wall
D45H Same, Half



D55 Cove Bullnose End, 4" Wall

Nominal dimensions are usually given for returns, reveals, lengths, etc.; 2" is actually 1¾" 4" is actually 3⅞" and 6" is actually 5⅞". For complete explanatory notes see Page 23.

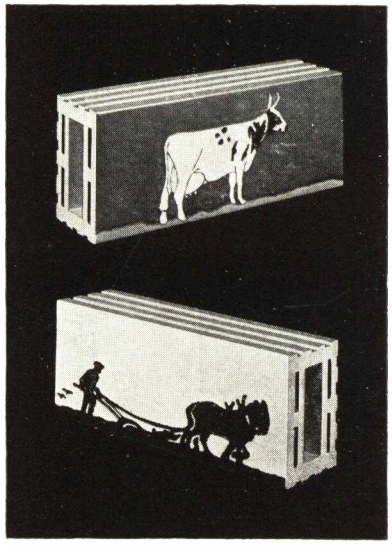
SELECT FROM A WIDE RANGE OF PERMANENT COLORS

The ceramic glazes in which Natco Glazed Structural Facing Tile are furnished come under two primary classifications: (1) Glossy or Lustrous Finish, which is bright and image-reflecting, and (2) Matt Finish, which is non-reflecting. For the field, in either matt or glossy finish, solid colors are available in white, ivory, tan, gray and cream. The mottles are available in gray-tan, cream-brown, cream-green, buff-green, brown-cream, white-gray, gray-buff and similar combinations of light colors. Also certain attractive mottles can be obtained in a glossy finish. Solid trim colors are furnished in light and dark brown, light and dark green, navy blue and black. These are all tested and standardized Natco finishes. New finishes and color effects are being developed and added to the Natco line from time to time in keeping with latest architectural trends. Special finishes or color combinations, however, will be made to order, by special agreement, if ample time is allowed for their development.

In the Salt Glazed Tile, Natco Litewall is supplied in a new pleasing range of extremely light buff shades.

Nacto Inserts

Decorative tile inserts that illustrate trade marks or certain other individual designs, characteristic of the particular project, add greatly to the appearance and general scheme of the finished wall. Typical Glazed Tile inserts made from sketches and drawings submitted to us, are illustrated to show the craftsmanship and general artistic treatment employed in their execution. Natco Glazed Tile inserts are all hand-made and are furnished on special order.



TABLES FOR DETERMINING HEIGHTS AND LENGTHS OF WALLS

These tables have been prepared as a ready reference and will be found very helpful. The height tables determine the heights of walls from the finished floor line which will best lay up without cutting tile. When cove base is used, be sure to provide for height of cove base course. The length tables show the length of walls and pilasters which will best lay up without cutting tile. To find width of openings, add two mortar joints or ½ in. to each dimension given.

HEIGHT TABLE

Course Number	5″ Heights ¼″ Joints	8″ Heights ¼″ Joints
1	5¼″	8¼″
2	10½″	1′ 4½″
3	1′ 3¾″	2′ 0¾″
4	1′ 9″	2′ 9″
5	2′ 2¼″	3′ 5¼″
6	2′ 7½″	4′ 1½″
7	3′ 0¾″	4′ 9¾″
8	3′ 6″	5′ 6″
9	3′ 11¼″	6′ 2¼″
10	4′ 4½″	6′ 10½″
11	4′ 9¾″	7′ 8¾″
12	5′ 3″	8′ 3″
13	5′ 8¼″	8′ 11¼″
14	6′ 1½″	9′ 7½″
15	6′ 6¾″	10′ 3¾″
16	7′ 0″	11′ 0″
17	7′ 5¼″	11′ 8¼″
18	7′ 10½″	12′ 4½″
19	8′ 3¾″	13′ 0¾″
20	8′ 9″	13′ 9″
21	9′ 2¼″	14′ 5¼″
22	9′ 7½″	15′ 1½″
23	10′ 0¾″	15′ 9¾″
24	10′ 6″	16′ 6″
25	10′ 11¼″	17′ 2¼″
26	11′ 4½″	17′ 10½″
27	11′ 9¾″	18′ 6¾″
28	12′ 3″	19′ 3″
29	12′ 8¼″	19′ 11¼″
30	13′ 1½″	20′ 7½″

LENGTH TABLE

Number of Tile	8″ Lengths ¼″ Joints	12″ Lengths ¼″ Joints	16¼″ Lengths ¼″ Joints
1	8″	1′ 0″	1′ 4¼″
1½	1′ 0⅛″	1′ 6⅛″	2′ 0½″
2	1′ 4¼″	2′ 0¼″	2′ 8¾″
2½	1′ 8⅜″	2′ 6⅜″	3′ 5″
3	2′ 0½″	3′ 0½″	4′ 1¼″
3½	2′ 4⅝″	3′ 6⅝″	4′ 9½″
4	2′ 8¾″	4′ 0¾″	5′ 5¾″
4½	3′ 0⅞″	4′ 6⅞″	6′ 2″
5	3′ 5″	5′ 1″	6′ 10¼″
5½	3′ 9⅛″	5′ 7⅛″	7′ 6½″
6	4′ 1¼″	6′ 1¼″	8′ 2¾″
6½	4′ 5⅜″	6′ 7⅜″	8′ 11″
7	4′ 9½″	7′ 1½″	9′ 7¼″
7½	5′ 1⅝″	7′ 7⅝″	10′ 3½″
8	5′ 5¾″	8′ 1¾″	10′ 11¾″
8½	5′ 9⅞″	8′ 7⅞″	11′ 8″
9	6′ 2″	9′ 2″	12′ 4¼″
9½	6′ 6⅛″	9′ 8⅛″	13′ 0½″
10	6′ 10¼″	10′ 2¼″	13′ 8¾″
10½	7′ 2⅜″	10′ 8⅜″	14′ 5″
11	7′ 6½″	11′ 2½″	15′ 1¼″
11½	7′ 10⅝″	11′ 8⅝″	15′ 9½″
12	8′ 2¾″	12′ 2¾″	16′ 5¾″
12½	8′ 6⅞″	12′ 8⅞″	17′ 2″
13	8′ 11″	13′ 3″	17′ 10¼″
13½	9′ 3⅛″	13′ 9⅛″	18′ 6½″
14	9′ 7¼″	14′ 3¼″	19′ 2¾″
14½	9′ 11⅜″	14′ 9⅜″	19′ 11″
15	10′ 3½″	15′ 3½″	20′ 7¼″
15½	10′ 7⅝″	15′ 9⅝″	21′ 3½″

STANDARD SPECIFICATIONS FOR NATCO GLAZED STRUCTURAL FACING TILE

1. DESCRIPTION Structural Glazed Ware for the walls of (Schedule of rooms) shall be First Quality (Salt Glazed) or (Ceramic Glazed) Structural Glazed units made on a fire clay body. The field units shall be (State Color and Shade No.) with units for (Cove Course, Cap Course, Trim, Borders, Panels, Etc.) and shall conform to the samples submitted and approved for this operation. The plans show the general scheme of decorative treatment and indicate where the colors are to be used.

2. SIZES AND SHAPES Units shall be (State Face Dimensions) in face size and 1¾″, 3⅞″, 5⅞″ or 8″ in thickness as shown on the plan. All necessary shapes shall be furnished as required. In general, all external corners, sills, jambs and lintels shall be bull-nosed. At the floor there shall be a base (with or without cove) in shade (contrasting to or the same as) the shade used in the field. (If a cap course is desired, state type and shade). (If header or bonding courses are to be used, so state. All two face walls or partitions shall be built of two single face units bonded.

3. QUALITY All units shall be of the highest structural and mechanical quality with shading consistent with manufacturing processes and samples approved. All units shall be reasonably straight and true with finished faces free from chips, crazes, blisters, crawling and other imperfections noticeable at a distance of 5 feet. All units shall conform to Standard Grading Rules of Glazed Brick and Tile Institute.

4. FINISH All surfaces that will be exposed when the units are laid in the wall, shall be finished with a uniform glaze which shall cover all exposed surfaces thoroughly.

4a. The glaze of a ceramic unit shall be:
- (a) Matt—(non-reflecting)
- (b) Satin
- (c) Glossy—(Lustrous—image reflecting)

4b. The glaze of ceramic glazed units or the finish of a clay coated unit shall be applied prior to final burning and shall be made permanent and viterous by burning.

4c. The glaze of salt glazed units shall be produced by introducing salt into the fire during the burning process.

4d. Salt glazed products shall not be used where ceramic glazed is specified.

4e. Clay coated shall not be used where ceramic glazed is specified.

4f. Facing Tile shall not be used where glazed or coated products are specified.

5. CORING All units may be either solid or cored up to 45% of the gross sectional area. When specified for use in Post Office workrooms or places where walls are unprotected against continuous heavy impact, units shall not be cored to exceed 25%.

6. TESTS ON CERAMIC GLAZES

6a. Grazing, Spalling, Peeling and Cracking: A definitely controlled and recorded steam autoclave test shall be made as follows: Three units carefully marked for identification shall be tested. They shall be thoroughly dry and then placed in an autoclave and the steam pressure started and slowly brought up to between 25 and 30 pounds pressure in thirty minutes, the pressure then increased gradually to between 65 and 75 pounds in the next fifteen minutes, then increased gradually to 150 pounds in not less than fifteen minutes. The pressure shall then be held at 150 pounds, plus or minus 5 pounds, for a period of one hour. The pressure shall then be released by a gradual opening of the autoclave to allow a gradual cooling over a period of not less than thirty minutes, to room or hand-handling temperature. The brick shall then be removed and examined. Ink shall then be applied to the finish and allowed to stand for five minutes, the surface washed with a wet cloth and running water and any development of crazing, spalling, peeling or cracking may be cause for rejection.

6b. Imperviousness: Liquid ink or Methylene blue shall be applied liberally to the finish, and allowed to stand for five minutes. The surface shall then be washed with a wet cloth and running water, and examined. If any trace of the ink or Methylene blue shall remain, it may be cause for rejection, except with a matt, stippled or mottled finish, a slight discoloration in depressions will not be cause for rejection.

6c. Opacity of Finish: If opacity of the finish of the glazed face is required it may be tested by applying ink or Methylene blue to the body of the burned product close to the finished surface. It may be grounds for rejection if, after five minutes, there is any visible indication of penetration of the coating by the liquid when viewed through the glazed surface.

6d. Acid Resistance: A portion of the finished surface of one or more units shall be submerged in a 10% solution of hydrochloric acid for three hours, cleaned and examined. The color and/or luster of the finish shall not be altered by this treatment.

7. SALT GLAZES Salt glazes shall have a smooth, lustrous, light reflecting surface, resistant to the acid test for Ceramic Glazes and resistant to pencil and crayon marks.

8. CLAY COATED This shall have a dull non-reflecting coating which will resist ink stains.

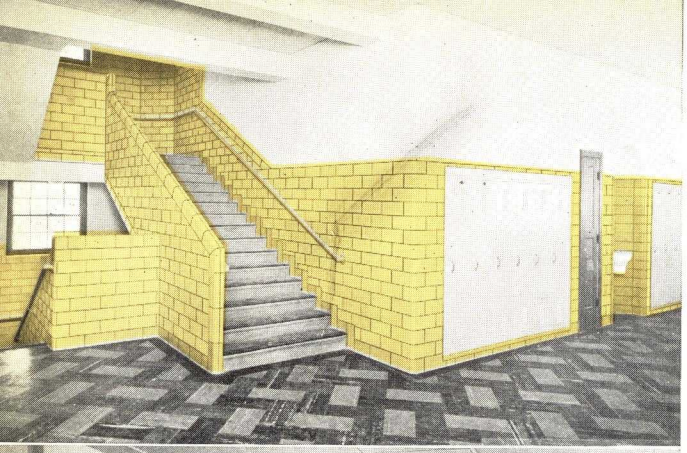
9. FACING TILE This shall be a "face brick" finish devoid of coating and subject to the same size and structural tolerance as glazed ware.

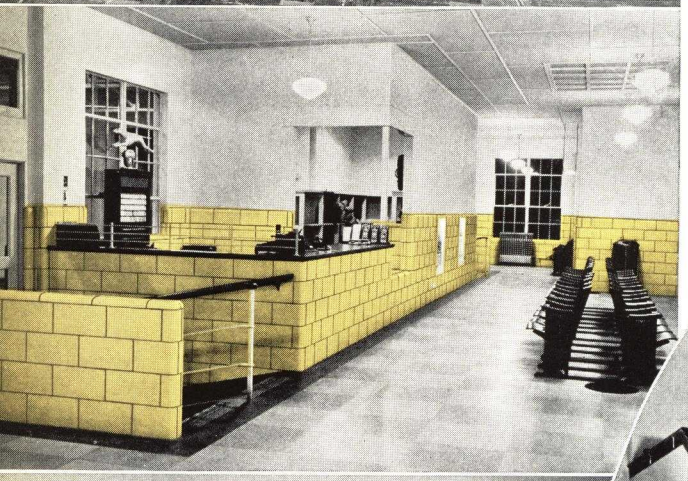
10. ABSORPTION OF BODY When the units are intended for use where exposed to frost action, the absorption of the body of the unit by 24-hour submersion in cold water shall not exceed 14 per cent, and in addition the units shall conform to at least one of the following requirements for absorption:

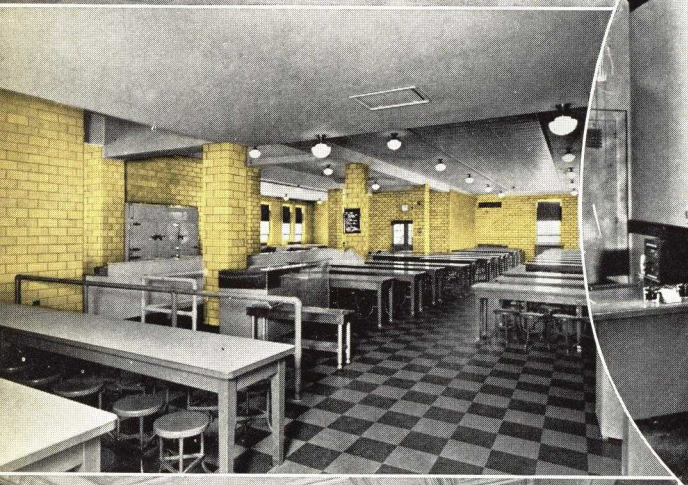
The absorption by 24-hour submersion in cold water shall not exceed 7 per cent.

The ration of the absorption by 24-hour submersion in water to the absorption by 5-hour submersion in boiling water shall not exceed 0.80.

11. PACKAGING All A-Grade Ceramic Glazed, Salt Glazed and Clay Coated units shall be shipped in cartons or trays.



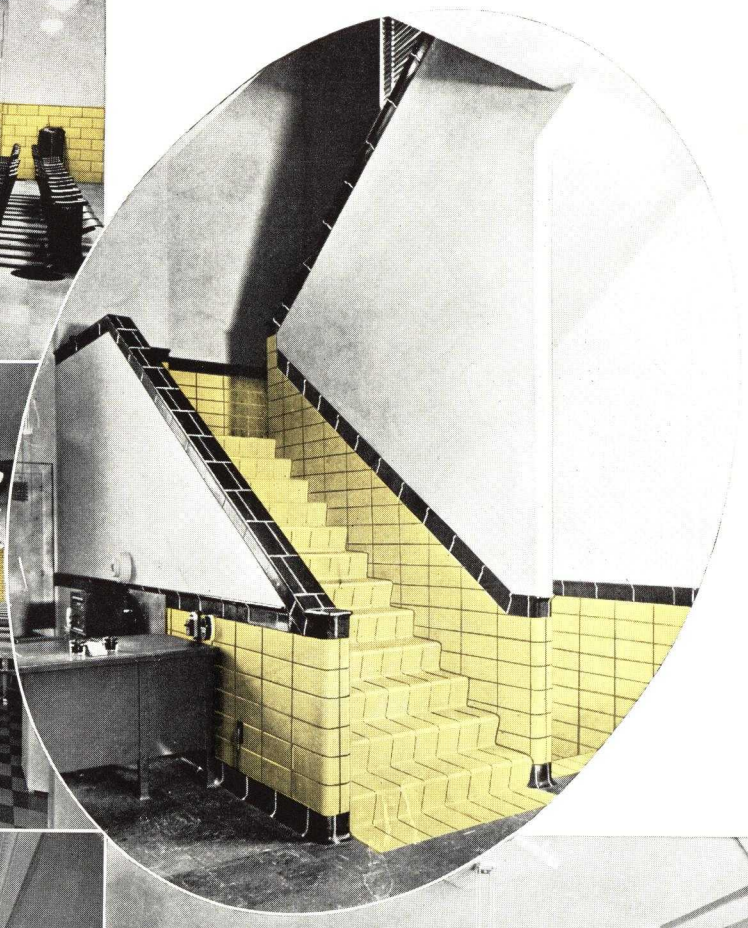


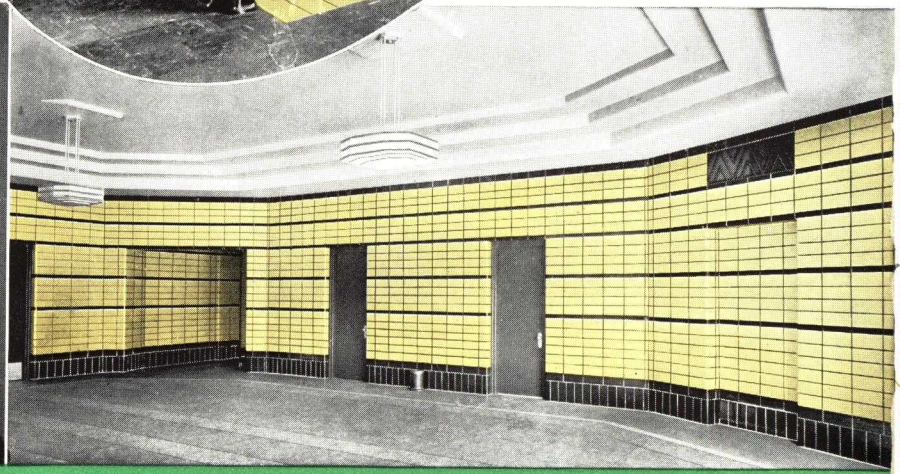


FOR EVERY TYPE OF BUILDING

Natco Glazed Structural Facing Tile has an application somewhere in every building, everywhere in some buildings. It is ideal for the walls, partitions and wainscots in laboratories, schools, airports, restaurants, gymnasiums, corridors, lavatories, shower rooms, garages, abattoirs, breweries, distilleries, hotel kitchens and supply rooms, hospitals, power houses, auto service and filling stations, dairies, creameries, army barracks, auditoriums and recreational buildings, food product plants, post offices, meat packing plants, offices, chemical plants, natatoriums, waiting rooms and similar applications.

Natco Glazed Structural Facing Tile is manufactured by a corporation established in 1889, which has been in that particular line of business continuously since that time.





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SINCE 1889

NATIONAL FIREPROOFING CORPORATION

GENERAL OFFICES: PITTSBURGH, PA

Branches: New York, 205-17 E. 42nd St. Chicago, Morton Building Philadelphia, Architects Building

Detroit: 5737 Commonwealth Ave. & N. Y. C. R. R. North Birmingham, Ala.

In Canada: National Fire Proofing Company of Canada, Ltd., Toronto, Ontario

STARK

GLAZED ~ UNGLAZED FACING AND FLOORING PRODUCTS

THE STARK BRICK COMPANY, CANTON, OHIO

THE STARK BRICK COMPANY

CANTON, OHIO

THE BELDEN-STARK BRICK CORPORATION, 15 East 26th Street, New York City, N. Y.
THE BELDEN-STARK BRICK COMPANY, 14305 Livernois Ave., Detroit, Michigan
THE STARK BRICK COMPANY, 228 N. LaSalle Street, Chicago, Illinois

REPRESENTATIVES IN PRINCIPAL CITIES

During more than a quarter century of advancement in the production of glazed material, Stark has always been a pioneer.

They, building through the years, have gained wide recognition as the leader in the production of the finest glazed and unglazed products of the highest quality.

Manufacturing and engineering experience, financial responsibility, and large plant capacity assure satisfactory service of any requirement.

The Stark line of facing and flooring products and special usage units is most complete and the wide variety of sizes, types, and finishes offers to the architect the widest latitude in design and the ability to work out practically any architectural motif.

The many finishes and colors of Stark Products are given on page four hereof. Four face sizes are offered in four wall depths and two floor depths.

Shapes and structural details showing all standard and special shapes and their typical usage are illustrated and described upon the following pages.

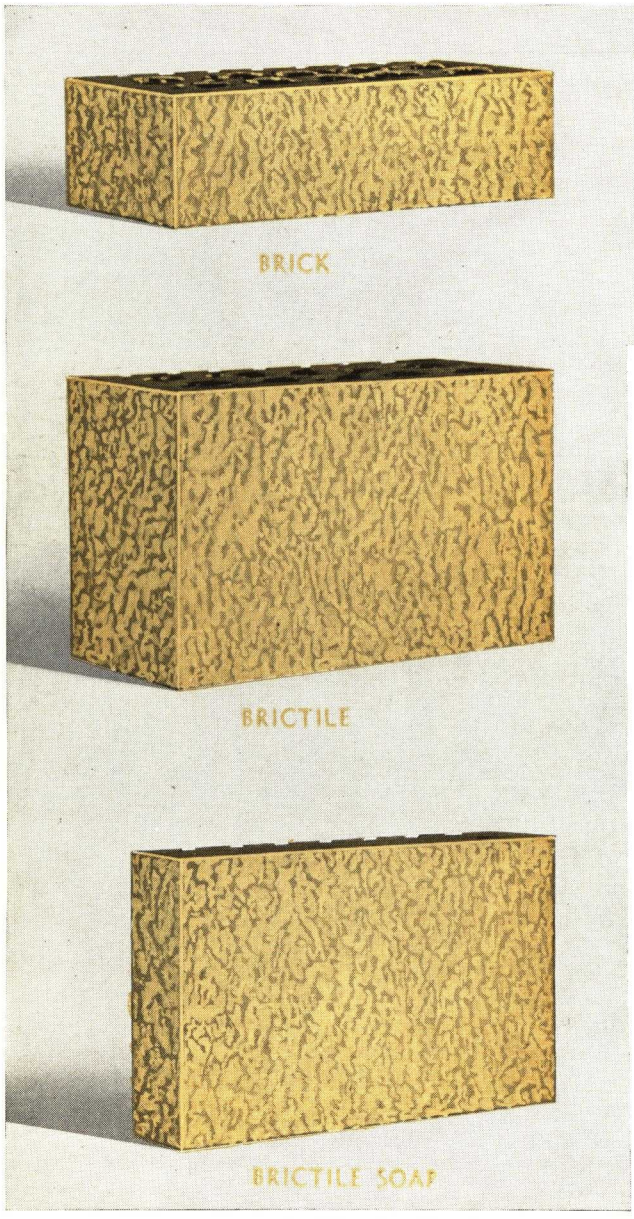
Three plants equipped with modern and advanced equipment and manned by a personnel with years of experience, assure satisfactory service and high quality upon projects of any size.

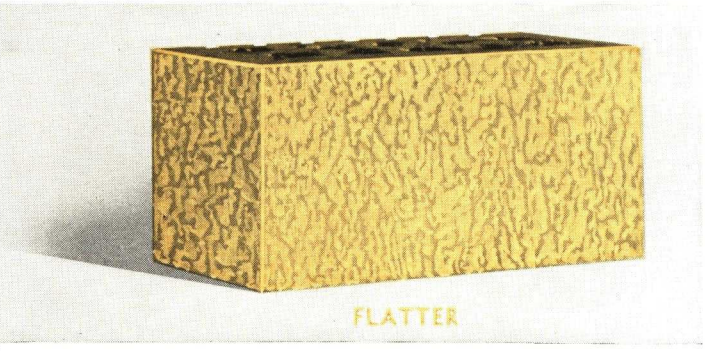
De-Airing Equipment, and the precision method employed at every stage of the manufacturing process, insures the highest quality attainable.

Stark (glazed) products are all produced with vertical void coring to enable the securing of a full head joint and have mortar lock coring for the bed joint to prevent floating in the wall.

Loadbearing requirements of Federal, State and Municipal Codes are fully met by all units of the Stark line.

The standard guarantee of the Glazed Brick and Tile Institute reproduced on page 16 is made on Stark Products.





BRICK "S" SERIES, 2¼" x 8" FACE

Stark Glazed Brick have been the standard of quality since 1911 and offer the ultimate in variety, charm and permanence for buildings of any type. Its wide variety of colors and finishes makes it particularly adaptable to the modern trend in architectural design.

Available in all finishes.

"BRICTILE" "D" SERIES 5" x 8" FACE

This popular size unit was first introduced by Stark in 1927 and today is the largest selling glazed unit. Produced in standard 3⅞" bed depth, soap 1¾" furring or veneering bed depth, and 5⅞" and 8" bonding wall depth units.

Available in all finishes.

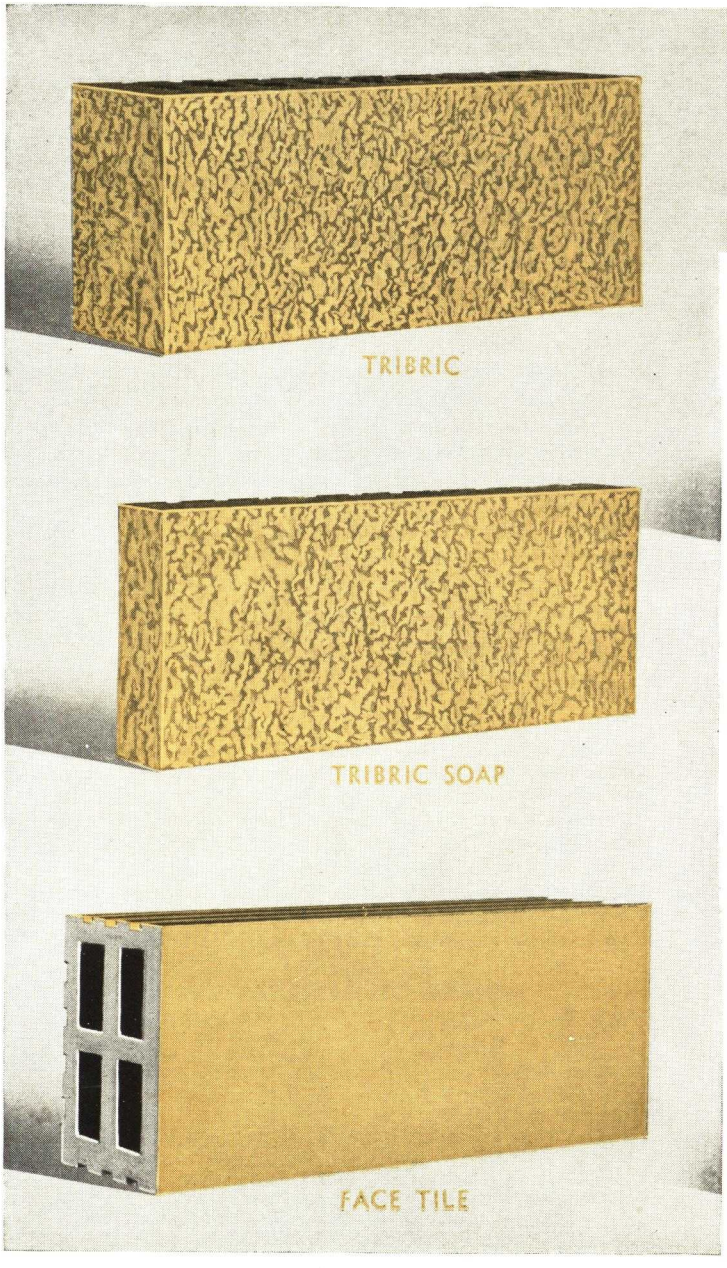
FLATTER "F" SERIES 3⅞" x 8" FACE

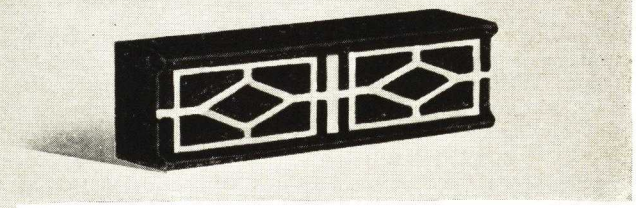
A rowlock or soldier construction unit desirable for many architectural effects. Produced in standard 3⅞" bed depth, and soap 1¾" furring or veneering bed depth.

Available in Ceramic "Colorglaze" and Salt Glaze finishes.

ONLY STARK MAKES "BRICTILE"

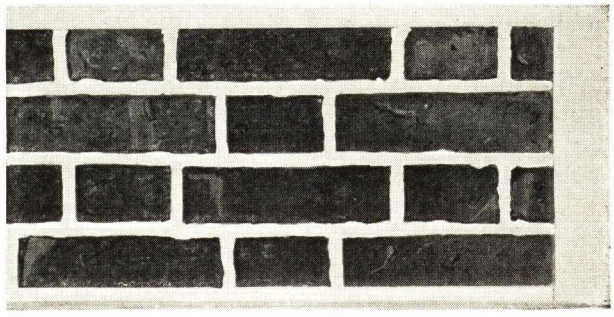
COPYRIGHTED 1938, THE STARK BRICK CO.





BRICK GEOMETRIC CAP

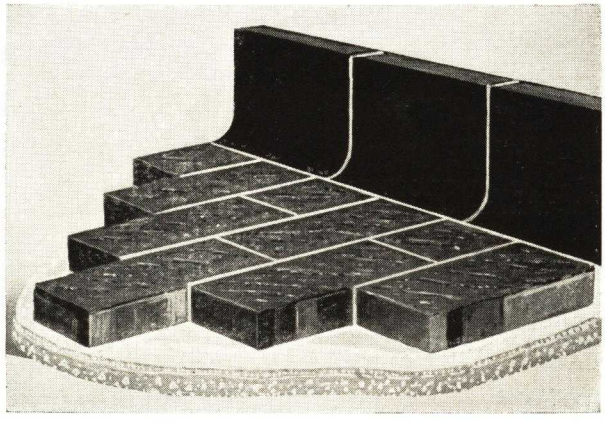
One of many special designs detailed on page seven.



WATERSTRUCK BRICK

An ideal product when design architectural motif are of extreme importance, and when a brick having a great character of design is desired. Face size: 2⅛" x 8".

Full description and illustrations on following page.



"TRIBRIC" "T" SERIES 5" x 12" FACE

An increasing popular wall unit. The vertical void design assures full head joint and ease of cutting, make it most economical to lay.

Available in all finishes.

FACE TILE 5" x 8" AND 5" x 12" FACE

Facing Tile as manufactured by Stark is a quality product and gives less absorption and more sanitation than most other unglazed materials. Facing Tile used as a load bearing material compares favorably with the cost of plastered walls and never needs replacing or repainting. They are manufactured with horizontal void and in pleasing buff and gray shades. They are light weight, free from blisters, ragged edges, and as straight and true as careful manufacture can produce. Available in standard 3¾" bed depth; soap 1¾" "furring or veneering" bed depth; also in bonding 5⅞" and 8" bed depths. For closures, "Brictile" and "Tribric" articulate perfectly with Face Tile.

Available in Unglazed Finish only.

SANITARY FLOOR BRICK 3⅞" x 8" FACE

Stark offers a thoroughly vitreous, de-aired vertical fiber, Floor Brick, burned to a blue carbon manganese body from high grade fire clay. This unit is recognized throughout the country as being the best wearing material for floors where exposed to severe traffic, acids (except hydrofluoric), brines, milk, blood, grease and oils.

Sanitary Floor Brick have long life and will stand up under conditions where practically all other floor materials deteriorate. This caused their adoption as standard by many of the larger food processing plants where enduring, acid-resisting, non-skid flooring is required.

The surface is wire cut to give an anti-skid surface.

Available in carbon-manganese, glaze, or buff unglazed.

See following pages for additional information as to Finishes, Colors, Shades, Grading, Uses, Shapes, Laying Details, and other pertinent facts.

USES AND ADVANTAGES

Each type and finish of Stark product has certain special advantages, but all have the advantages of: High degree of sanitation; Walls impervious to moisture; Surfaces that resist fire, acids, and grease; Ease of cleaning; High light reflection or diffusion varying with each type; Permanent beauty and color; Great facility in architectural design.

INTERIORS. Any type of Stark wall units may be specified where a loadbearing or veneering wall with a sanitary, permanent facing is desired. Colorglaze, Salt Glaze or Sanicote are particularly adaptable to interiors where color and light reflection or diffusion are desired, together with sanitation, permanency, and low eventual cost of upkeep.

Unglazed is a lower priced material particularly adapted to usage above a wainscot of Stark glazed or Sanicote units, to replace plaster.

EXTERIORS. Ceramic "Colorglaze" with a glossy, satin or matt finish is the finest of materials for exterior facing in any type or size of building. Sanicote at lower cost gives color and cleanliness without glare. Unglazed units offer a light, permanent exterior of high grade materials at lowest cost.

Water struck brick is a traditional material for buildings designed in the colonial manner.

All will give long and satisfactory service with a minimum of upkeep when installed in keeping with good practice as to flashing, coping, and mortar. See page 16 for construction recommendations.

USAGES. For walls and floors of all types of buildings and such special usages as acid, brewing and distilling vats, pickling tanks and swimming pools.

Stark products are being currently used in the construction of the following and other types of buildings:

Hotels, apartments, and residences.
Schools, Post offices, Orphanages, and other public buildings.
Railroad and bus terminals, airports and docks.
Churches, armories, hospitals, and other semi-public buildings.
Distilleries, breweries and bottling plants.
Canneries, packing houses, abattoirs, and other food processing plants.
Factories, steel mills, and warehouses.
Dairies, bakeries, service stations, and retail stores.

FINISHES, COLORS AND SHADES

WALL TYPES

CERAMIC COLORGLAZE The finest type of glazed ware, having a vitreous coated face. These are compounded of well-known chemicals, thoroughly ground together, then sprayed on a previously formed fire clay body. The sprayed unit is then burned at over 2000° F. which fuses the glaze to the body in such a fashion that it is impossible to separate the two, as their co-efficients of expansion are identical, and the glaze becomes an integral part of the body. Furnished in Field and Trim shades; in smooth, mottled or stippled textures; and in gloss, satin or matt finishes as set forth below.

FIELD SHADES

Smooth (GL)
520—White
535—Cream
540—Ivory
550—Yellow
560—Gray
585—Peach
595—Surf

Mottle or Stipple (GM)
681—White and White
680—Buff and White
682—Buff and Cream
683—White and Tan
685—Cream and Brown
684—Cream and Maroon
620—Black and White

GLOSS SHADES, SMOOTH (GB)

510—White Lustre
530—Ivory Lustre

TRIM SHADES (GT)

570—Azure Blue (Light)
571—Aster Blue (Medium)
572—Yale Blue (Dark)
596—Antique Green (Light)
598—Hunter Green (Dark)
586—Golden Tan
581—Maroon
580—Granada Brown
590—Gloss Black
690—Black Mottle

Available in Brick, Brictile, Flatter and Tribric
Graded, Super, or "A"; Court, or "B"; Commercial, or "C"; Qualities

SANICOTE A vitreous clay coating fully covering the face, burned at a high temperature and similar in appearance to the highest grade smooth face brick manufactured from fire clay. The ideal product where a maximum of light reflection without glare and clean colorful non-absorbent walls are desired. Furnished in Field and Trim shades in the following colors:

LIGHT SHADES (S)
730—Cream
760—Gray Limestone
761—Blue Gray
785—Peach

TRIM SHADES (ST)
796—Green
798—Dark Green
771—Blue
780—Brown
790—Black

Available in Brick, Brictile and Tribric
Graded, Super, or "A"; Court, or "B"; Commercial, or "C"; Qualities.

UNGLAZED Structural units of the highest type produced from the same materials and with the same workmanship as Stark glazed products. A quality product adaptable to any structure where face brick would be used. As a loadbearing material, compares favorably with the cost of plastered walls. Furnished in grades and shades as follows:

Select Quality (A Grade) A blend of buff shades.
Standard Quality (B Grade) A blend of buff and grey shades.
Industrial Quality (C Grade) No color selection.

Available in Brick, Brictile, Tribric, and Face Tile.

STARK SALT GLAZE A glossy Stark Salt Glaze is applied to a fireclay body as a vapor while the units are at a temperature over 2000 degrees F. The resultant glaze, being transparent, presents the color of the fireclay body—gray, cream or buff. Salt Glaze (sodium alumina silicate) is smooth, lustrous (image reflecting), resists pencil or chalk markings, and is one of the oldest known forms of glazing. Salt glazed ware produced centuries ago is still in an excellent state of preservation and without doubt it is the most economical form of sanitary wall construction. Available in shade ranges and mingled shades as follows:

SUPER QUALITY "A" GRADE

Shade Ranges (GSS)
50—Creamy Gray
55—Cream
60—Light Buff
75—Medium Buff

Mingled Shades (G)
Gratone—A blend of Gray shades
Creamtone—A blend of Cream shades
Buftone—A blend of Buff shades

COURT AND COMMERCIAL QUALITIES
"B" AND "C" GRADES

Gray Mingle—A mingle of Gray and Cream shades.
Light Mingle—A mingle of Cream and Buff shades.

Available in Brick, Brictile and Tribric

WATER STRUCK Hand mould water struck Colonial brick, reproducing the Early American with complete fidelity of color, texture, size and finish. All required shapes for exterior work are available. Furnished in shades as given below:

"Harvards" Blend of dark and medium reds in shades characteristic of New England products.
"Radcliffes" Blends of rose, light red and saffron shades found in many early American buildings of distinction.
"Malvernes" Blend of dark, medium and light reds with browns and tans. Includes a percentage of dark flashed headers.

Available in Brick only

FLOOR TYPES

CARBON MANGANESE GLAZE A salt, carbon and manganese glaze burned into a high grade fire clay body. The resultant vitrified blue body is low-absorbent, non-abrasive and acid resistant. Produced in full glazed and semi-glazed types.

Dairy Type Full glazed units selected for a rich blend of maroon shades.
Packer Type Blue bodied semi-glazed units having a maximum of non-skid qualities in maroon and brown shades.
Acid Type Blue bodied fully glazed units, resistant to all acids (except hydrofluoric). No color selection.

Available in Standard and Heavy Duty sizes
Graded, First "A", and Second "B" Qualities.

Court, Commercial, Standard, Backup and Common qualities or B and C Grades are offered subject to stock only.

DEFINITIONS ON GRADING

GLAZED OR SANICOTE WALL TYPES

SUPER QUALITY (A GRADE) Units of the highest structural and mechanical perfection consistent with the manufacturing process employed.

The variation in dimensions from standard dimensions shown on page 2 and 3 shall not exceed the maximums shown below:

	Brick	Flatter	Brictile	Tribric
Length	1/8"	1/8"	1/8"	5/32"
Height	1/16"	3/32"	3/32"	5/32"
Depth	1/8"	1/8"	1/8"	1/8"
Maximum tolerance for distortion of the plane and for the edge of the face shall be	3/64"	1/16"	1/16"	1/8"

Only a reasonable percentage shall approach the maximum

COURT QUALITY (B GRADE) Units having slight mechanical and/or glaze or coating defects, including small handling chips. Variations in dimensions greater than the tolerances for "A" Grade are permissible.

COMMERCIAL QUALITY (C GRADE) Units having larger defects: including handling chips, glaze or coating defects, factory and kiln marks, or with dimensional variation beyond that for "A" or "B" Grades.

UNGLAZED WALL TYPES

SELECT QUALITY (A GRADE) Units as true and mechanically perfect as careful manufacture can produce.

The variations in dimensions from standard dimensions shall not exceed the maximum shown below:

	Brick	Brictile	Tribric	8" Tile	12" Tile
Length	5/32"	5/32"	1/4"	3/16"	5/16"
Height	1/16"	1/8"	1/8"	5/32"	5/32"
Depth	3/16"	3/16"	3/16"	3/16"	3/16"

Maximum tolerance for distortion of the plane and/or the edge of the face shall be 3/16".

STANDARD QUALITY (B GRADE) Wider shade variation with some mechanical defects, including small handling chips and slight flashing, but meeting all requirements of loadbearing, structural units. Variations in dimensions greater than the tolerance for "A" Grade are permissible.

INDUSTRIAL QUALITY (C GRADE) Loadbearing units, either imperfect mechanically; dusted, stained or chipped, or with dimensional variations beyond the limits for "A" and "B" Grades.

FLOOR TYPES

FIRST QUALITY (A GRADE) As true and mechanically perfect with as uniform a glaze and color as possible in the type of product.

SECOND QUALITY (B GRADE) Slight mechanical imperfections and distortions, overglaze, handling and glazing defects. Not selected for color.

GENERAL

CLEANING. It is unnecessary to use acid to clean Stark Glazed walls. The acid will not harm the hard glazed surface, but it does damage the mortar joint. Masons should be provided with burlap or cloths to remove mortar as the work progresses. After the wall is finished, clean by scrubbing with a bristle brush, detergent and water.

CRUSHING STRENGTH. Loadbearing requirements of Federal, State and Municipal Codes are fully met by units of the Stark line.

SERVICE. Three plants and 65 kilns, plus a yard stock of from ten to twelve million units, allow normal prompt service on orders of any size.

PACKING AND SHIPPING. Super quality in all wall units and all shapes will be packed in patented containers. Other qualities of the above and other types of ware will be carefully loaded in straw, properly bonded and braced. Units regularly shipped in straw will be packed in containers at an extra cost.

ENGINEERING. Our engineering department is glad to cooperate with and recommend to architects and engineers the most economical and practical adaption of our products to any common or unusual condition.

SAMPLES. Samples will be sent to architects, engineers, contractors, and owners on request, without charge.

SHAPES EXPLANATORY NOTES

The Stark brick & tile shapes are arranged according to series. These series are based on face dimensions of the stretcher unit. (The standard depth or bed dimension of full shapes in all series, unless otherwise noted, is 3⅞" and that of soaps is 1¾"). Each series is designated by a letter which is also used as a prefix to the shape number.

Series	S	F	D	T
Height in inches...	2¼"	3⅞"	5"	5"
Length in inches...	8"	8"	8"	12"

The shapes in each series are classified into group according to the amount of special work required in the manufacture and percentage of kiln recovery. In general, the units are classified in shape groups as follows:

SHAPE GROUP—TYPES OF SHAPES GENERALLY INCLUDED.

STRETCHER Plain face stretcher unit.

GROUP I Jambs, Header Sills, Coved Corner, and Octagon.

GROUP II Cap, Cove, and Sill Stretchers.

GROUP III Recessed Lintels, Two Face Wall Ends, Copings and other Double Radius Stretchers.

GROUP IV Handmade Fittings.

GROUP V Group IV Shapes with altered or additional faces.

SALT GLAZED 6" and 8" Bonding Stretcher will take the two face differential when ordered either glazed two face or smooth back.

RETURN indicates the depth of the finished head or short face of a closure unit.

REVEAL indicates the depth of the top face of a sill or cap or the bottom face of a lintel.

RIGHT OR LEFT HAND SHAPES as shown are available in the opposite hand. When facing a shape and the long face is to the right, it is a Right Hand, and vice versa. (Suffix L is left and Suffix R is right).

QUOINS are corner units with right angle (square) edges. It is unnecessary to order quoins in salt glazed or clay coated units unless more than 15% of the total stretcher order is required in quoins.

BULLNOSE RADIUS 1" radius bullnose is standard. Any radius other than 1" will take a higher shape group.

ANGULAR SHAPES of odd size (other than 90° and 45°) are made on special order. They are Group III if plane surface; Group V if cove, cap or other irregular profile.

RADIAL STRETCHERS (plane profile) and Fittings are Group V. Made on special order only.

ARCH UNITS are Group IV shapes—made to special order only.

SPECIAL CAPS Coves, Etc.—having profile other than shown as standard are made to special order only. Such specials are classed in a Shape Group higher than that for similar standard shape.

DECORATIVE UNITS Are available on special order.

FACE TILE UNITS The symbols in circles on page 15 denote the price class, S stretcher, SD two face stretcher, S2 soap stretcher, S6 six-inch stretcher, S6D two face six-inch stretcher, S8 eight-inch stretcher, S8D two-face eight-inch stretcher, L class one shape, 4 class four shapes.

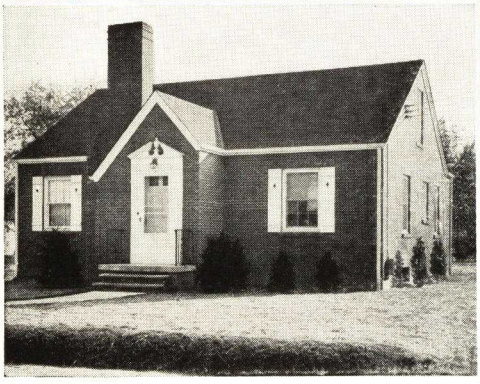
HAND MOULD WATER STRUCK BRICK

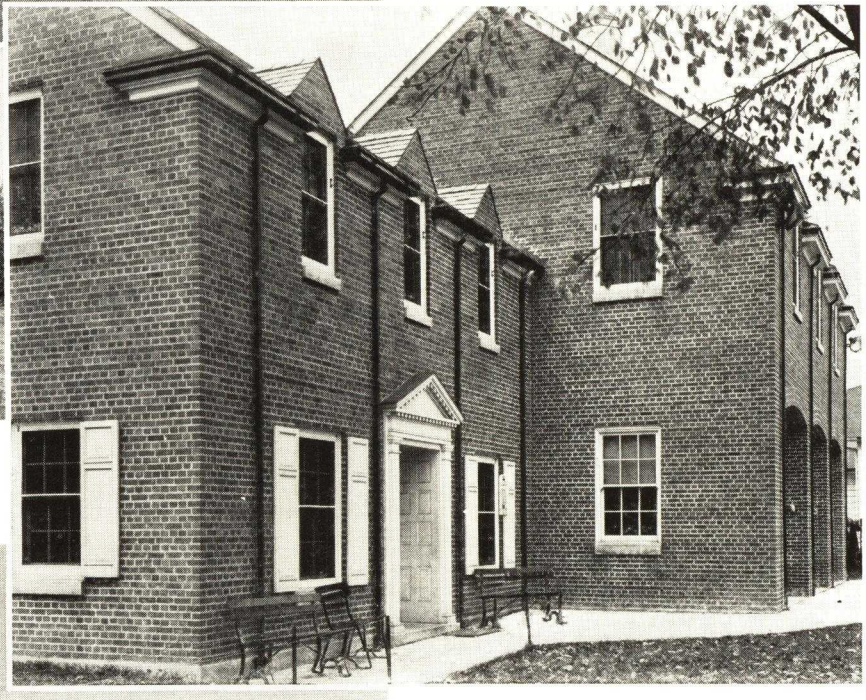
Rare beauty found in Water Struck Brick has enlarged the area of charm. Reproducing the Early American in complete fidelity of color, they have been elevated from mere utility to elegance and distinction.

The old adage written, "Imperfection is perfection in Art," was truly stated when viewing the rare beauty found in hand mould Water Struck Brick. The creation of imperfect contours by master craftsmen truly makes them a work of art.

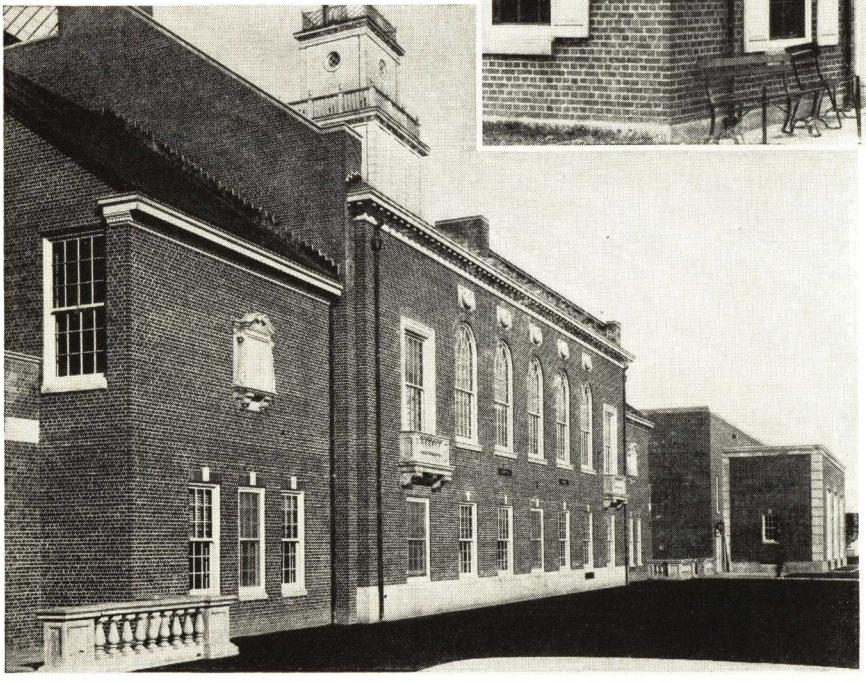
These artistic brick of clay should not be confused with shale brick having mechanically made face and edges. Only by the use of the hand mould, Water Struck process is it possible to obtain the artistic and rugged effects which are so eagerly sought by all artists.

Available in three traditional blends as follows: "Harvards"—Blend of dark and medium reds. "Radcliffes"—Blend of rose, light red and saffron. "Malvernes"—Blend of dark, medium and light reds with brown and tan. Includes a percentage of dark flashed headers.





Enhanced in beauty and dignity, these modern homes strike a note of stability and security. No costly repairs or constant upkeep are ever necessary.



Above: Engine House, Green Bay, Wisconsin.
Left: Menasha High School, Menasha, Wisc.

Architects: Foeller, Schober & Berners, Green Bay, Wisc.
Materials: Water Struck "Malvernes" Full Range.

Water Struck Brick combines both structural and decorative qualities unequalled by any other building material.

The architectural integrity is maintained by utilizing the artistic qualities found in Water Struck Brick and then by taking advantage of its almost unlimited design possibilities.

DESIGN CAPS, BANDS AND INSERTS

Stark is here presenting a new departure in Cap and Band Course treatment and a line of decorative wall inserts. All units here shown are made with recessed false mortar joints outlining the designs and details. After being set in the wall, recesses are filled with the regular mortar used, giving the appearance shown in the photographs on this page.

CAPS AND BANDS. Brictile units are designed for band course or flush plastering. If a protruding cap is desired for plastering, use S-40 shown on page 8, set out ¼" from face of wall above either D-1040 or D-2040. The bead upon brick size units (S-1040) is intended to set out ¼" from the wall, making the face in the same plane as the field of the wall. They are glazed back ½" on both top and bottom reveal for setback plastering and wall finish. *Furnished in "Colorglaze" Trim Shades only.*

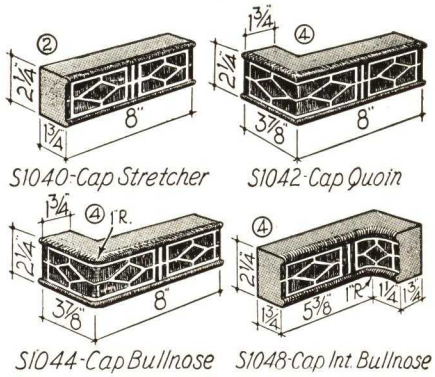
INSERTS. Furnished in a variety of designs in sizes from 5" x 8" to 20¾" x 78". Each unit is hand painted in two to six Sanicote colors before final burning. The large size units are furnished in two or more pieces, which after being fitted together in the wall and pointed up, cannot be distinguished from one piece.

A special catalog of designs available will be furnished upon request.

BRICK GEOMETRIC CAP DESIGN

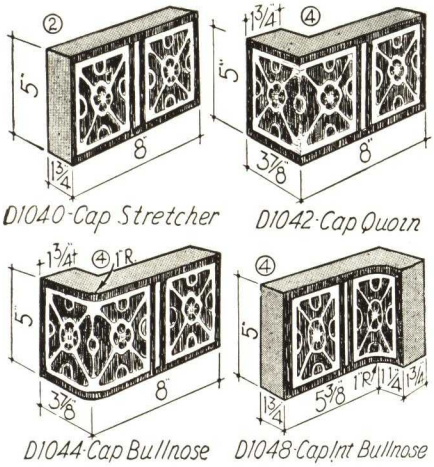
BRICK GEOMETRIC SHAPES

"S" SERIES 2¼"x8" FACE



BRICTILE GEOMETRIC SHAPES

D SERIES 5"x8" FACE



BRICTILE INDIVIDUAL BORDER DESIGNS

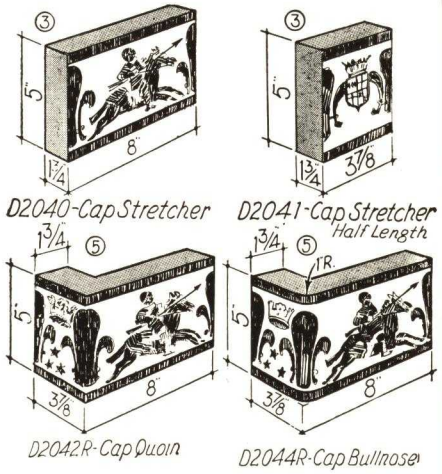
58C OAK LEAVES 5"x8"

BRICTILE GEOMETRIC CAP DESIGN

BRICTILE ENGLISH CAP DESIGN

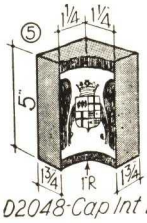
BRICTILE ENGLISH SHAPES

"D" SERIES 5"x8" FACE



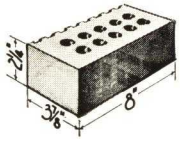
BRICTILE INDIVIDUAL BORDER DESIGNS

58A HORSEMAN 5"x8" 58B RABBIT 5"x8"

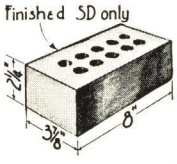


SERIES "S" 2¼" x 8" FACE • • ONE BRICK EQUIVALENT UNITS

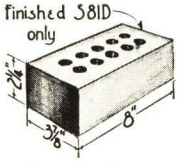
STRETCHER GROUP



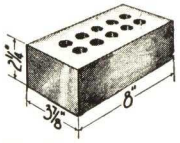
Sgr. Stretcher, Scored Back



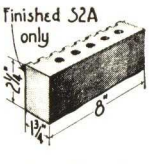
Ssm Stretcher, Smooth Back
SD Two Face Stretcher



S81 Header
S81D Two Face Header



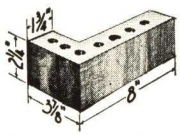
S2 Quoin
S2H Quoin, Half



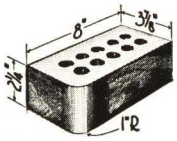
S2A Soap Stretcher
S2A Soap Quoin (Square) 2" Return

Unless job conditions require either SMOOTH or SCORED BACK STRETCHERS, shipment may be facilitated by ordering S Stretchers, thereby permitting manufacturer to ship either the scored or smooth back stretchers or a mixture. Type and direction of SCORING and CORING are optional with each manufacturer. In general, each manufacturer standardizes on either the horizontal or vertical coring and does not supply both.

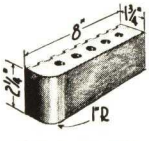
GROUP I SHAPES—Jambs, Corners and Octagons



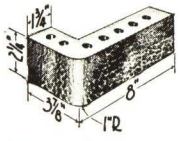
S2B Soap, Quoin (Sq.) Jamb, 4" Return



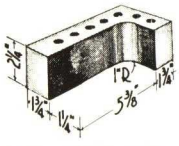
S4 Bullnose Jamb
S4H Same, Half



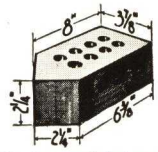
S4A Soap, Bullnose Jamb, 2" Return



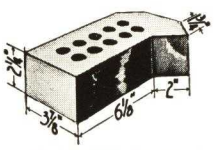
S4B Soap, Bullnose Jamb, 4" Return



S8 Coved Internal Corner

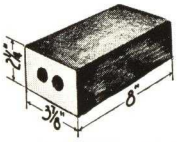


S6 External Octagon
S6A Same, Soap

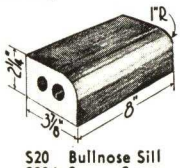


S9 Internal Octagon
S9A Same, Soap

GROUP II SHAPES—Regular Sills



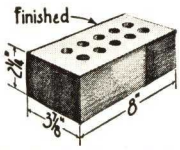
S10 Square Sill, 4" Reveal



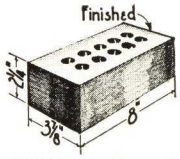
S20 Bullnose Sill
S20A Same, Soap 2" Reveal

S821 Bullnose Sill Header
S811 Square Sill Header

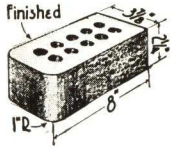
GROUP III SHAPES—Quoin (square) and Bullnose Wall Ends, Recessed Lintels



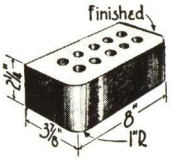
S3 Quoin (Square) End, 4" Wall
S3H Same, Half



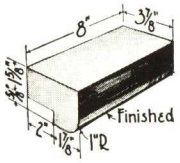
S83H Quoin (Square) End, 8" Wall



S5 Bullnose End, 4" Wall
S5H Same, Half

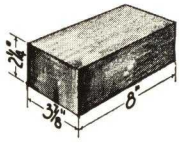


S85H Bullnose End, 8" Wall

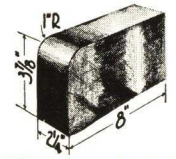


S720 Recessed Bullnose Lintel
S710 Recessed Square Lintel

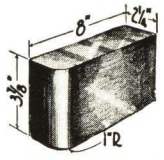
GROUP IV SHAPES—Handmade Fittings



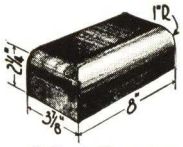
S12R Square Sill Quoin (Square) Right



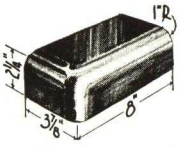
S14R Bullnose Rowlock Sill, Square End, Right



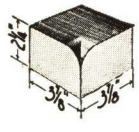
S15R Square Rowlock Sill, Bullnose End, Right



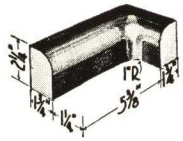
S22R Bullnose Sill, Quoin (Square) Corner, Right
S22HR Same, Half



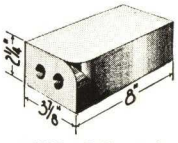
S24R Bullnose Sill, Bullnose Corner, Right
S24HR Same, Half



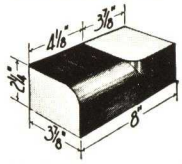
S27H Bullnose Sill, Internal Square Corner, Half



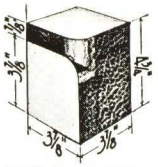
S28L Bullnose Sill, Coved Internal Corner, Left
S28HL Same, Half



S30R Bullnose Jamb Miter, Right
S30AR Same, Soap



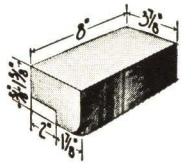
S31R Bullnose Sill and Jamb Miter, Right



S34FR Rowlock Bullnose Sill Miter, Right

SILL SHAPES, shown above, are popular as cap and coping shapes.

S204BR Soap, Bullnose Starter, 4" Return, Right
S204AR Same, 2" Return



S730R Recessed Bullnose Lintel Miter, Right

GROUP V SHAPES includes Radial Stretchers and Fittings and Group IV Shapes with altered or additional finished faces.

An extra charge is made for cutting lengths or heights other than those shown or listed.

An electrically driven saw should be used for all cutting on the job.

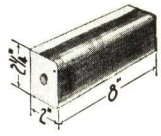
Nominal dimensions are usually given for returns, reveals, etc.; 2" is actually 1¾", 4" is actually 3⅞" and 6" is actually 5⅞".

Cove Base units are not made in one brick equivalents. For Cove Base units to be used with Series "S", see Pages 18 and 19.

For complete explanatory notes, see Page 23.

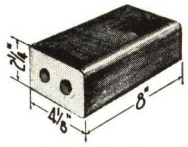
SERIES "S" 2¼" x 8" FACE • • ONE BRICK EQUIVALENT UNITS

GROUP II SHAPES



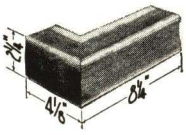
S40A Soap, Cap Stretcher, 2" Reveal

GROUP III SHAPES

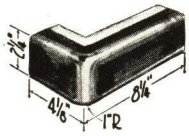


S40M Cap Stretcher, 4" Reveal

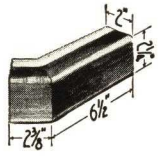
GROUP IV SHAPES—Handmade Fittings



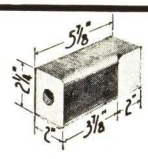
S42 Cap, Square Corner



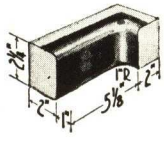
S44 Cap, Bullnose Corner



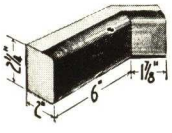
S46 Cap, External Octagon



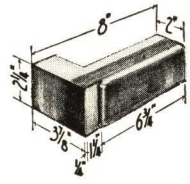
S47 Cap, Internal Square Corner



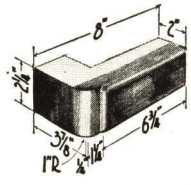
S48 Cap, Coved Internal Corner



S49 Cap, Internal Octagon



S402 Cap Starter Quoin (Square))Corner
S402A Same, Soap, 2" Return



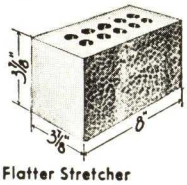
S404 Cap Starter, Bullnose Corner
S404A Same, Soap, 2" Return

Above moulding in 2¼" height is also furnished in lengths to fit Series "T". When ordering, prefix the letter "T" to shape number. (Example: TS40A is a Soap, Cap Stretcher, 2" Reveal, 12" long.)

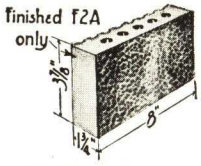
"F" SERIES—3⅞" x 8" FACE 1½ BRICK EQUIVALENT UNITS

USED AS ROWLOCK OR SOLDIER UNITS WITH "S" SERIES

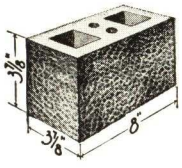
STRETCHER GROUP



F Flatter Stretcher

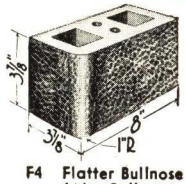


FA Flatter Soap
F2A Flatter Soap Quoin (Square)

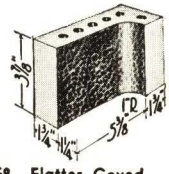


F2 Flatter Quoin (Sq)
F2H Same, Half

GROUP I SHAPES

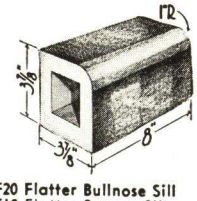


F4 Flatter Bullnose (Also Bullnose Sill Header)
F4H Same, Half



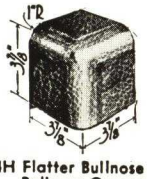
F8 Flatter, Coved Internal Corner
F8H Same 1¼" Return Each Face

GROUP II SHAPES

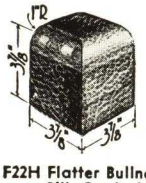


F20 Flatter Bullnose Sill
F10 Flatter Square Sill (Also used as Lintel and Corner Blocks)

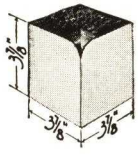
GROUP IV SHAPES—Handmade Fittings



F24H Flatter Bullnose Sill, Bullnose Corner, Half



F22H Flatter Bullnose Sill, Quoin (Square) Corner, Half



F27H Flatter Bullnose Sill, Internal Square Corner, Half
F30H Same Unit, used as Bullnose Miter

F28H Flatter Bullnose Sill, Coved Internal Corner, Half

See Notes on Page 16 and complete explanatory notes on Page 23.

DATA RELATIVE TO JOBS ILLUSTRATED

Front Cover Illustration.

(1) ALLEGHENY HIGH SCHOOL, PITTSBURGH, PA.
Owner: Board of Education.
General Contractor: Dick Construction Co., Pittsburgh, Pa.
Interior: Tribric No. 680 with special ornamental cap 571.

(2) SIGRITZ MINERAL WATER BLDG., DAYTON, OHIO.
Owner: Sigritz Mineral Water Company, Dayton, Ohio.
Architect: C. H. Hock, Dayton, Ohio.
Exterior: Ceramic Brick No. 681; Trim No. 590 and No. 761.

(3) MODERN BASEMENT GAME ROOM.
Owner: Wm. H. Davis, Canton, Ohio.
Architect: Charles E. Firestone, Canton, Ohio.
Contractor: Edwin H. Walker Construction Co., Canton, O.
Interior: Ceramic Colorglazed "Brictile."
Exterior: Radcliffes Range Water Struck brick, Radcliffes range Brick.

(4) LEMINGTON HIGH SCHOOL, PITTSBURGH, PA.
Owner: Board of Education.
General Contractor: Navarro Corp., Pittsburgh, Pa.
Interior: Ceramic No. 685 "Brictile" with special ornamental cap.

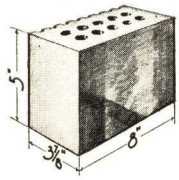
(5) SWIMMING POOL ROOM, ALLEGHENY HIGH SCHOOL, PITTSBURGH, PA.
Material used: Ceramic No. 520 White with Black lane markers, step ladder recesses, marker numbers and lettering.

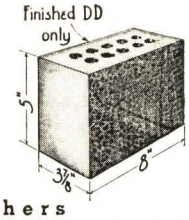
(6) LOCKER ROOM, RIVERSIDE HIGH SCHOOL, FORT WORTH, TEXAS.
Owner: Board of Education.
Architect: Wyatt C. Hendrick, Inc., Fort Worth, Texas.
General Contractor: Harry B. Friedman, Fort Worth, Texas.
Interior: Creamtone "Brictile" for field, shade No. 590 trim.

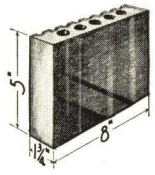
(7) LOBBY OFFICE, CLAY CENTER CITY HALL, CLAY CENTER, KANSAS.
Architect: Johnson & Brose.
Contractor: Johnson & Brose.
Interior: No. 680 Ceramic "Brictile" with No. 590 black trim.

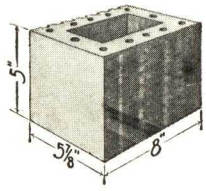
SERIES "D" 5"x8" FACE • • TWO BRICK EQUIVALENT UNITS

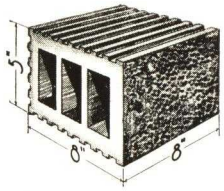
STRETCHER GROUP











D Stretchers

Dgr Stretcher, Scored Back

Dsm Stretcher, Smooth Back
DD Two Face Stretcher

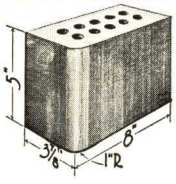
DA Soap Stretcher

D60 6" Bond Stretcher

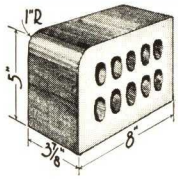
D80 8" Bond Stretcher

Unless job conditions require either SMOOTH or SCORED BACK STRETCHERS, shipment may be facilitated by ordering D-Stretchers, thereby permitting manufacturer to ship either the scored or smooth back stretchers or a mixture. Type and direction of SCORING and CORING are optional with each manufacturer. In general, each manufacturer standardizes on either the horizontal or vertical coring and does not supply both.

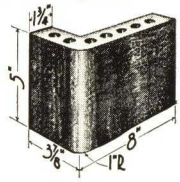
GROUP I SHAPES — Jambs, Corners and Octagons



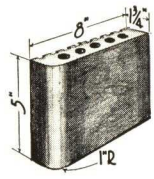
D4 Bullnose Jamb
D4H Same, Half
D2 Quoin (Square) Jamb
D2H Same, Half



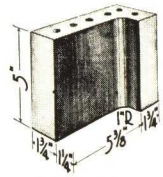
D821 Bullnose Sill Header
D811 Square Sill Header



D4B Soap, Bullnose Jamb, 4" Return
D2B Soap, Quoin (Sq.) Jamb, 4" Return

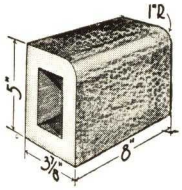


D4A Soap, Bullnose Jamb, 2" Return
D2A Soap, Quoin (Sq.) Jamb, 2" Return

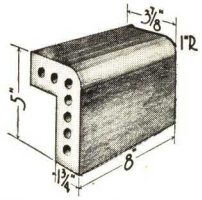


D8 Coved Internal Corner

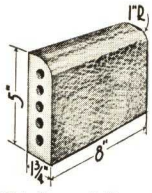
GROUP II SHAPES
Sill, Cap and Cove Stretchers



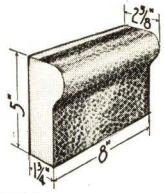
D20 Bullnose Sill, 4" Reveal
D10 Square Sill, 4" Reveal



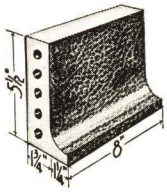
D20B Soap, Bullnose Sill, 4" Reveal
D10B Soap, Square Sill 4" Reveal



D20A Soap, Bullnose Sill, 2" Reveal
D10A Soap, Square Sill, 2" Reveal

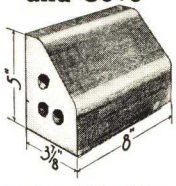


D40 Cap Stretcher 2" Reveal

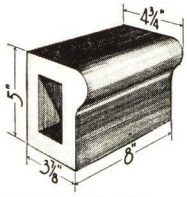


D50 Cove Stretcher

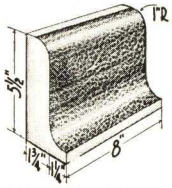
GROUP III SHAPES
Special Sill, Cap and Cove



D260 Slope Sill, 4" Reveal

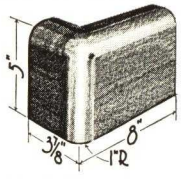


D40M Cap Stretcher, 4" Reveal

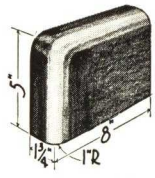


D520 Round Top Cove Stretcher
(Corners and Starters for this shape—Group V)

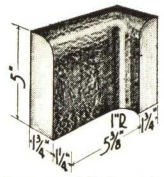
GROUP IV SHAPES



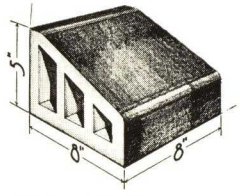
D24BR Soap, Bn. Sill Bn. Corner, 4" Ret., Rt.
D22BR Soap, Bn. Sill Square Cor., 4" Ret., Rt.



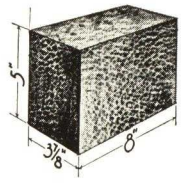
D24AR Soap, Bn. Sill Bn. Corner, 2" Ret., Rt.
D22AR Soap, Bn. Sill Square Cor., 2" Ret., Rt.



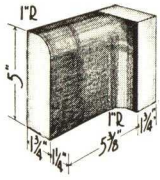
D28L Bullnose Sill, Coved Internal Corner, Left



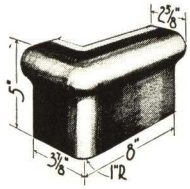
D8260 Slope Sill, 8" Reveal
D6260 Slope Sill, 6" Reveal



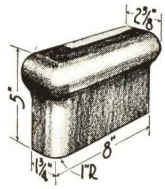
D12R Square Sill Quoin, Right



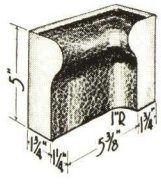
D208AL Soap, Bullnose Coping Starter, Left



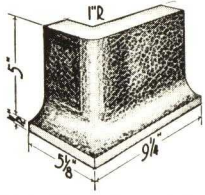
D44R Cap, Bullnose Corner, Right
D42R Cap, Square Corner, Right



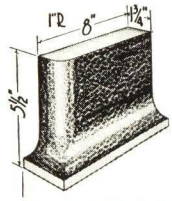
D44AR Soap Cap, Bn. Corner, 2" Return, Rt.
D42AR Soap Cap, Square Corner, 2" Ret. Right



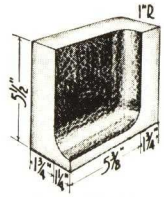
D48L Cap, Coved Internal Corner, Left



D54R Cove Bullnose Corner, Right
D52R Cove Quoin (Sq.) Corner, Right

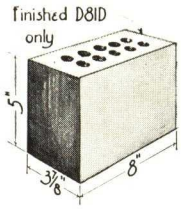


D54AR Soap, Cove Bullnose Corner, Right
D52AR Soap, Cove Quoin (Square) Corner, Right

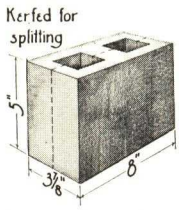


D58L Cove, Coved Internal Corner, Left

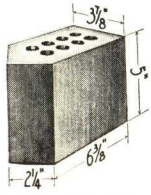
An extra charge is made for cutting lengths or heights other than those shown or listed. An electrically driven saw should be used for all cutting on the job.



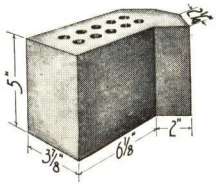
D81 Header
D81D Two Face Header



DV Kerfed Conduit Stretcher



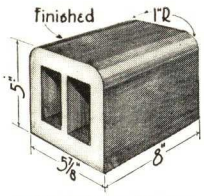
D6 External Octagon
D6A Same, Soap



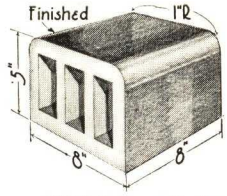
D9 Internal Octagon
D9A Same, Soap

GROUP III SHAPES

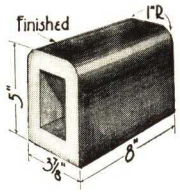
Copings and Two Face Wall Ends



D620D Bullnose Coping, 6" Wall
D610D Square Coping, 6" Wall

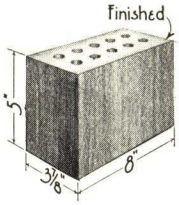


D820D Bullnose Coping, 8" Wall

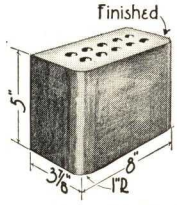


D20D Bullnose Coping, 4" Wall
D10D Square Coping, 4" Wall

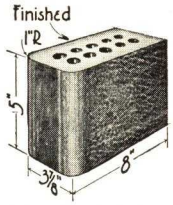
Above Shapes Also Used As Lintels



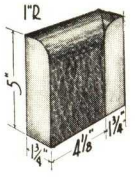
D83H Quoin (Square) End, 8" Wall



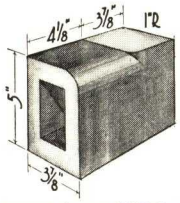
D85H Bullnose End, 8" Wall



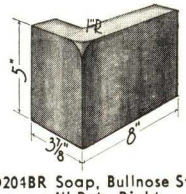
D5 Bn. End, 4" Wall
D5H Same, Half
D3 Quoin (Square) End, 4" Wall
D3H Same, Half



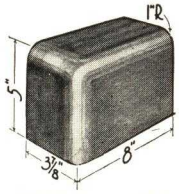
D27L Bullnose Sill, Internal Square Corner, Left



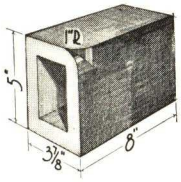
D31R Bullnose Sill Miter, Right



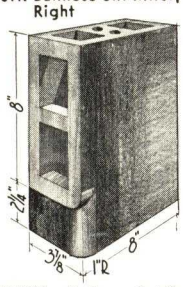
D204BR Soap, Bullnose Starter, 4" Ret., Right
(Used with slope sills)
D204AR Same, 2" Return



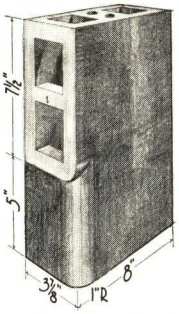
D24R Bullnose Sill, Bullnose Corner, Right
D22R Bullnose Sill, Quoin (Sq.) Corner, Rt.



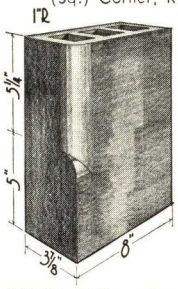
D30R Bullnose Miter, Right
D30AR Same, Soap



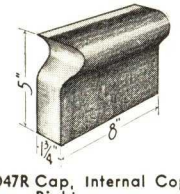
D34WR Bullnose Soldier Lintel Miter, Right
D34WAR Same, Soap 2" Return



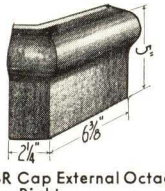
D34UR Bn. Soldier Lintel Universal Miter, Right
D34URA Same, Soap, 2" Return



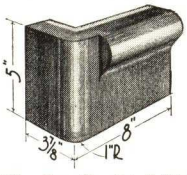
D34GR Bullnose Jamb Miter, Right
(Used with slope sills)
D34GAR Same, Soap, 2" Return



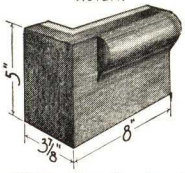
D47R Cap, Internal Coped, Right



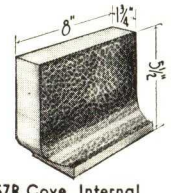
D46R Cap External Octagon, Right
D49L Cap Internal Octagon, Left (For Hor. Dim. see D59L)



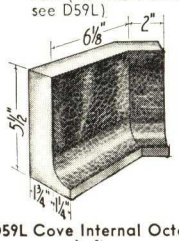
D404R Cap Starter, Bullnose, Right
D404AR Same, Soap, 2" Return



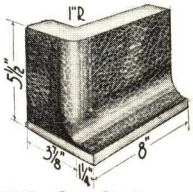
D402R Cap Starter, Quoin (Square) Right
D402AR Same, Soap, 2" Return



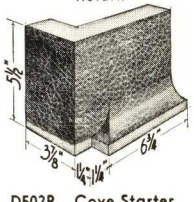
D57R Cove, Internal Coped, Right



D59L Cove Internal Octagon, Left
D56R Cove External Octagon, Right (For Hor. Dim. see D46R)

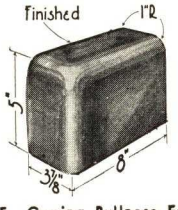


D504R Cove Starter, Bullnose, Right
D504AR Same, Soap, 2" Return

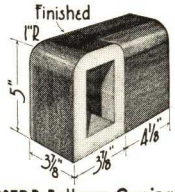


D502R Cove Starter, Quoin (Sq.), Right
D502AR Same, Soap, 2" Ret.

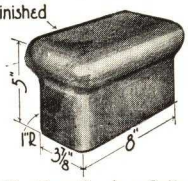
GROUP V SHAPES



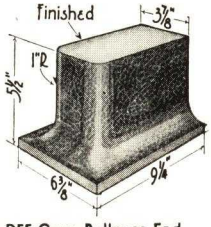
D25 Coping Bullnose End, 4" Wall
D25H Same, Half
D13 Square Coping End



D207DR Bullnose Coping Corner, 4" Wall, Right
D45H Same, half



D45 Cap Coping, Bullnose End, 4" Wall
D45H Same, Half

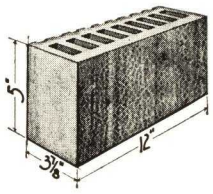


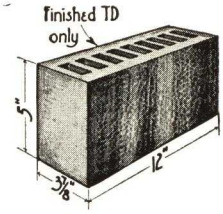
D55 Cove Bullnose End, 4" Wall

Nominal dimensions are usually given for returns, reveals, lengths, etc.; 2" is actually 1¾" 4" is actually 3⅞" and 6" is actually 5⅞". For complete explanatory notes see Page 23.

SERIES "T" 5"x12" FACE • • THREE BRICK EQUIVALENT UNITS

STRETCHER GROUP

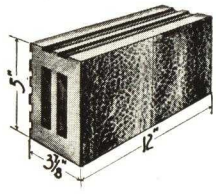


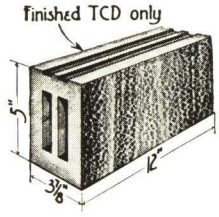


T-STRETCHERS

Tgr Stretcher, Scored Back

Tsm Stretcher, Smooth Back
TD Two Face Stretcher

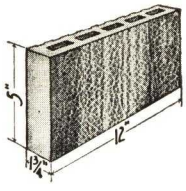




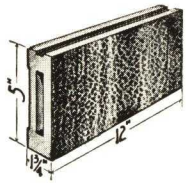
TC-STRETCHERS

TCgr Stretcher, Scored Back

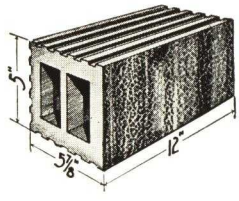
TCsm Stretcher, Smooth Back
TCD Two Face Stretcher



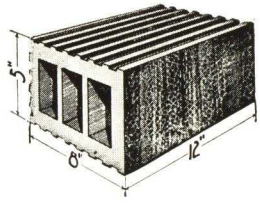
TA Soap Stretcher



TCA Soap Stretcher



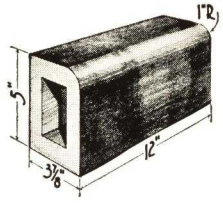
T60 6" Bond Stretcher
(Not furnished with Smooth Back or Two Face)



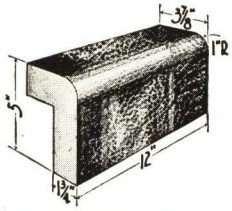
T80 8" Bond Stretcher
(Not furnished with Smooth Back or Two Face)

Unless job conditions require either SMOOTH or SCORED BACK STRETCHERS, shipment may be facilitated by ordering T-Stretchers, thereby permitting manufacturer to ship either the scored or smooth back stretchers or a mixture. Type and direction of SCORING and CORING are optional with each manufacturer. In general, each manufacturer standardizes on either the horizontal or vertical coring and does not supply both.

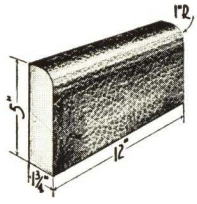
GROUP II SHAPES—Sill, Cap and Cove Stretchers



T20 Bullnose Sill
T10 Square Sill

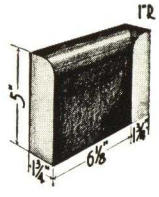


T20B Soap, Bullnose Sill, 4" Reveal

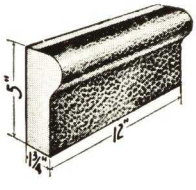


T20A Soap, Bullnose Sill 2" Reveal

GROUP IV SHAPES

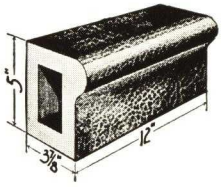


T27L Bullnose Sill, Internal Square Corner, Left

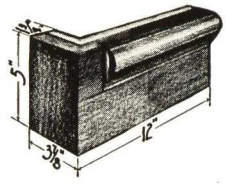


T40 Cap Stretcher
2" Reveal

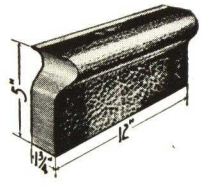
GROUP III SHAPES
Special Cap and Cove



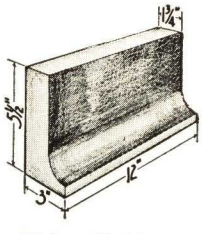
T40M Cap Stretcher, 4" Reveal



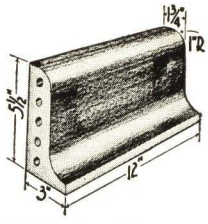
T402R Cap Starter, Quoin (Square) Corner, Right
T402AR Same, Soap, 2" Ret.



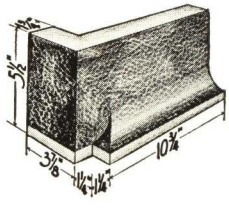
T47R Cap, Internal Coped, Right



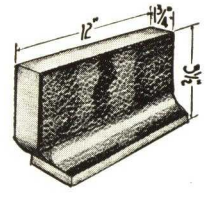
T50 Cove Stretcher



T520 Round Top Cove
(Corners and Starters furnished for this shape —Group V)



T502R Cove Starter, Quoin (Square) Corner, Right
T502AR Same, Soap, 2" Ret.

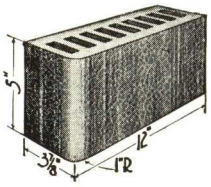


T57R Cove, Internal Coped Right

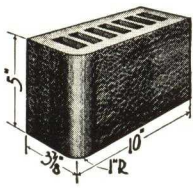
An extra charge is made for cutting lengths or heights other than those shown or listed.
An electrically driven saw should be used for all cutting on the job.

SERIES "T" 5"x12" FACE • • THREE BRICK EQUIVALENT UNITS

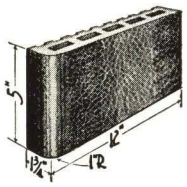
GROUP I SHAPES



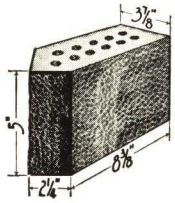
T4 Bullnose Jamb
T4H Same, Half
T2 Quoin (Square) Jamb
T2H Same, Half



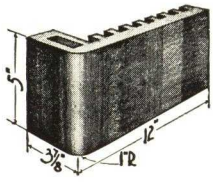
TG4 Bullnose Corner



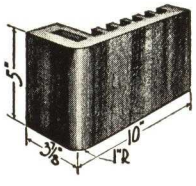
T4A Soap, Bullnose Jamb, 2" Return
T2A Soap, Quoin (Square) Jamb, 2" Return



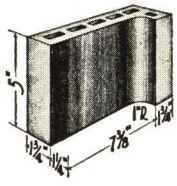
T6 External Octagon
T6A Same, Soap



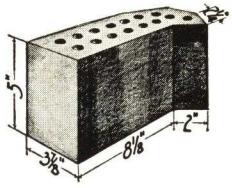
T4B Soap, Bullnose Jamb, 4" Return
T2B Soap, Quoin (Square) 4" Return



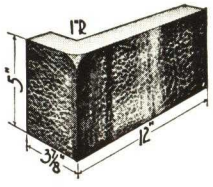
TG4B Soap, Bullnose Corner 4" Return



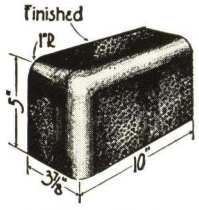
T8 Coved Internal Corner



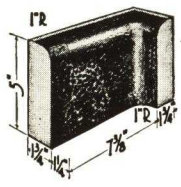
T9 Internal Octagon
T9A Same, Soap



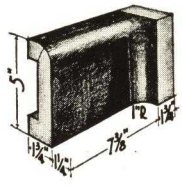
T204BR Soap, Bullnose Starter, Right (Used with Slope Sills)



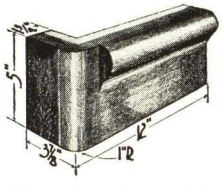
TG24R Bullnose Sill, Bullnose Corner, Right
TG24BR Same, Soap, 4" Return
T24HR Bullnose Sill, Bullnose Corner, Right, 6" Long
T22HR Bullnose Sill, Quoin (Sq.) Corner, Rt., 6" Long



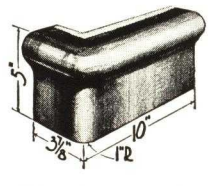
T28L Bullnose Sill, Coved Internal Corner, Left



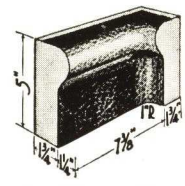
T208AL Soap, Bullnose Coping Starter, Left



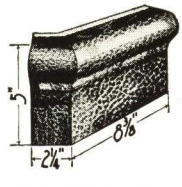
T404R Cap Starter, Bullnose Corner, Right
T404AR Same, Soap, 2" Return



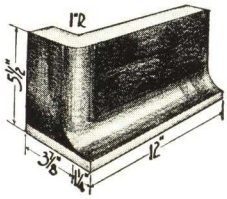
TG44R Cap, Bn. Corner, Rt.
T44HR Same, 6" Long
T42HR Cap, Quoin (Sq.) Corner, Right, 6" Long



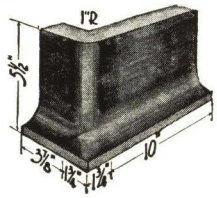
T48L Cap, Coved Internal Corner, Left



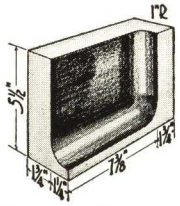
T46R Cap, External Octagon, Right
T49L Cap, Int. Octagon, Left. (For horizontal Dimensions see T59)



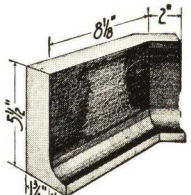
T504R Cove Starter, Bullnose, Right
T504AR Same, Soap, 2" Ret.



TG54R Cove, Bullnose Corner, Right
T54HR Same, 6" Long
T52HR Cove, Quoin (Sq.) Corner, Right 6" Long



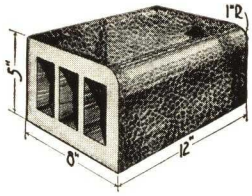
T58L Cove, Coved Internal Corner, Left



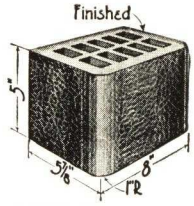
T59L Cove, Internal Octagon, Left
T56R Cove, External Octagon, Right
(For hor. dim. see T46)

Nominal dimensions are usually given for returns, reveals, lengths, etc.; 2" is actually 1¾". 4" is actually 3⅞" and 6" is actually 5⅞". For complete explanatory notes, see Page 23.

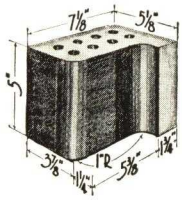
GROUP III SHAPES—Two Face Wall Ends, Copings and Specials



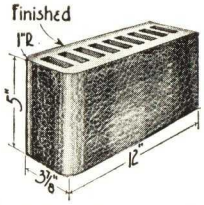
T820 Bullnose Sill, 8" Reveal
T810 Square Sill, 8" Reveal



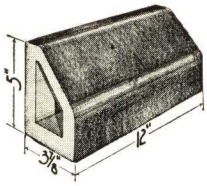
T85H Bullnose End, 8" Wall
T83H Quoin (Square) End, 8" Wall



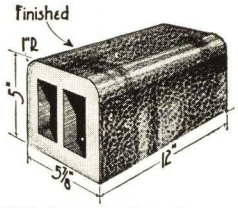
T38 Bullnose and Coved Corner
T38A Same, Soap, 2" Bullnose Return



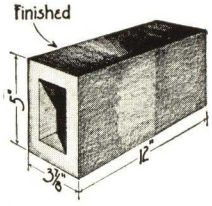
T5 Bullnose End, 4" Wall
T5H Same, Half
T3 Quoin (Sq.) End, 4" Wall



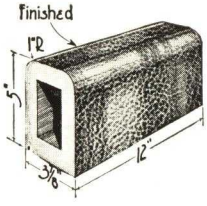
T260 Slope Sill



T620D Bullnose Coping, 6" Wall
T610D Square Coping, 6" Wall

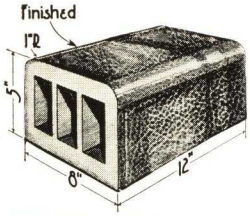


T10D Square Coping, 4" Wall

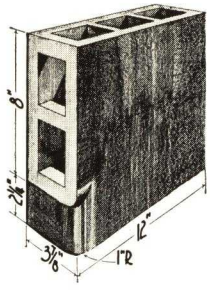


T20D Bullnose Coping, 4" Wall

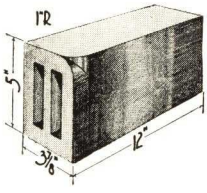
GROUP IV SHAPES



T820D Bullnose Coping, 8" Wall
T810D Square Coping, 8" Wall

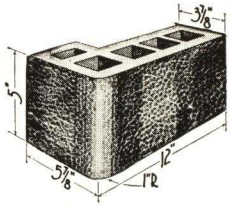


T34WR Bullnose Soldier Lintel Miter, Right
T34WAR Same, Soap, 2" Return

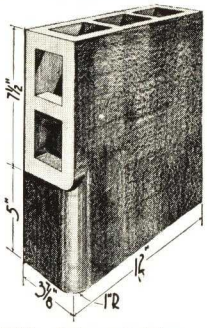


T30R Bullnose Miter, Right
T30AR Same, Soap, 2" Return

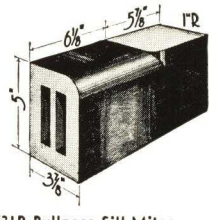
GROUP II SHAPES



T4N Bullnose Corner, 6" Return
T4E Same, Soap
T2N Square Corner, 6" Return
T2E Same, Soap

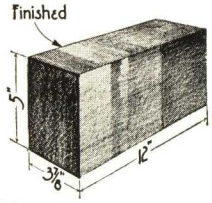


T34UR Bullnose Soldier Lintel, Universal Miter, Right
T34UAR Same, Soap, 2" Return

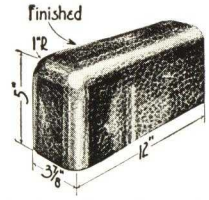


T31R Bullnose Sill Miter, Right

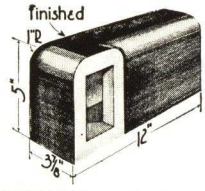
GROUP V SHAPES



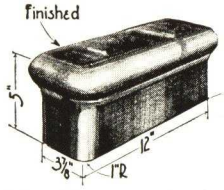
T13 Square Coping End, 4" Wall



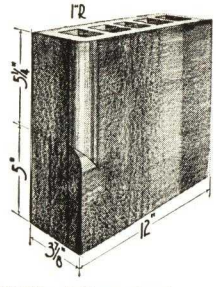
T25 Bullnose Coping, Bullnose End, 4" Wall
T25H Same, Half



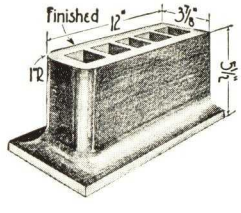
T207DR Bullnose Coping Corner, 4" Wall, Right



T45 Cap Coping, Bullnose End, 4" Wall
T45H Same, Half



T34GR Bullnose Jamb Miter, Right
(Used with slope sills)
T34GAR Same, Soap, 2" Return



T55 Cove, Bullnose End 4" Wall
T55H Same, Half

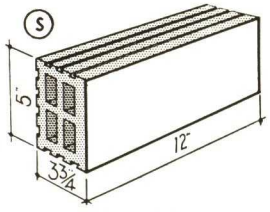
An extra charge is made for cutting lengths or heights other than those shown or listed.
An electrically driven saw should be used for all cutting on the job.

FACE TILE SHAPE DETAILS AND SIZES

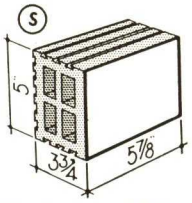
"3H"-"3A" SERIES - 5" x 12" FACE — "2H"-"2A" SERIES - 5" x 8" FACE

NATIONAL STANDARDIZATION - BRICK AND TILE SHAPES

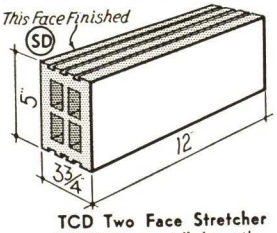
5" x 12" FACE (3BE) LIGHT WEIGHT SERIES



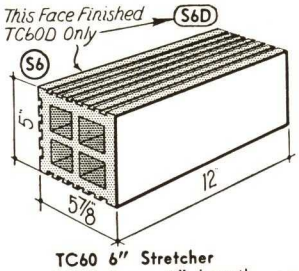
TC Stretcher



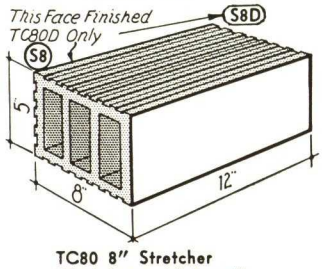
TC1 Stretcher 6" Length



TCD Two Face Stretcher
TC1D Same, 6" Length

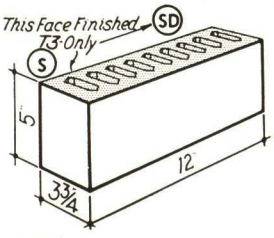


TC60 6" Stretcher
TC61 Same, 6" Length
TC60D Two Face 6" Str.
TC61D Same, 6" Length

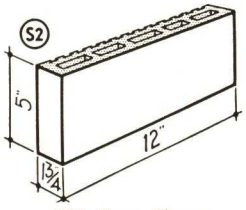


TC80 8" Stretcher
TC81 Same, 6" Length
TC80D Two Face 8" Str.
TC81D Same, 6" Length

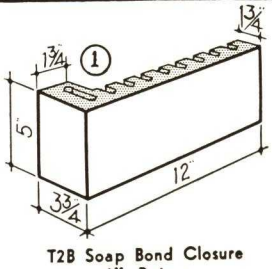
5" x 12" FACE (3BE) HEAVY WEIGHT SERIES



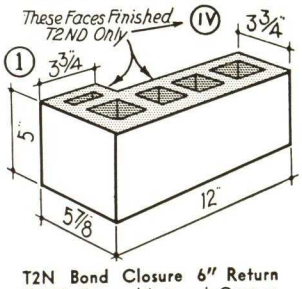
T2 Closure
T2H Half Closure
T3 Two Face Closure
T3H Same, 6" Length



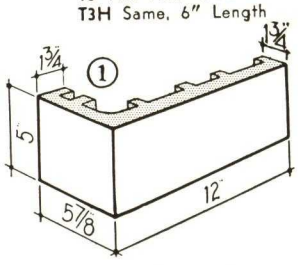
T2A Soap Closure
2" Return



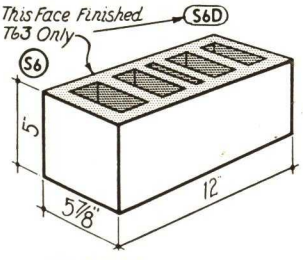
T2B Soap Bond Closure
4" Return



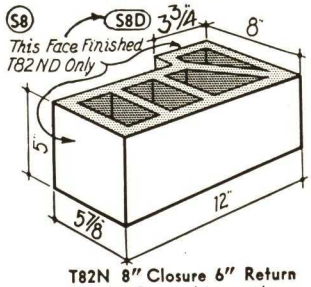
T2N Bond Closure 6" Return
T2ND External-Internal Corner
(4" Wall)



T2E Soap Bond Closure 6" Return

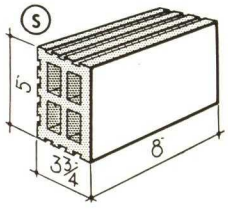


T62 6" Closure
T63 Two Face 6" Closure
T63H Same, 6" Length

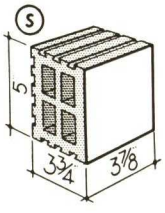


T82N 8" Closure 6" Return
T82ND External-Internal
Corner (8" Wall)

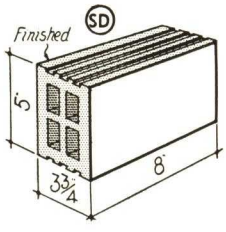
5" x 8" FACE (2BE) LIGHT WEIGHT SERIES



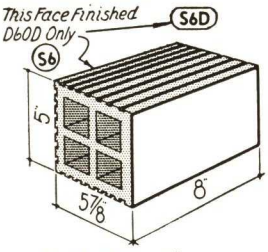
DC Stretcher



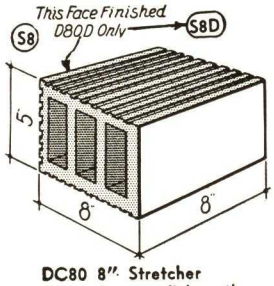
DC1 Stretcher 4" Length



DCD Two Face Stretcher
DC1D Same, 4" Length

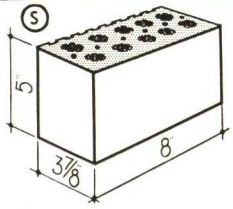


DC60 6" Stretcher
DC61 Same, 4" Length
DC60D Two Face 6" Str.
DC61D Same, 4" Length

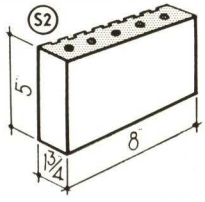


DC80 8" Stretcher
DC81 Same, 4" Length
DC80D Two Face 8" Str.
DC81D Same, 4" Length

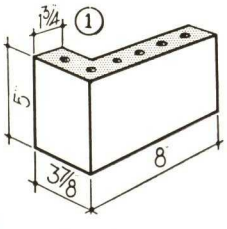
5" x 8" FACE (2BE) HEAVY WEIGHT SERIES



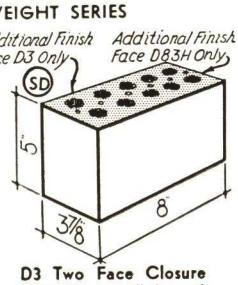
D2 Closure
D2H Same, 4" Length



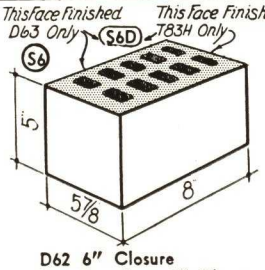
D2A Soap Closure
2" Return



D2B Soap Bond Closure
4" Return



D3 Two Face Closure
D3H Same, 4" Length
D83H Two Face 8" Closure
4" Length



D62 6" Closure
D63 Two Face 6" Closure
D63H Same, 4" Length
T83H Two Face 8" Closure
6" Length

NOTE: Any Brictile or Tribric Shape will be furnished unglazed except cove and cap shapes.

See Accompanying Notes for Explanation of Class Symbols, Shape Numbers, Scoring and Coring, Finished Faces, Fractional Lengths, Quoins, Returns, Reveals, Variants, Tolerances and Other Explanatory Notes.

GUARANTEE OF THE GLAZED BRICK AND TILE INSTITUTE MEMBERS

Each member of the Glazed Brick & Tile Institute guarantees that any ware manufactured by him will conform to the quality standards, tolerances and grading rules as published herein. If it can be established within reasonable time, but in no event longer than one year, that any material does not conform to these standards, the manufacturer will replace defective units. The measure of damage after ware has been installed will be the replacement of defective units without charge at the factory, and no charge for labor or other expenses required to repair defective ware or damage occasioned by it will be allowed.

In no event will replacement of B or C Grades be made after installation. No replacement will be made of ware chipped on job or after installation, nor when used in service for which not recommended.

CONSTRUCTION DETAILS

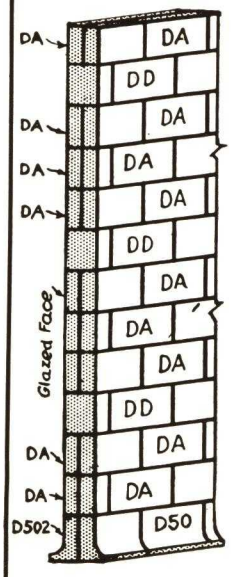
Upon the following pages will be found structural designs for all types of Stark products. Typical details of bonding for various wall thicknesses and conditions are shown below. Use of two bonded units is recommended for two faced partitions.

Face tile detail on the opposite page shows sills, jambs, lintels and other structural layouts. Details and specifications for laying Sanitary Floor Brick are also shown, which we find very helpful to architects and contractors.

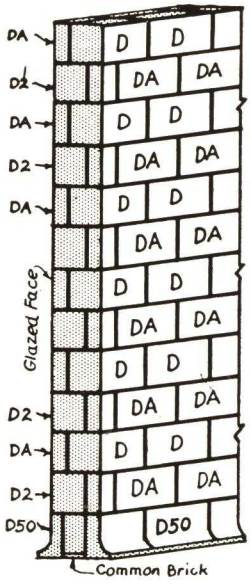
In exterior construction, water at times gets into the masonry through defective or improper coping and flashing or leaky joints caused by improper mortars. This water will work down through the walls and in freezing weather may cause great damage for which the manufacturer can be in no way responsible.

Extensive research has been made by various agencies as to proper and correct coping, flashing, and mortars for practically any condition. These researches are set forth in pamphlet form by the various agencies conducting the tests and are available upon application.

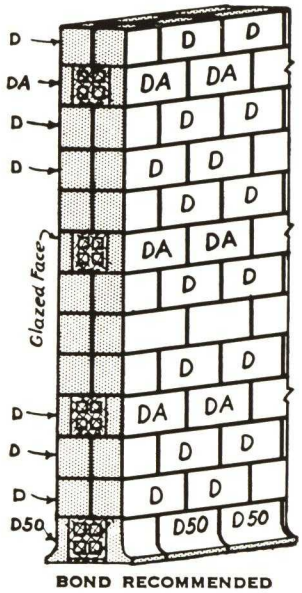
CONSTRUCTIONAL DETAILS — BRICK AND FLATTER



4" TWO FACE

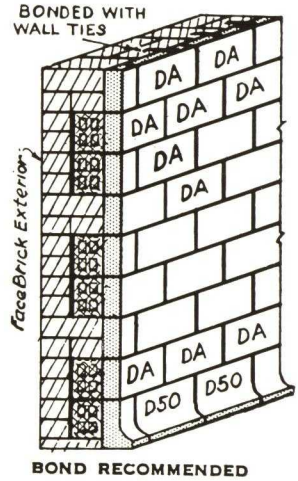


6" TWO FACE



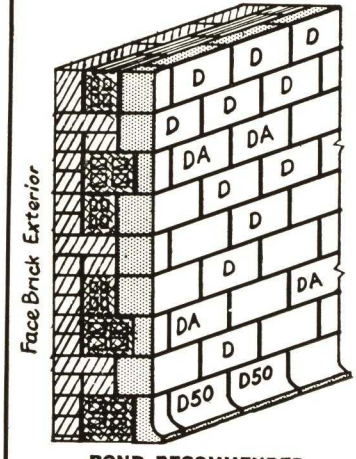
BOND RECOMMENDED

8" TWO FACE
BONDED WITH BACKUP TILE



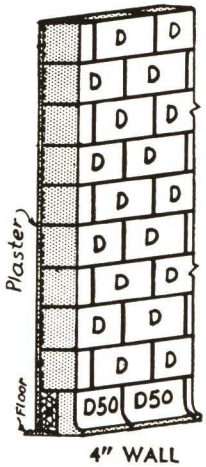
BOND RECOMMENDED

8" WALL FURRED TO 10" WITH SOAP TILE

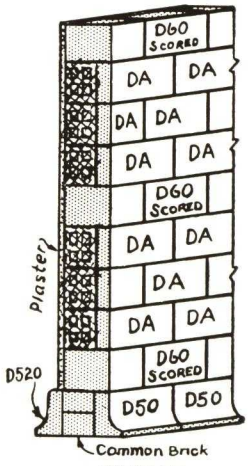


BOND RECOMMENDED

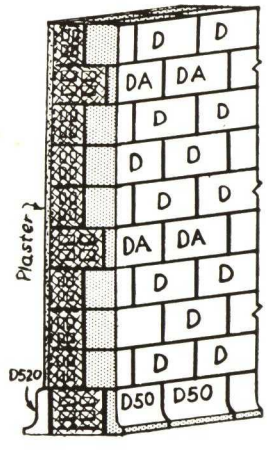
12" WALL FACED



4" WALL
PLASTERED ONE SIDE

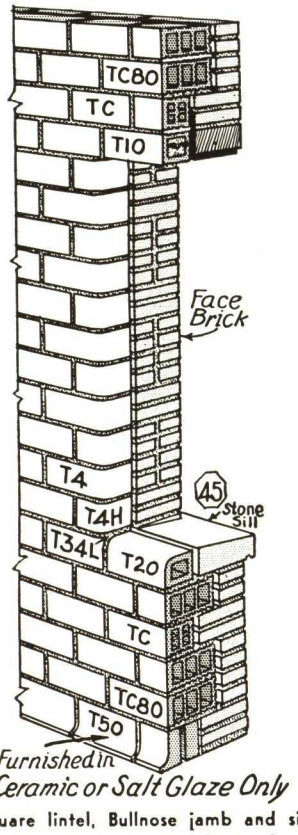


6" WALL
PLASTERED ONE SIDE

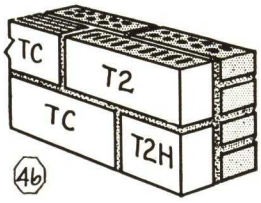


8" WALL PLASTERED ONE SIDE

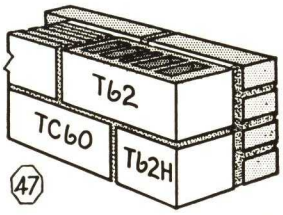
CONSTRUCTIONAL DETAILS — FACE TILE



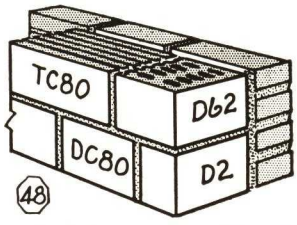
Square lintel, Bullnose jamb and sill, cove base.



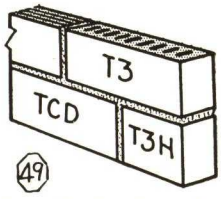
Jamb for one face 8" wall.



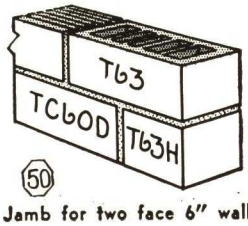
Jamb for one face 10" wall.



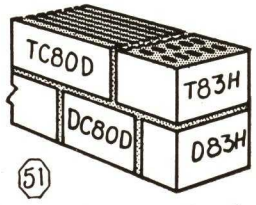
Jamb for one face 12" wall.



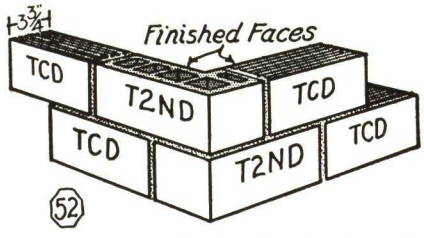
Jamb for two face 4" wall.



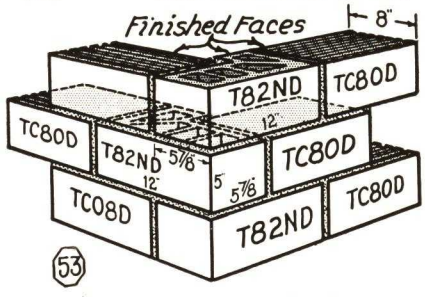
Jamb for two face 6" wall.



Jamb for two face 8" wall.



Corner for two face 4" wall.



Corner for two face 8" wall.

See Accompanying Notes for Explanation of Class Symbols, Shape Numbers, Scoring and Coring, Finished Faces, Fractional Lengths, Quoins, Returns, Reveals, Variants, Tolerances and Other Explanatory Notes.

CONSTRUCTIONAL DETAILS — GENERAL

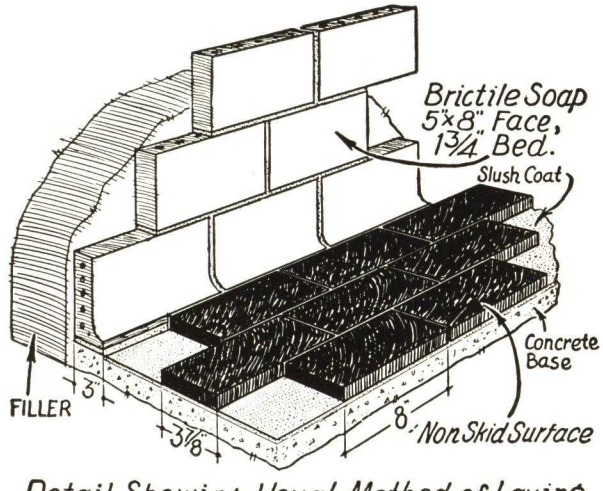
LAYING DETAILS FOR FLOOR BRICK

The most important factor in laying a floor with our Sanitary Floor Brick is to tamp the brick well and to continue the work and finish the grouting before leaving the job to set. If the brick are tamped down for a certain area, they should not be allowed to stand overnight, but filled in with grouting before leaving the work.

The bed of concrete varies from 1" to 3", depending on the pitch required. For a bed 1" thick, use one part of cement to two parts of torpedo sand. For a bed 2" thick, use one part of cement to two and one-half parts sand. For a 3" bed, one part of cement to three parts sand. This mixture should be quite dry and have just enough water to make it workable. As the brick are tamped down, the water will come to the surface and help to cement the brick firmly to the bed. No part of this cement is allowed to form any part of the joints and brick are laid as closely as possible.

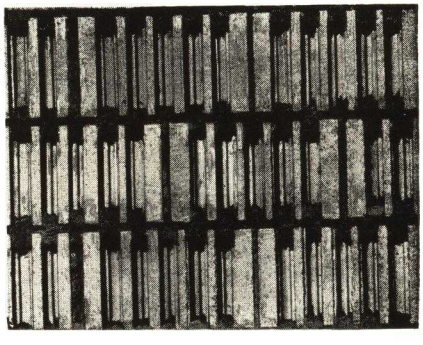
The grouting is then applied, which is composed of very fine, or reground Portland Cement and water. The joints are filled thoroughly before the job is allowed to stand and usually the surface must be worked over several times with a squeegee before the joints are filled. Additional water may be added to the grouting as required.

SHAPES. Any *Brictile* Shape will be furnished burned to match floor brick.



Detail Showing Usual Method of Laying Sanitary Floor Brick

BONDING STRENGTH OF STARK PRODUCTS



The illustration shows a section of a Stark *Brictile* wall cut back to the first row of holes. The bonding strength of the wall is reinforced by a second row of vertical holes behind these.

When the mortar is spread, a portion of it first works downward into the holes below, the extent of which is seen in this illustration. As the next row of *Brictile* is placed, a portion of the mortar is forced upward into the holes above. The location of the holes permits the use of reinforcing rods, if desired, for free standing walls. After mortar sets, this wall is one solid unit. (Brick, *Brictile, Tribric,* and *Flatters* have the same bonding advantages).

SUPER POOLS OF BEAUTY BY STARK

The refinement and elegance of Stark's colorglaze brick is reflected in swimming pools of modern architectural design. Stark Super Pools not only provide utility and efficiency, but with their beauty of color and design are truly a work of art.

The inherent qualities of the glazed finish make our units especially adaptable for pool construction, because of its sanitation, and ease of cleaning and maintenance.

Sturdy ladder sections are designed with rounded exposed corners and bond perfectly into the side walls. Each ladder section is provided with drain outlet.

Neatly designed scum gutter at the water line offers a hand hold to swimmers; they are very attractive, efficient and easily cleaned. Special sections are made to fit any type of drain outlet.

Large block letters and numbers are available to mark the Deep and Shallow end of pool. The numbers are used as the lane and distance markers.

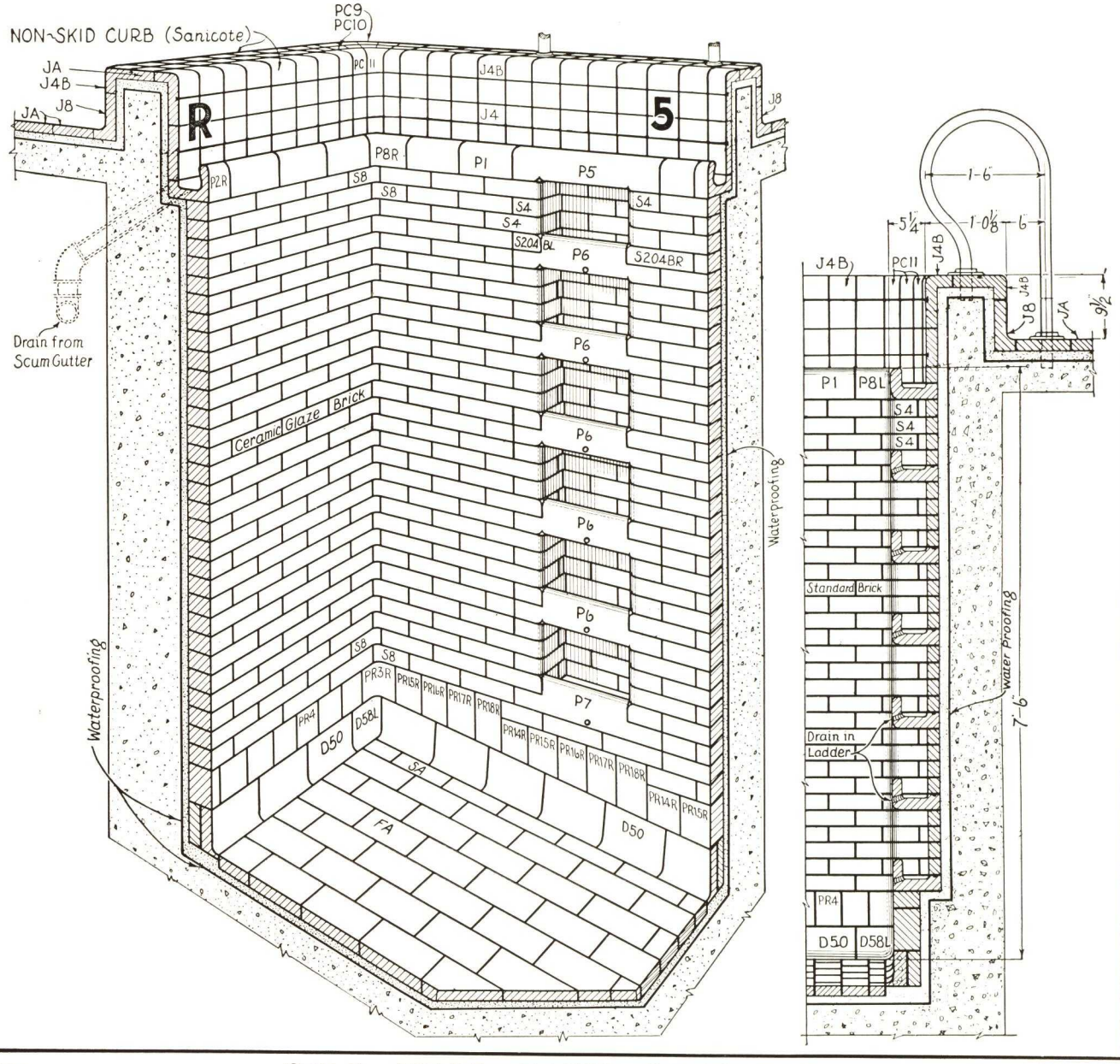
The letters, numbers, also cove base and lane markers are usually assembled in black. This adds decoration to the appearance of the pool and serves as a guide to the swimmers.

Non-skid tile curbing and adjoining floors are Sanicote (See description on page 4) with a false mortar joint separating the units in squares. When pointed up, these units have the appearance of square tile. The Sanicote feature will serve as a safety measure and the false mortar joint cuts down the cost considerably without detracting from the inherent beauty of Stark Pools.

All special shapes including the rake above the cove base are factory cut and come marked ready for installation, which naturally lowers the cost of Stark Pools

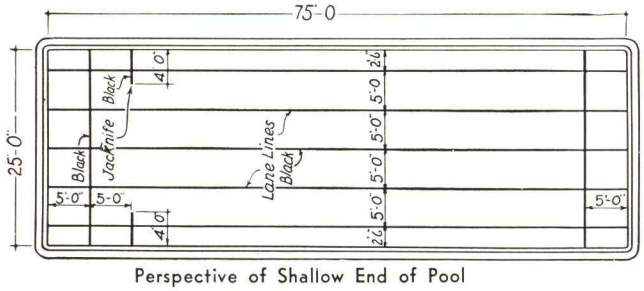
A quantity schedule of material and unit price supplied upon application. A complete set of erection drawings furnished with each pool order.

PERSPECTIVE OF DEEP END OF POOL

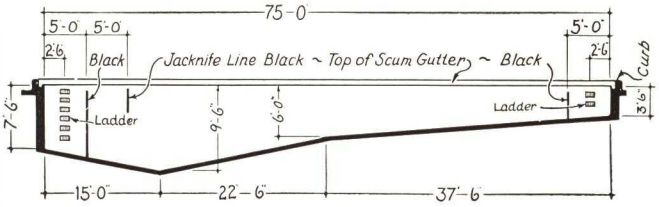


SWIMMING POOL DETAILS

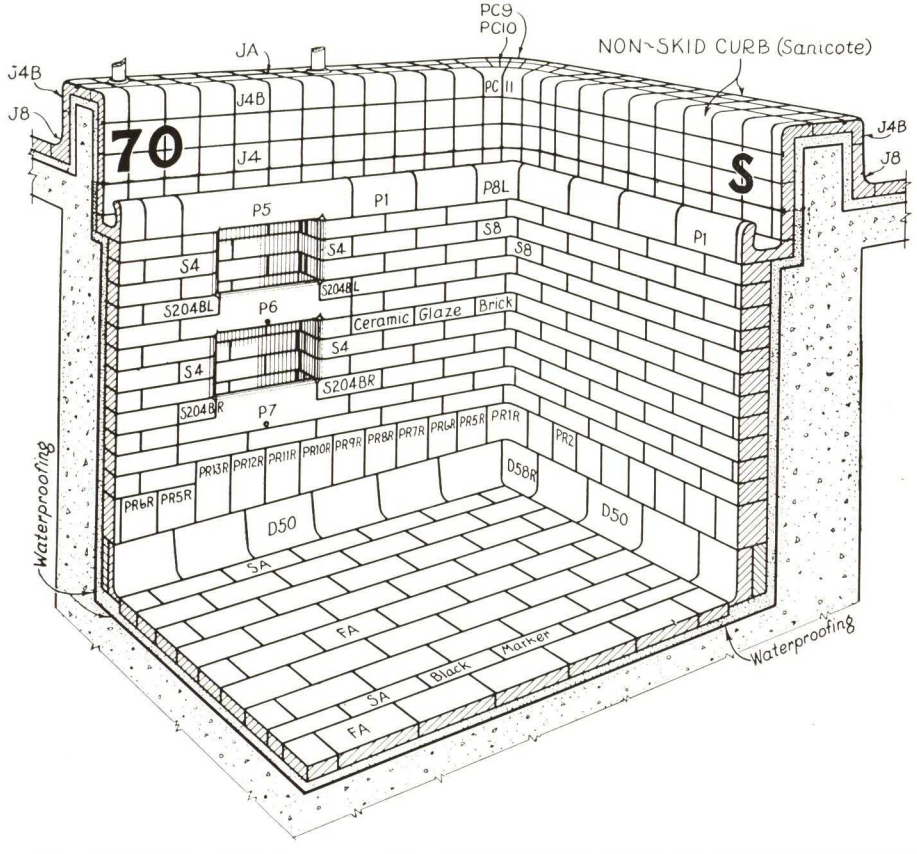
Top Plan View



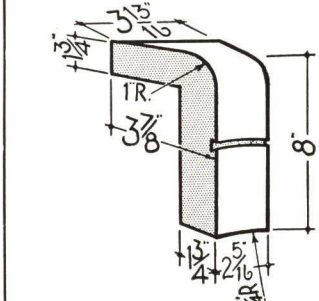
Longitudinal Section



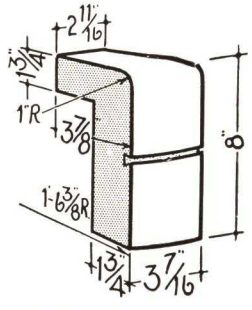
Perspective of Shallow End of Pool



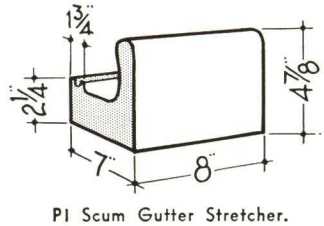
Pool Shape Details



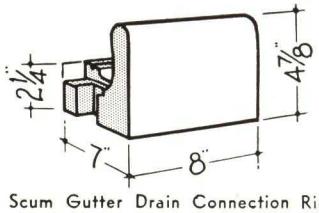
PC11 Curb Internal Radial



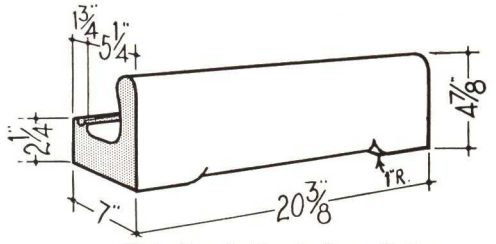
PC9 Curb External Radial



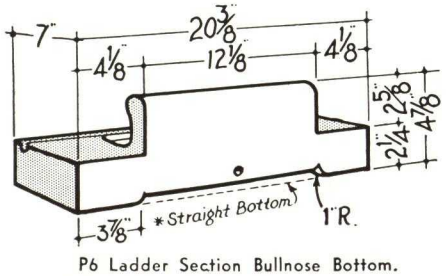
P1 Scum Gutter Stretcher.



P2R Scum Gutter Drain Connection Right

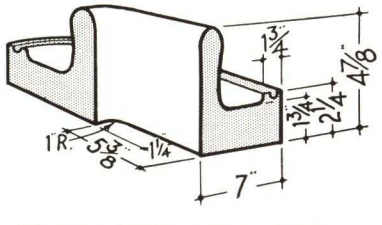


P5 Ladder Section in Scum Gutter.

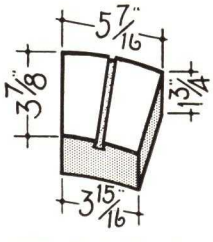


P6 Ladder Section Bullnose Bottom.

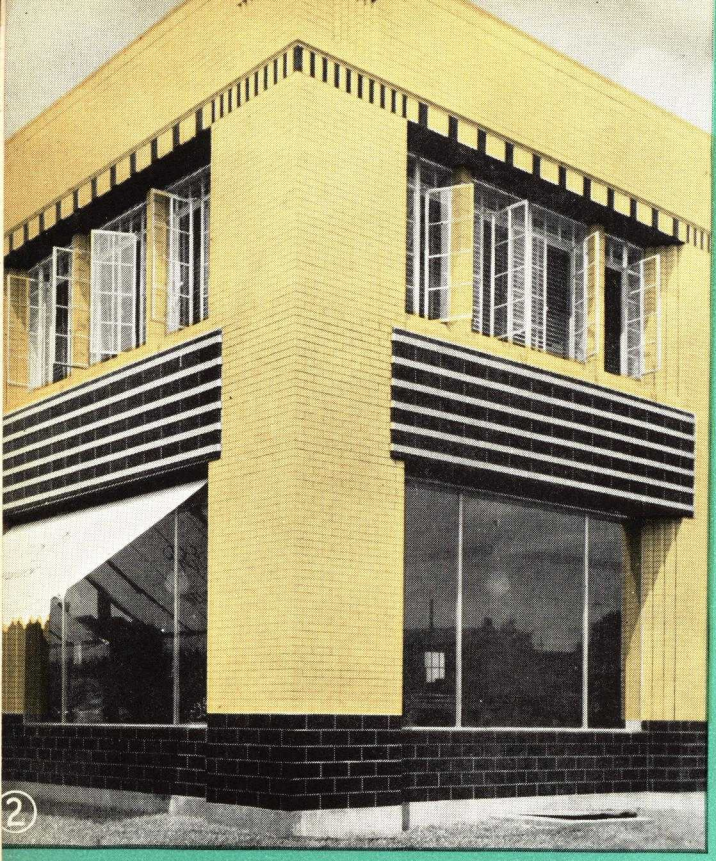
* P7 Ladder Section Straight Bottom.

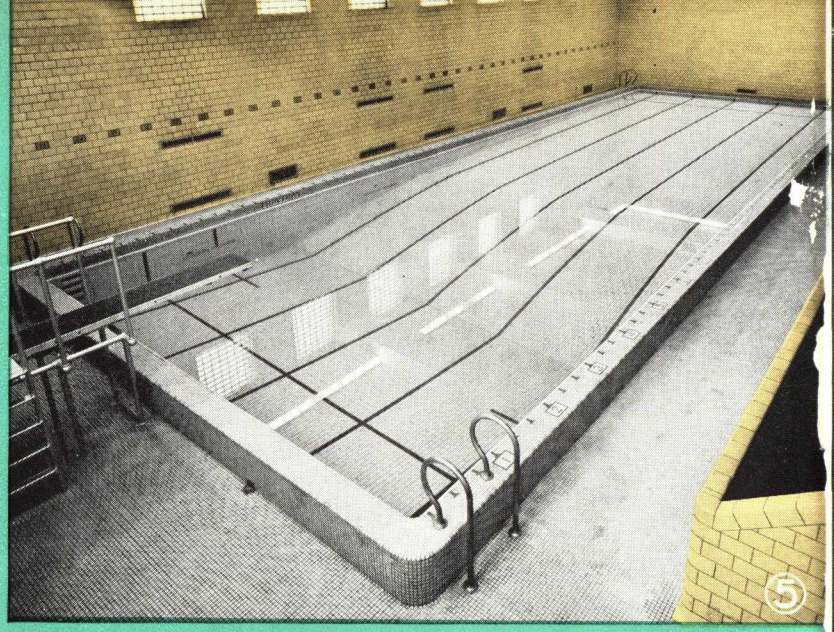


P8R Internal Bullnose Scum Gutter.



PC10 Curb Top Radial





EXIT

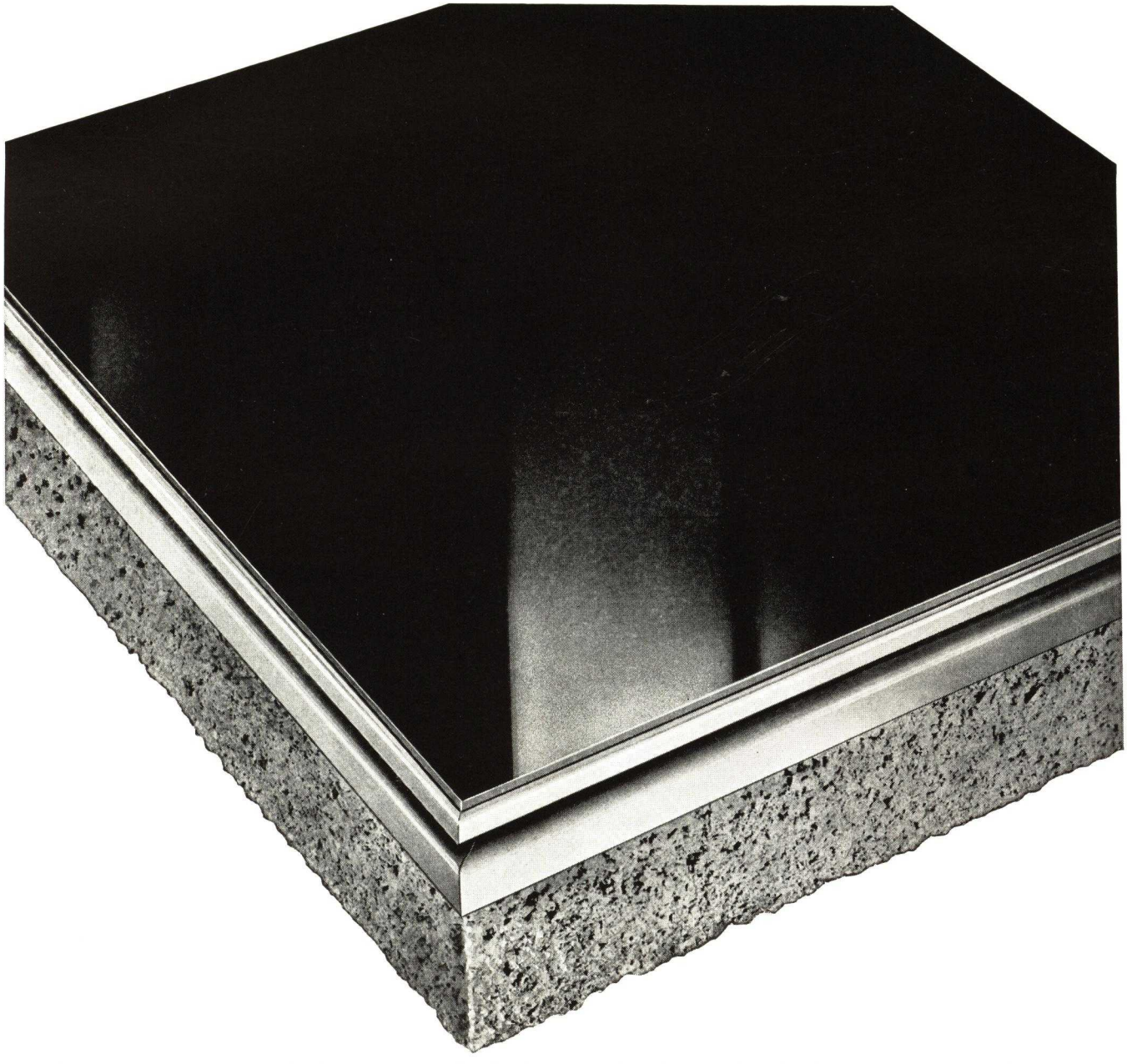
LIBBEY·OWENS·FORD GLASS COMPANY

TOLEDO, OHIO

FOR COMPLETE DETAILS SEE FILE INDEX

GLASTONE

THE NEW LOAD-BEARING, COLORFUL MASONRY UNIT

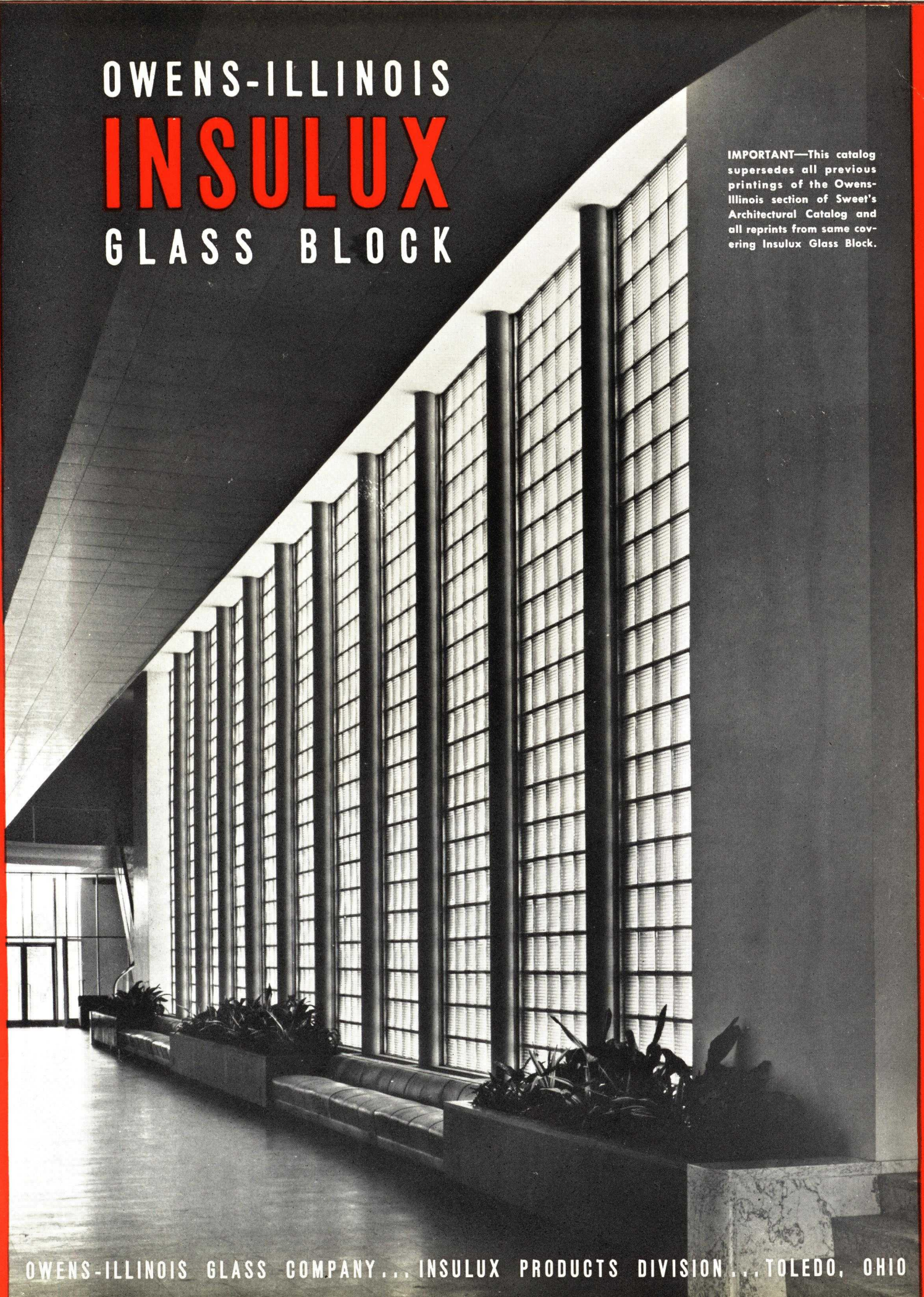


Glastone is a specially prepared, lightweight concrete slab to which a permanent facing of Vitrolite Structural Glass is bonded and mechanically anchored. It meets the wide demand which exists today for colorful structural glass in a load bearing masonry unit to be built into and become an integral part of a building.

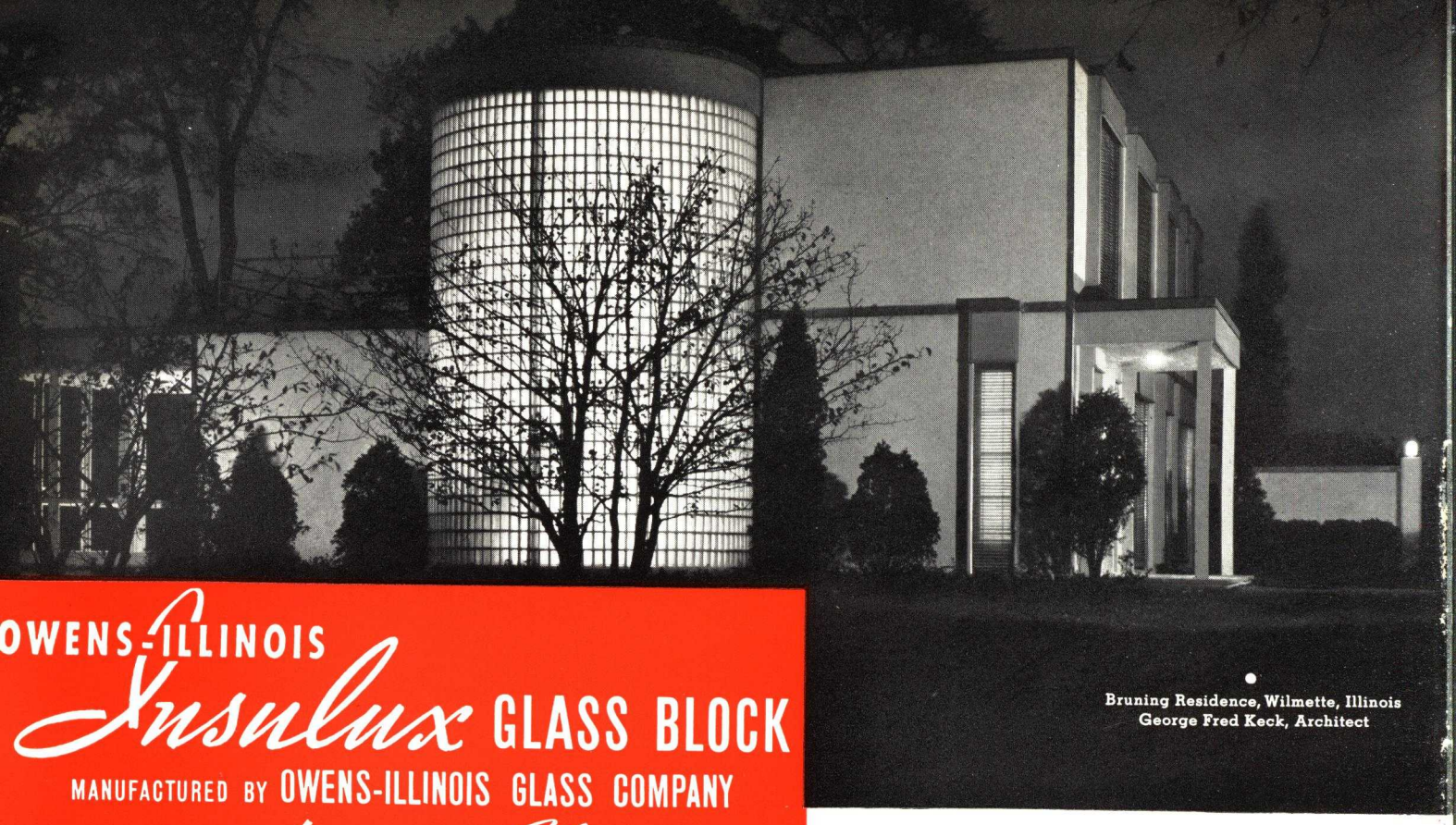
MEMORANDA

OWENS-ILLINOIS
INSULUX
GLASS BLOCK

IMPORTANT—This catalog supersedes all previous printings of the Owens-Illinois section of Sweet's Architectural Catalog and all reprints from same covering Insulux Glass Block.



OWENS-ILLINOIS GLASS COMPANY . . . INSULUX PRODUCTS DIVISION . . . TOLEDO, OHIO



Bruning Residence, Wilmette, Illinois
George Fred Keck, Architect

OWENS-ILLINOIS *Insulux* GLASS BLOCK

MANUFACTURED BY OWENS-ILLINOIS GLASS COMPANY

"First in Glass"

INSULUX is manufactured by the Owens-Illinois Glass Company, nation-wide glass manufacturer, producing one of the largest tonnages and greatest diversifications of glass made in the world today. Owens-Illinois has developed and perfected not only the idea of glass block but glass insulators, all types of glass containers, glass home insulation, glass filters for filtering dust, and a family of glass industrial insulations.

With a daily capacity of thousands of tons of glass and 65 years' experience in manufacturing glass for use exposed to weather and chemical reaction under every conceivable condition, Owens-Illinois has had an ideal background for its work in the glass block field.

As a result, INSULUX has been developed with its own special plant and its own special glass as one of the most practical and best engineered materials ever brought to the building field. A corps of staff architects and engineers has worked continuously with glass technicians to produce a product to meet the everyday practical problems which architects and engineers must solve for their clients. These Owens-Illinois architects and engineers after seven years are still a part of the Owens-Illinois staff, working for the further perfection of INSULUX.

More than fifty thousand actual installations give testimony of the success with which INSULUX has met the needs of modern architecture. It is this success, typical of a long history of successful development and production of glass products that establishes the phrase "First in Glass" as the appropriate slogan of the Owens-Illinois Glass Company.

INDEX

	Page
GENERAL DESCRIPTION	2, 3
FEATURES AND ADVANTAGES	4 to 7
Light, Transmission of	4
Thermal Insulation	5
Condensation, Elimination of	5
Solar Heat, Reduction of	5
Air Infiltration, Reduction of	6
Sound, Transmission of	6
Strength	6
Maintenance	7
Cleanliness, Sanitation	7
DESIGNS, SIZES, DESCRIPTION	8, 9
BLOCK DIMENSION TABLE	10
ERECTION PROCEDURE	10
DETAILS OF CONSTRUCTION	11 to 17
12-inch walls	11
Metal frames or 8-inch masonry walls	12
Long panels	13
Tall panels	14
Metal window frames	15
Metal door frames	16
Wood construction and interior partitions	16
Minimum laying radii, alternate details for small panels	17
SPECIFICATIONS	18, 19
TEST DATA	20 to 23
Compression • Conductivity • Condensation • Light Transmission and Diffusion • Moisture Penetration • Solar Heat Transmission • Sound Transmission • Strength (Tension—Shear—Compression) • Wind Resistance (Air Pressure)	

SERVICE TO ARCHITECTS

Owens-Illinois Glass Company maintains in its Architectural Department a well-qualified group of architects and engineers to check architects' glass block details, to provide architects with structural details for glass block construction and to supervise glass block construction on large jobs. *This service department does not function as an architect in competition with architects and does not prepare plans or sketches except as an aid to architects.*

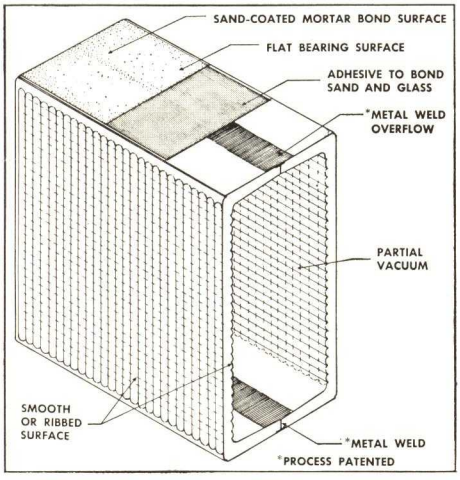
1B-2 Copyright 1938 Owens-Illinois Glass Company

OWENS-ILLINOIS *Insulux* A PRACTICAL BUILDING MATERIAL

USED TO TRANSMIT LIGHT...PROVIDE INSULATION...AND AS AN AID IN CREATING INTERESTING DESIGN

INSULUX—A HOLLOW GLASS BLOCK

Owens-Illinois Insulux is a hollow, partially evacuated block made of water-clear pressed glass. It is hermetically sealed at the time of manufacture, and is finished on the mortar-bearing surfaces with a gritty mortar bond. This permits it to be laid up in mortar to create attractive, light-transmitting panels with high insulating value. Insulux is translucent, but not transparent, and is highly resistant to the transmission of sound.



INSULUX—SERVES MANY USES

These basic features have made Insulux practical for virtually all types of construction. Industry uses Insulux for its light transmission, insulation value and low maintenance. Homes use it as a new design element, as a source of greater light without undue heat loss, and as a means of obtaining privacy—from view and noise. Commercial structures also use it as a design element, and as a means of obtaining interesting lighting effects to attract public patronage. Air-conditioned structures use it to provide light and beauty and to cut down the cooling load.

INSULUX—THE RESULT OF EXTENSIVE RESEARCH

Insulux is a proven, practical building material. It has been the object of extensive research both within the company and by outside, independent laboratories. Of interest to architects, is the fact that Insulux research has not only gone into the physical characteristics of the material itself, but also into its application and use under field conditions.

INSULUX—ERECTED BY BRICKLAYER OR MASON

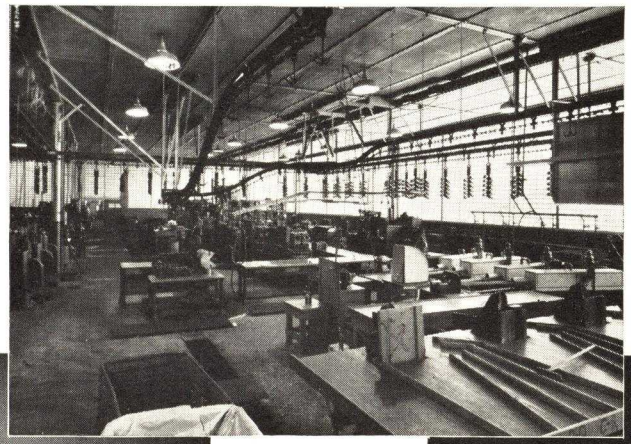
From this field experience has been developed the standard method of erection of Insulux Glass Block. It is laid up by the bricklayer or mason using a Portland cement-lime-sand mortar. Thus, it is handled by one of the oldest, most capable, and best established building trades.

INSULUX—SOLD BY DEALERS

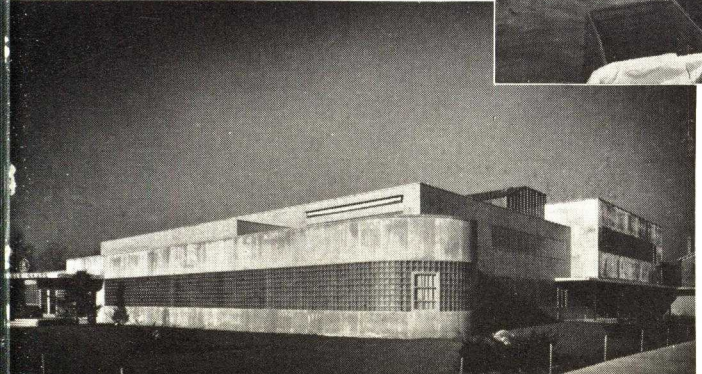
Insulux Glass Block is sold by dealers. It is stocked in different sizes and designs to permit efficient delivery service in any desired quantity.

INSULUX—STOCKED IN ALL PRINCIPAL MARKETS

Insulux dealers have been established in all principal markets. Many hundreds of them are located to provide efficient coverage. Each has a genuine interest in the success of Insulux and is ready to be helpful in any way he can to those who contemplate using it.



Temperature Control Chamber, Plymouth Division, Chrysler Corporation, Albert Kahn, Inc., Architect



Kimball Glass Company
Vineland, New Jersey
William Lescaze, Architect

Wieboldt Department Store
Oak Park, Illinois
Holabird & Root, Architects

SPECIAL FEATURES AND ADVANTAGES

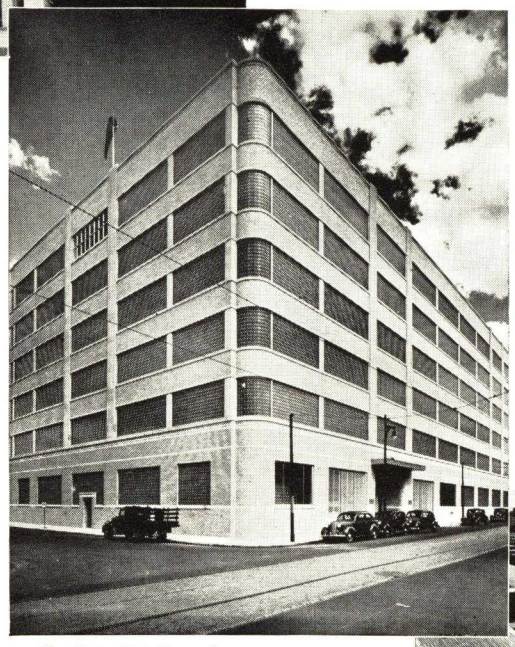
New York City Building
N. Y. World's Fair
Aymar Embury II, Architect

DESIGN

Because of its great flexibility in use, INSULUX Glass Block may be adapted to harmonize with most types of architectural design. In every kind of building—Industrial, Public, Commercial and Residential, INSULUX has been used successfully and economically. In homes and certain other structures, INSULUX creates a center of interest, lending a pleasing note to the whole design.

TRANSMISSION OF LIGHT

INSULUX being a hollow glass unit insures a wider range of face patterns than is possible with a single sheet of glass because of the four surfaces which may be treated. This unusual feature of INSULUX makes possible a wider variety of patterns and light transmitting values than is obtainable in single flat glass. INSULUX is available in a range of patterns, varying in their light transmitting value from 41 to 86.5 per cent.

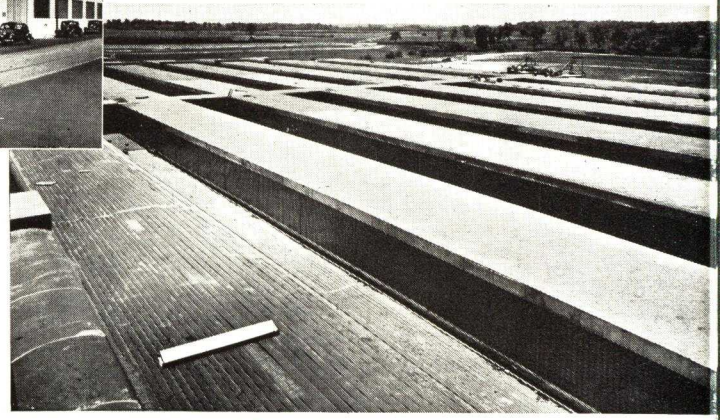


The Detroit Edison Co.
Detroit, Mich.
Designed by John Thornton

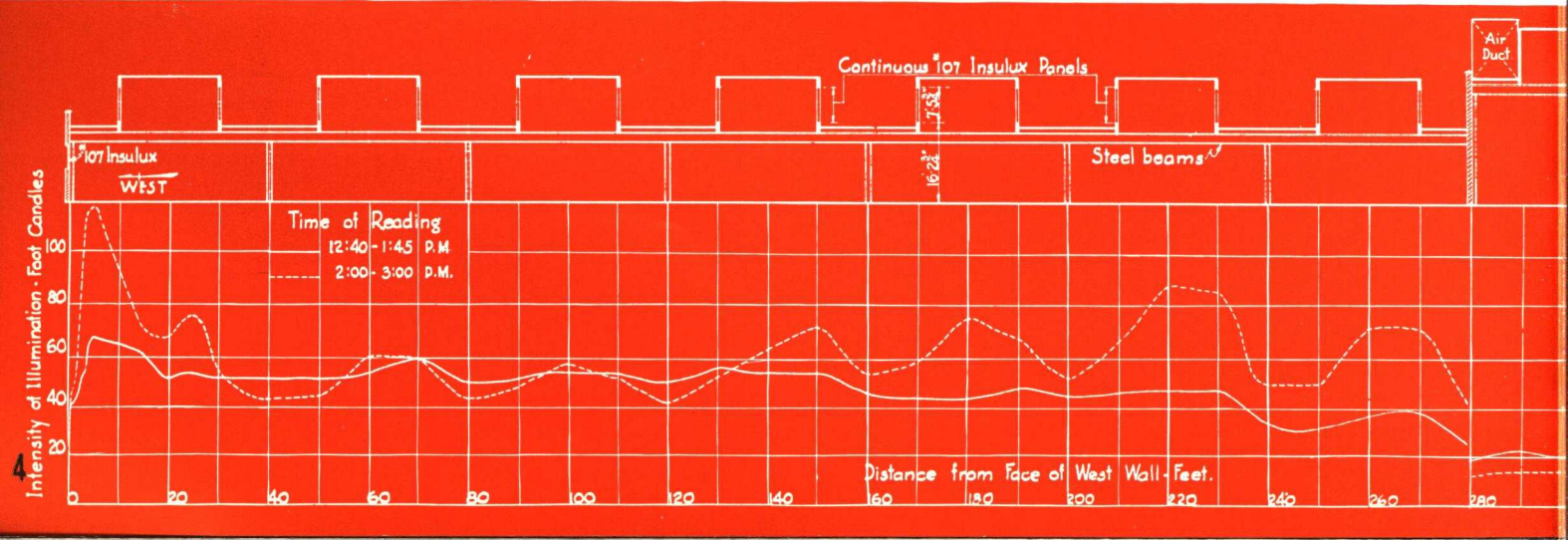
DIFFUSION AND DISTRIBUTION OF LIGHT

Face patterns of INSULUX Glass Block being formed on four surfaces have the inherent ability to properly diffuse and distribute light. Some INSULUX patterns have been designed for their decorative qualities, and others for their practical application in the transmission of light. The chart on pages 8 and 9 classifies these blocks accordingly.

A typical illustration of the light distribution which might be expected through INSULUX Glass Block is shown in the curve of light readings (at the bottom of these pages) taken at the Painesville, Ohio plant of the Industrial Rayon Corporation where INSULUX was used in the monitors.

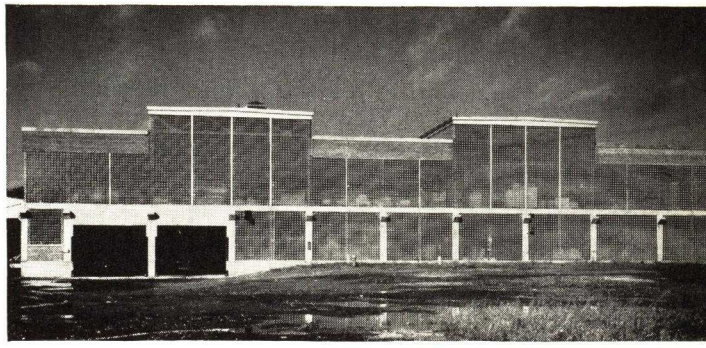


Industrial Rayon Corporation, Painesville, Ohio
Wilbur Watson & Associates, Architects & Engineers
L. J. Jordan, Chief Engineer for Industrial Rayon Corporation



THERMAL INSULATION

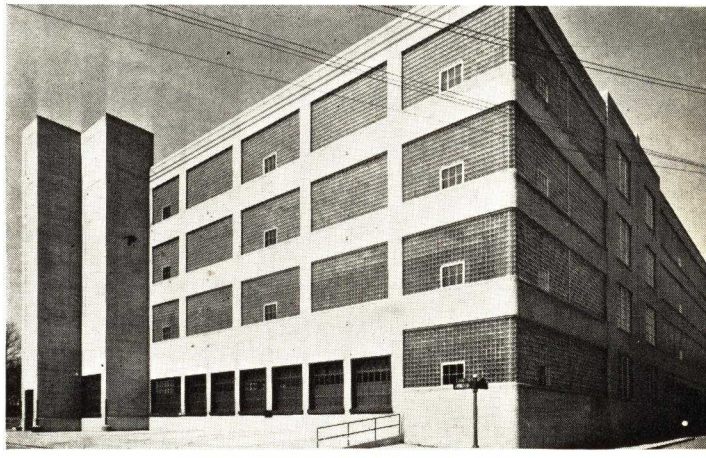
INSULUX Glass Block panels are highly resistant to heat loss by conductance. Because of this insulating value, large light transmitting areas are practical without the excessive heat loss which is experienced with sash. The low conductance of INSULUX Glass Block plus its ability to reduce solar heat transmission as compared to sash, makes it admirably adapted to use in air-conditioned buildings. It provides ample light and reduces cooling costs. (See Test Data, page 22.)



Western Printing & Lithographing Co., Poughkeepsie, N. Y.
Edwin J. Kraus, Architect

ELIMINATION OF CONDENSATION

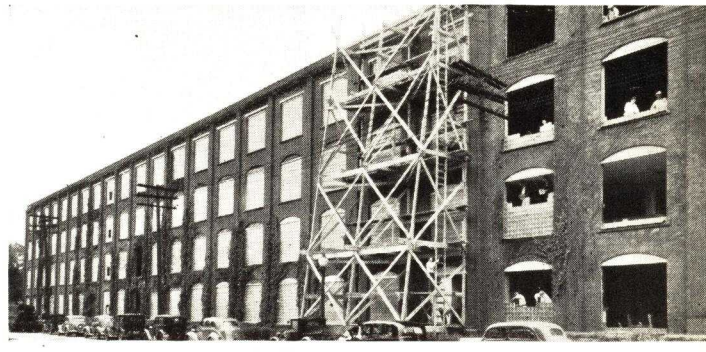
Condensation on the inside of windows during cold weather causes deterioration of sash. It is particularly prevalent in buildings where a high degree of humidity is maintained, such as dairies, food plants, textile and paper mills, tobacco factories, etc. INSULUX, because of its high insulating value, will reduce this condensation and resulting deterioration.



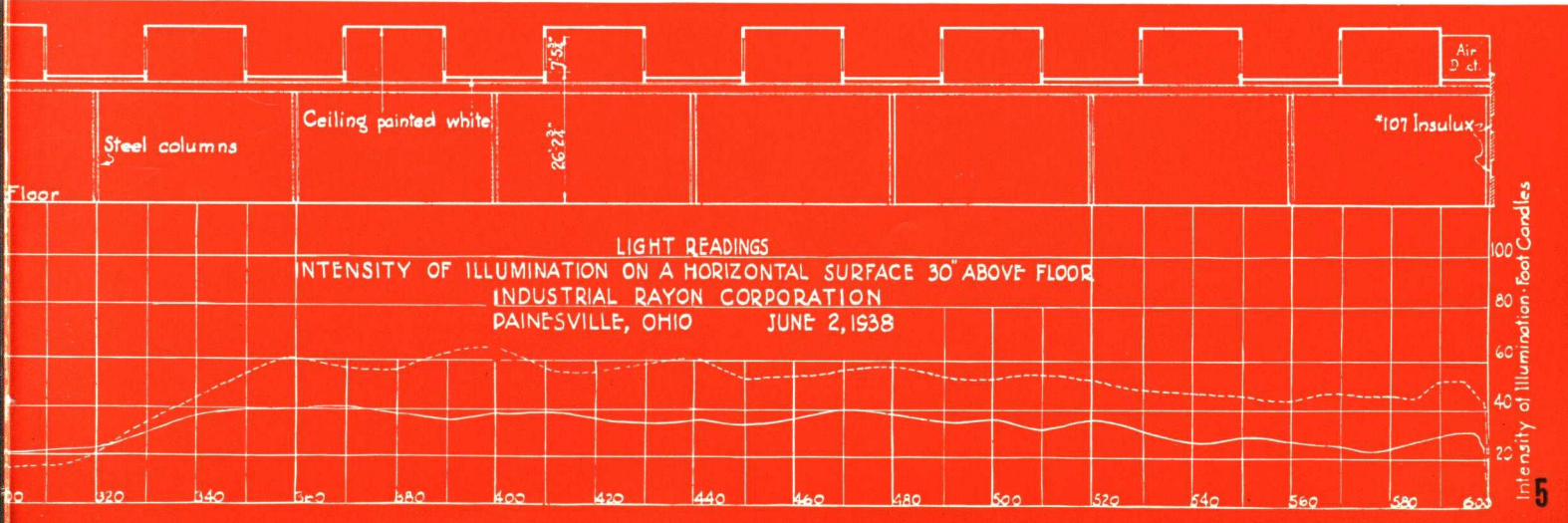
Philip Morris & Co., Ltd., Richmond, Va.
Francisco & Jacobus, Architects

REDUCTION OF SOLAR HEAT

Much of the cooling load on air-conditioning equipment is due to the transmission of solar heat through light transmitting areas which are exposed to the sun. Tests conducted at Purdue University show that INSULUX Glass Block panels materially reduce the solar heat transmission as compared to single glazed sash. This property of INSULUX Glass Block to reduce solar heat transmission, together with its low conductance and its reduction of infiltration, makes it ideal for use in air-conditioned buildings. (See Test Data, page 22.)



Carrier Corporation, Syracuse, N. Y.
Austin Company, Builders



SPECIAL FEATURES AND ADVANTAGES

Campbell Clinic, Memphis, Tenn.
Furbringer & Ehrman, Architects

West Side of 3rd Ave. between 77th and 78th—owned by the Ogden Goelet Estate, New York City
E. H. Faile, Engineer—Starrett Bros. & Eken, Contractors

REDUCTION OF AIR INFILTRATION

Air leakage through and around windows adds to the cost of heating in the winter time, increases air-conditioning costs in the summer, and, in certain industries in which high humidities are maintained, causes the formation of ice on the outside of the building in cold weather. Typical methods of installation have been developed for INSULUX Glass Block panels which, for all practical purposes, almost entirely eliminate these problems of air leakage, while aiding the maintenance of desired interior temperature and humidity.

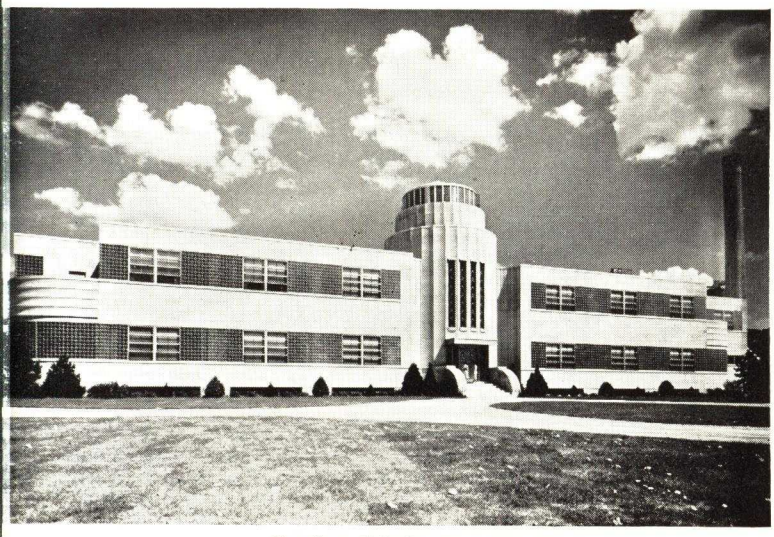
REDUCTION OF SOUND TRANSMISSION

Tests at the National Bureau of Standards show that INSULUX Glass Block panels have a sound reduction factor comparable to that of the usual partition used in fireproof structures. INSULUX can be used in light transmitting partitions without materially decreasing noise-reduction efficiency. This sound transmitting resistance makes INSULUX ideal for use in the exterior walls of buildings located near sources of noise—such as apartment buildings in New York and Chicago adjacent to elevated railways. (See Test Data, page 22.)

STRUCTURAL STRENGTH

As a result of the exclusive Owens-Illinois method of manufacture, INSULUX Glass Block has a uniform wall thickness that makes it possible to anneal the block properly, and to eliminate internal strain. This develops to the utmost the natural strength of the glass. INSULUX is not offered as a load-bearing material, yet it possesses ample compressive strength to be self-supporting within the limits prescribed by the ratio of its thickness to any practical height. (See Test Data, page 21.) Tests on individual units as well as panels of glass block have been performed at Purdue University.

Field House—Purdue University
Lafayette, Ind.
Walter Scholer, Architect



The Coca-Cola Bottling Works Company
Cincinnati, Ohio
John Henri Deekin, Architect

Roundhouse, Pennsylvania Railroad, Columbus, Ohio
Designed by Pennsylvania Railroad Staff

SANITATION AND CLEANLINESS

INSULUX Glass Block walls are easy to clean. It is the natural characteristic of glass to be non-absorbent to liquids, odors and grease. Several of the INSULUX patterns have smooth exterior faces, the designs being impressed only on the interior faces of the block. In other blocks or patterns, the faces have simple ribs running vertically on the exposed faces and horizontally on the interior faces of the block. (See pages 8 and 9). The character of these surfaces minimizes the accumulation of surface dirt and facilitates its removal. Dairies, hospitals, restaurants, packing plants and similar structures make use of this excellent feature of INSULUX in exterior walls and interior partitions.

LOW MAINTENANCE

INSULUX Glass Block walls and panels require little maintenance other than occasional cleaning. The hard, brilliant surface of the block has the natural permanence and durability of glass. Obviously, INSULUX does not require painting, either inside or out. Should a block be damaged through carelessness or accident, it may be removed easily by chipping or sawing out joints. The new block is then buttered with mortar, inserted in place and the job completed by pointing.

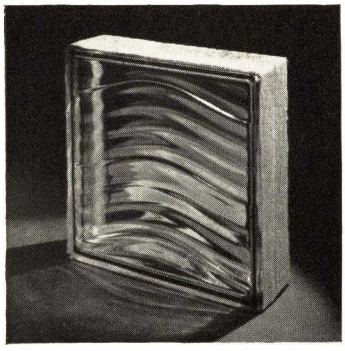
PRIVACY

In certain types of commercial and industrial buildings, and in certain installations in the home, privacy is an important consideration. INSULUX permits privacy without the darkness that is usually associated with it. In homes, it is widely used to light bathrooms, stair wells and basements where ample light with privacy is desired. INSULUX is equally effective in commercial buildings, finding widespread acceptance as the modern method of office partitioning. It is particularly adaptable to schools and hospitals where both privacy and light are essential. It also permits undesirable views to be shut out without lessening the amount of light wanted.

Apartment Building
25 East 83rd Street, New York City
Frederick L. Ackerman, Architect

DESIGNS, SIZES AND DESCRIPTION OF

SPECIAL DECORATIVE BLOCK



DESIGN No. 24

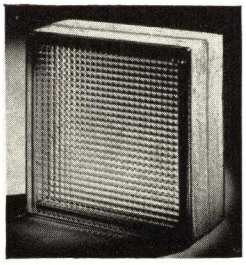
This new Insulux Block, designed by Walter Dorwin Teague, may be combined with other designs to form a variety of decorative effects. (Available only as No. 424—11¾ x 11¾ x 3⅞ inch size.) Transmits 83.5% of normal incident light.

LOW LIGHT TRANSMISSION BLOCK

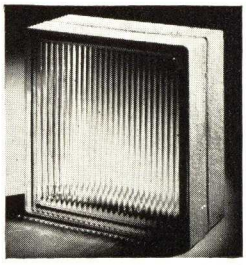
Insulux may also be had in special low light-transmitting designs, transmitting as low as 41% of normal incident light.

Designs, shapes and sizes are subject to change without notice.

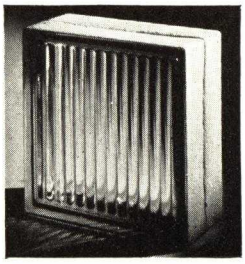
FOR LIGHT DIFFUSION AND DISTRIBUTION



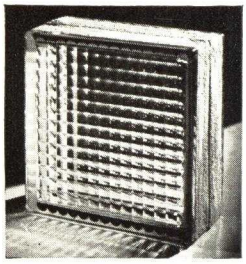
DESIGN No. 1



DESIGN No. 11



DESIGN No. 7

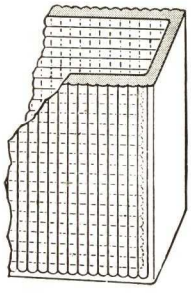


DESIGN No. 2

● These designs have found the best acceptance for use in buildings with large glass areas and where the occupancy requires well diffused and distributed light and minimum surface brightness such as in offices, classrooms, factory buildings, etc.

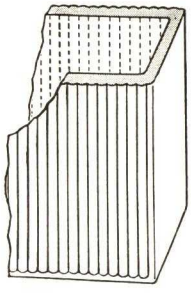
TRANSMITS 78.5% OF NORMAL INCIDENT LIGHT

Design consists of ¼-in. convex ribs carried vertically on both exterior faces and horizontally on both of the interior faces.



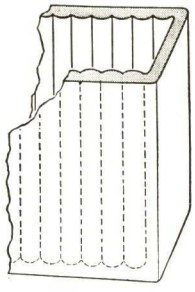
TRANSMITS 86.5% OF NORMAL INCIDENT LIGHT

Design consists of ¼-in. convex ribs carried vertically on both of the exterior faces. Both of the interior faces are smooth.



TRANSMITS 84.4% OF NORMAL INCIDENT LIGHT

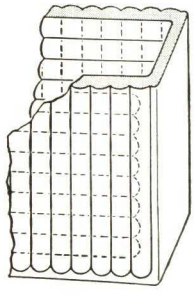
Design—½-in. (1 in. for 400 series) convex ribs carried vertically on both of the interior faces. Both of the exterior faces are smooth.



● These designs have qualities of the block sirable to obtain archite surface brightness is ob

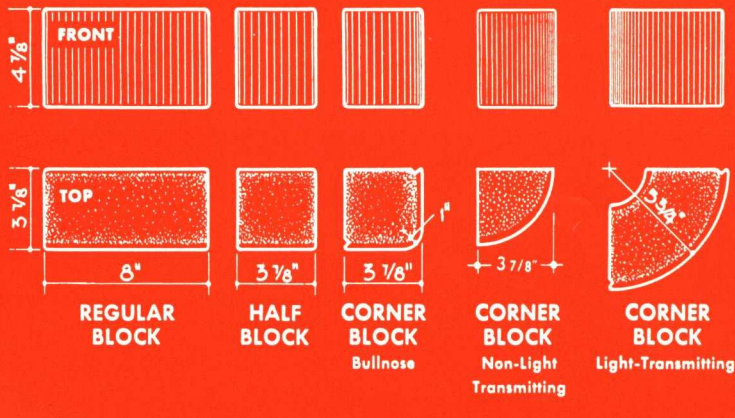
TRANSMITS 73.4% OF NORMAL INCIDENT LIGHT

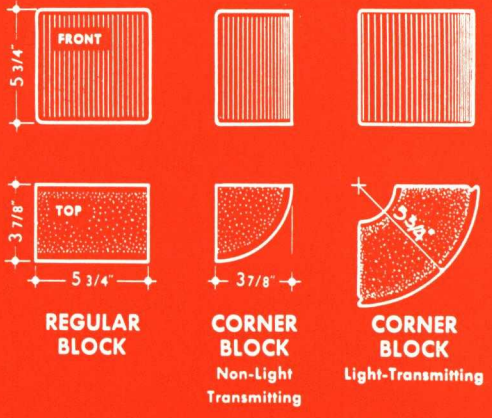
Design—½-in. (1 in. for 400 series) convex ribs carried vertically on both exterior faces and horizontally on both of the interior faces.



SERIES AND SIZE OF RECTANGULAR BLOCKS

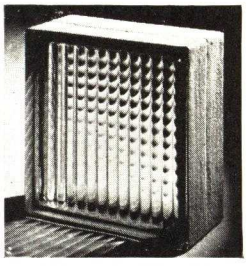
Series No.	Sizes in Inches				
100 (1)	8 x 4⅞ x 3⅞	101 (1)	111 (11)	107 (7)	102 (2)
100-H (1-H)	3⅞ x 4⅞ x 3⅞	101-H (1-H)	111-H (11-H)	107-H (7-H)	102-H (2-H)
200	5¾ x 5¾ x 3⅞	201	211	207	202
300	7¾ x 7¾ x 3⅞	301	311	307	302
400	11¾ x 11¾ x 3⅞	—	—	407	402





OWENS-ILLINOIS INSULUX GLASS BLOCK

FOR DECORATION

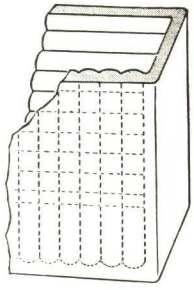


DESIGN No. 16

found the best acceptance where the decorative are paramount and where surface brightness is dectural effects. Their use in rooms of buildings where jectionable should be limited to north exposures.

TRANSMITS
84.4%
OF NORMAL
INCIDENT LIGHT

Design—½-in. (1 in. for 400 series) convex ribs carried vertically on one interior face and horizontally on the other. Exterior faces smooth.



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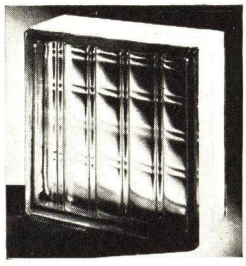
216

316

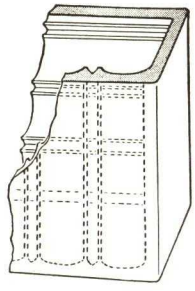
416



DESIGN No. 17

TRANSMITS
84%
OF NORMAL
INCIDENT LIGHT

Design—1½-in. (1⅝ in. for 400 series) concave ribs on both interior faces—vertical on one, horizontal on other. Both exterior faces smooth.



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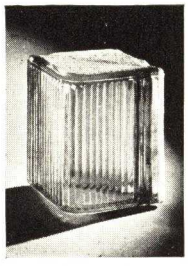
317

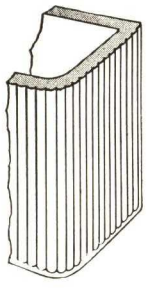
417

CORNER AND RADIAL BLOCKS



BULLNOSE

Non-light-transmitting corner block to be used with No. 100 series. Size 3⅞ x 3⅞ x 4⅞ in. Vertical exterior ribs on faces adjacent to bullnose corner, ¼-in. ribs on the "A" block and ½-in. ribs on the "B" block.



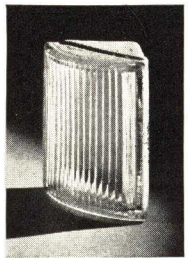
100-A—¼" Rib (1-ABN)
100-B—½" Rib (1-BBN)

—

216

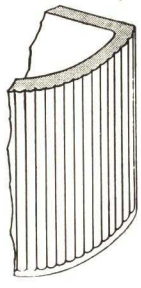
316

416



QUARTER ROUND

Non-light-transmitting corner block to be used with No. 200 and 300 series. Size for 200 series 3⅞ x 3⅞ x 5¾ in. and for 300 series 3⅞ x 3⅞ x 7¾ in. Vertical exterior ribs, ¼-in. and ½-in. on "A" and "B" blocks respectively.



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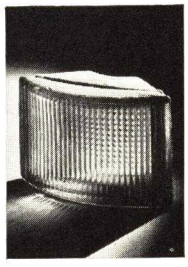
200-A—¼" Rib
200-B—½" Rib

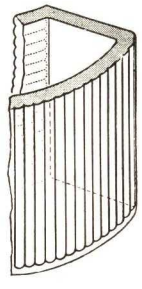
300-A—¼" Rib
300-B—½" Rib

—



LIGHT-TRANSMITTING CORNER

Block to be used with No. 100, 200 and 300 series. Height 4⅞-in. for 100 series, 5¾-in. for 200 series, 7¾-in. for 300 series. Vertical ribs on face of large radius and horizontal on face of small radius, ¼-, ½- and 1-in. ribs for "A", "B" and "C" block respectively.



100-AL—¼" Rib (1-AL)
100-BL—½" Rib (1-BL)

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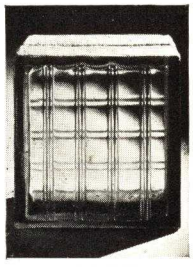
200-AL—¼" Rib
200-BL—½" Rib

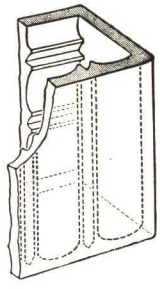
300-AL—¼" Rib
300-CL—1" Rib

402-CL—1" Rib
416-CL—1" Rib



RADIAL

Radial block can be laid to varying radii from 3 ft., 6 in. to 6 ft. through variation in mortar joint. Width of long face 7¾ in., of short face 7 in. Pattern same as No. 317 Block with inside ribs, vertical on wide face, horizontal on narrow face.



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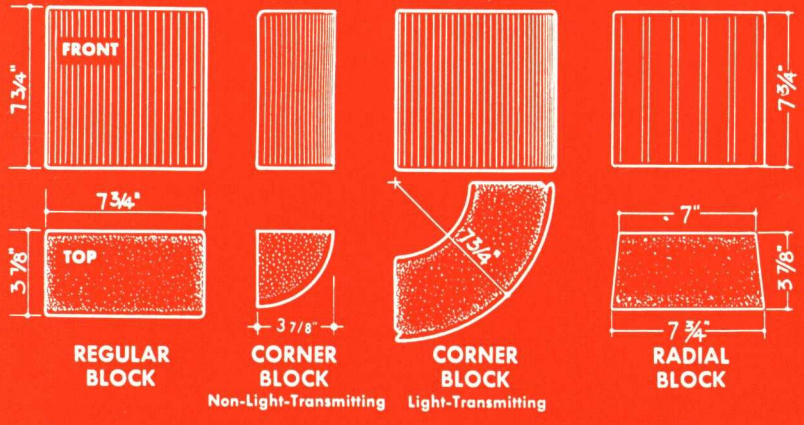
301-R
317-R (300-R)

—



REGULAR BLOCK

CORNER BLOCK
Non-Light-Transmitting

CORNER BLOCK
Light-Transmitting

RADIAL BLOCK

REGULAR BLOCK

CORNER BLOCK
Light-Transmitting

300 SERIES

400 SERIES

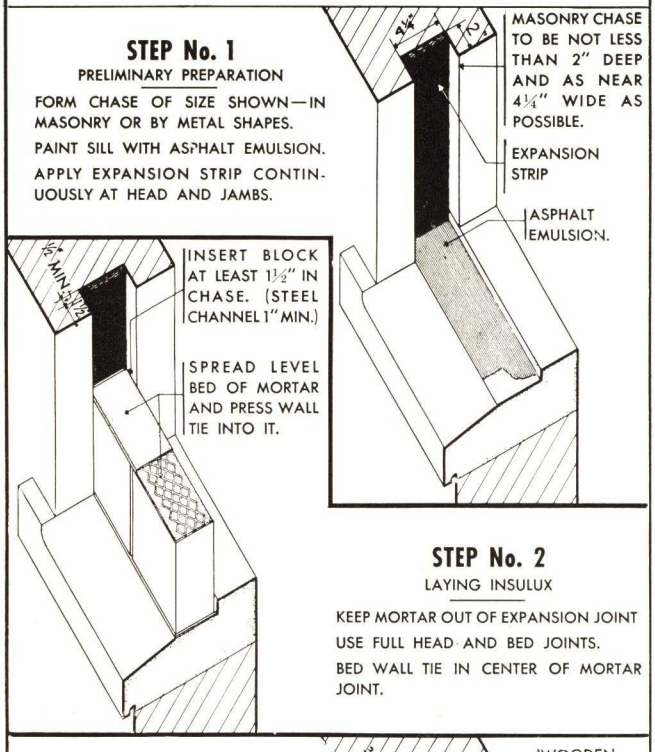
DIMENSION TABLE AND ERECTION PROCEDURE

CONSTRUCTION DETAILS

OWENS-ILLINOIS
INSULUX
GLASS BLOCK

APPROXIMATE WEIGHT PER SQ. FT. OF INSULUX, LAID UP IN PANEL: 17.5 LB.

FUNDAMENTAL PRINCIPLES FOR THE ERECTION OF TYPICAL GLASS BLOCK PANELS



STEP No. 1

PRELIMINARY PREPARATION

FORM CHASE OF SIZE SHOWN—IN MASONRY OR BY METAL SHAPES.

PAINT SILL WITH ASPHALT EMULSION.

APPLY EXPANSION STRIP CONTINUOUSLY AT HEAD AND JAMBS.

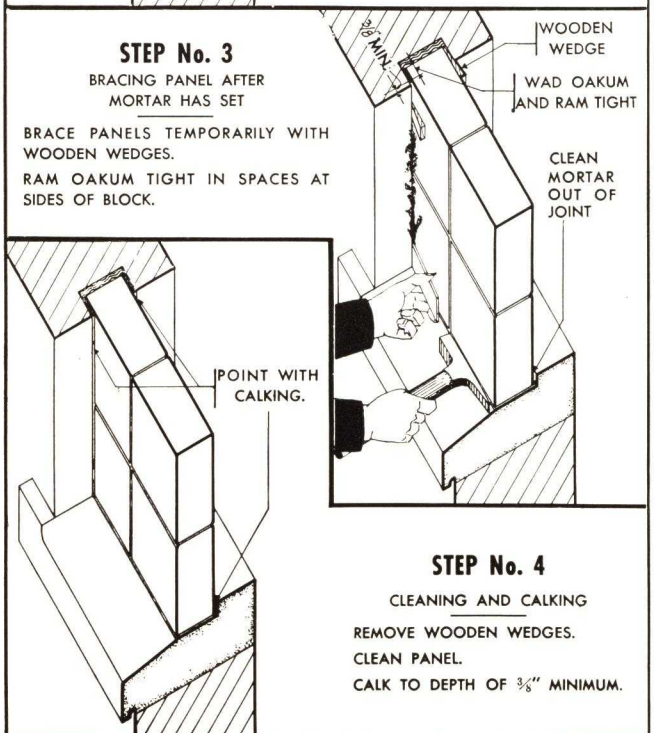
STEP No. 2

LAYING INSULUX

KEEP MORTAR OUT OF EXPANSION JOINT

USE FULL HEAD AND BED JOINTS.

BED WALL TIE IN CENTER OF MORTAR JOINT.



STEP No. 3

BRACING PANEL AFTER MORTAR HAS SET

BRACE PANELS TEMPORARILY WITH WOODEN WEDGES.

RAM OAKUM TIGHT IN SPACES AT SIDES OF BLOCK.

STEP No. 4

CLEANING AND CALKING

REMOVE WOODEN WEDGES.

CLEAN PANEL.

CALK TO DEPTH OF ⅜" MINIMUM.

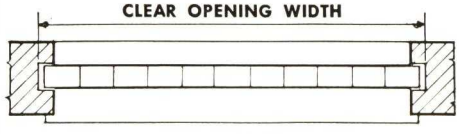
USE THIS PAGE IN CONJUNCTION WITH TYPICAL DETAILS AND SPECIFICATIONS

DIMENSION TABLE

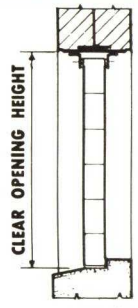
TO OBTAIN CLEAR OPENING SIZES ADD TO BLOCK TABLE DIMENSIONS:

WIDTH—AT LEAST ¾"

HEIGHT—AT LEAST ½" + MAX. LINTEL DEFLECTION



PLAN



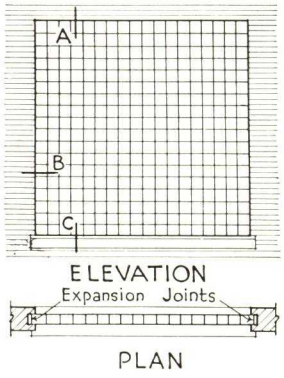
SECTION

No. of Units	4⅞" x 8"		5¾" x 5¾"	7¾" x 7¾"	11¾" x 11¾"
	Height	Width	Height or Width	Height or Width	Height or Width
	¼" joints	¼" joints	¼" joints	¼" joints	¼" joints
1	5⅛"	8¼"	6"	8"	1' - 0"
2	10¼"	1' - 4½"	1' - 0"	1' - 4"	2' - 0"
3	1' - 3⅜"	2' - 0¾"	1' - 6"	2' - 0"	3' - 0"
4	1' - 8½"	2' - 9"	2' - 0"	2' - 8"	4' - 0"
5	2' - 1⅝"	3' - 5¼"	2' - 6"	3' - 4"	5' - 0"
6	2' - 6¾"	4' - 1½"	3' - 0"	4' - 0"	6' - 0"
7	2' - 11⅞"	4' - 9¾"	3' - 6"	4' - 8"	7' - 0"
8	3' - 5"	5' - 6"	4' - 0"	5' - 4"	8' - 0"
9	3' - 10⅛"	6' - 2¼"	4' - 6"	6' - 0"	9' - 0"
10	4' - 3¼"	6' - 10½"	5' - 0"	6' - 8"	10' - 0"
11	4' - 8⅜"	7' - 6¾"	5' - 6"	7' - 4"	11' - 0"
12	5' - 1½"	8' - 3"	6' - 0"	8' - 0"	12' - 0"
13	5' - 6⅝"	8' - 11¼"	6' - 6"	8' - 8"	13' - 0"
14	5' - 11¾"	9' - 7½"	7' - 0"	9' - 4"	14' - 0"
15	6' - 4⅞"	10' - 3¾"	7' - 6"	10' - 0"	15' - 0"
16	6' - 10"	11' - 0"	8' - 0"	10' - 8"	16' - 0"
17	7' - 3⅛"	11' - 8¼"	8' - 6"	11' - 4"	17' - 0"
18	7' - 8¼"	12' - 4½"	9' - 0"	12' - 0"	18' - 0"
19	8' - 1⅜"	13' - 0¾"	9' - 6"	12' - 8"	19' - 0"
20	8' - 6½"	13' - 9"	10' - 0"	13' - 4"	20' - 0"
21	8' - 11⅝"	14' - 5¼"	10' - 6"	14' - 0"	21' - 0"
22	9' - 4¾"	15' - 1½"	11' - 0"	14' - 8"	22' - 0"
23	9' - 9⅞"	15' - 9¾"	11' - 6"	15' - 4"	23' - 0"
24	10' - 3"	16' - 6"	12' - 0"	16' - 0"	24' - 0"
25	10' - 8⅛"	17' - 2¼"	12' - 6"	16' - 8"	25' - 0"
26	11' - 1¼"	17' - 10½"	13' - 0"	17' - 4"	26' - 0"
27	11' - 6⅜"	18' - 6¾"	13' - 6"	18' - 0"	27' - 0"
28	11' - 11½"	19' - 3"	14' - 0"	18' - 8"	28' - 0"
29	12' - 4⅝"	19' - 11¼"	14' - 6"	19' - 4"	29' - 0"
30	12' - 9¾"	20' - 7½"	15' - 0"	20' - 0"	30' - 0"
31	13' - 2⅞"	21' - 3¾"	15' - 6"	20' - 8"	31' - 0"
32	13' - 8"	22' - 0"	16' - 0"	21' - 4"	32' - 0"
33	14' - 1⅛"	22' - 8¼"	16' - 6"	22' - 0"	33' - 0"
34	14' - 6¼"	23' - 4½"	17' - 0"	22' - 8"	34' - 0"

OWENS-ILLINOIS
INSULUX GLASS BLOCK

CONSTRUCTION DETAILS

PANELS IN 12" MASONRY WALLS



PANELS IN 12" MASONRY WALLS

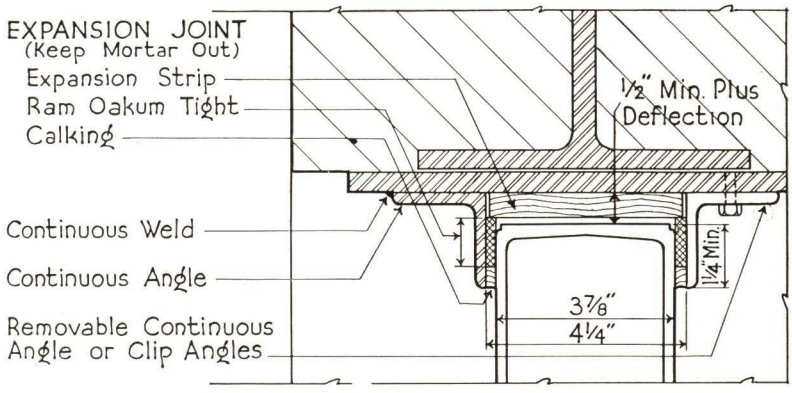
HEAD—Form "Expansion Joint" as shown on Detail A. **Keep expansion joints clear of all obstructions such as rivet or bolt heads, clip angles and mortar.**

JAMB— It is important to maintain the width and depth of "chases" as shown on Detail B. Irregularities of workmanship and material used in forming a masonry chase may be corrected where necessary by parging one or both sides of the chase. This permits the proper wedging action of the rammed oakum to support the panel against wind pressure.

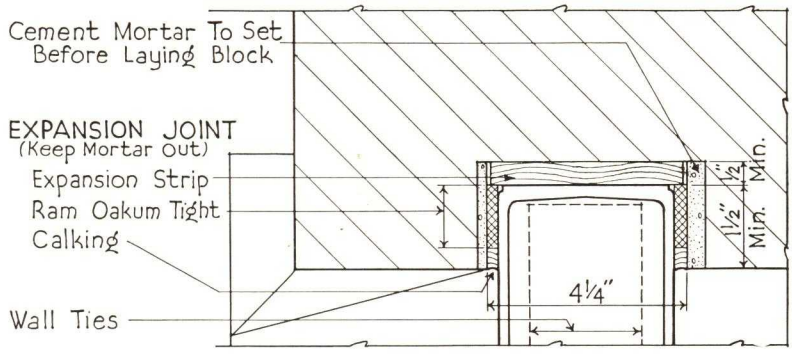
MORTAR JOINTS—All mortar joints are to be evenly and completely filled with mortar. Horizontal mortar joints are to be reinforced at intervals with continuous wall ties. See specifications.

SILL—Apply heavy brush coat of asphalt emulsion to sills. Allow emulsion to dry before laying first mortar bed.

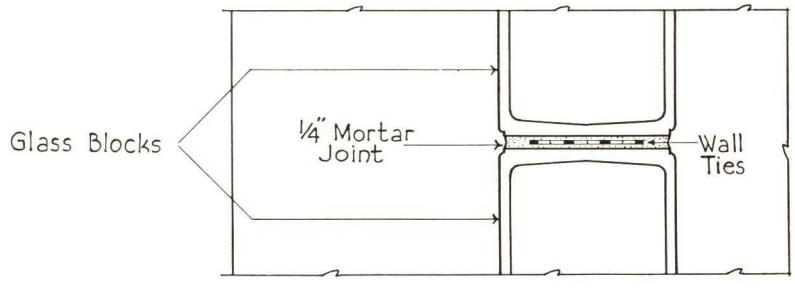
IMPORTANT... For panels larger than 144 sq. ft. in area or more than 20 lineal feet in any direction, see reinforcing details on pages 13 and 14.



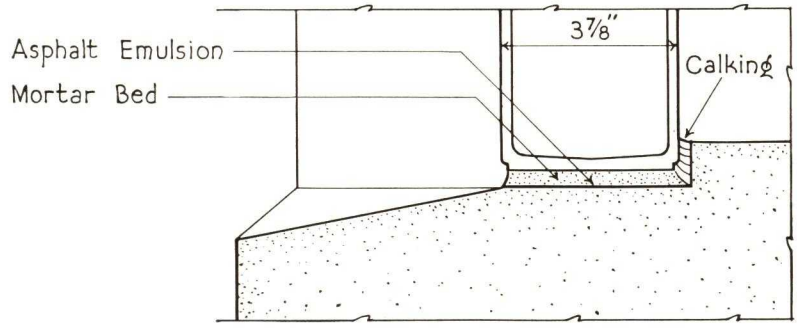
HEAD DETAIL "A"



JAMB DETAIL "B"



MORTAR JOINT DETAIL



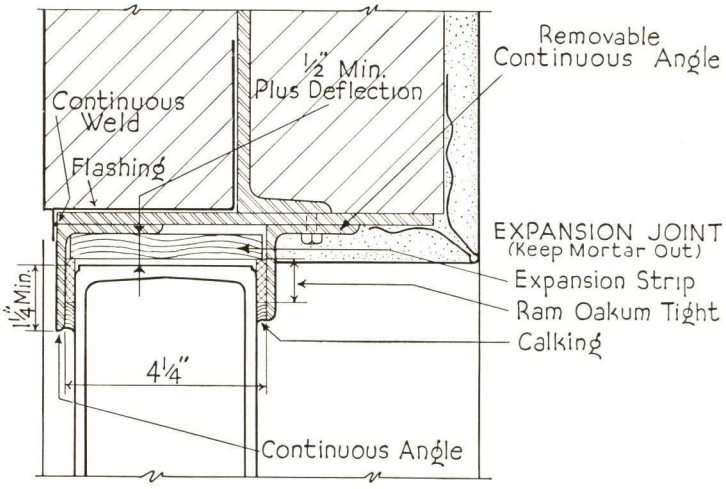
SILL DETAIL "C"

Scale 3" = 1'-0"

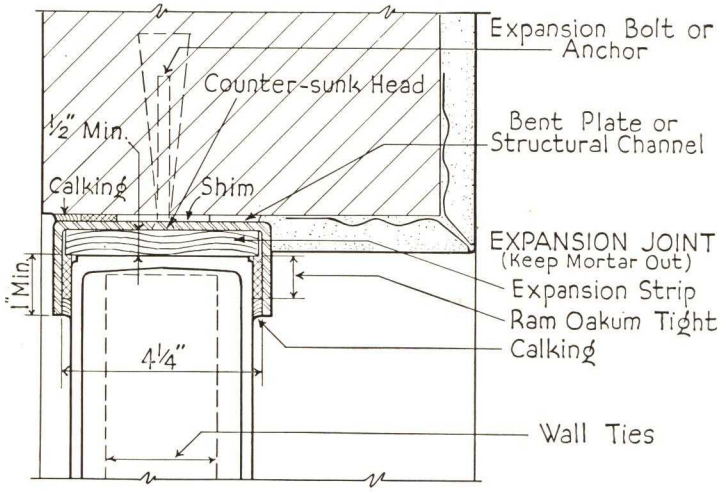
PANELS IN METAL FRAMES OR 8" MASONRY WALLS

CONSTRUCTION DETAILS

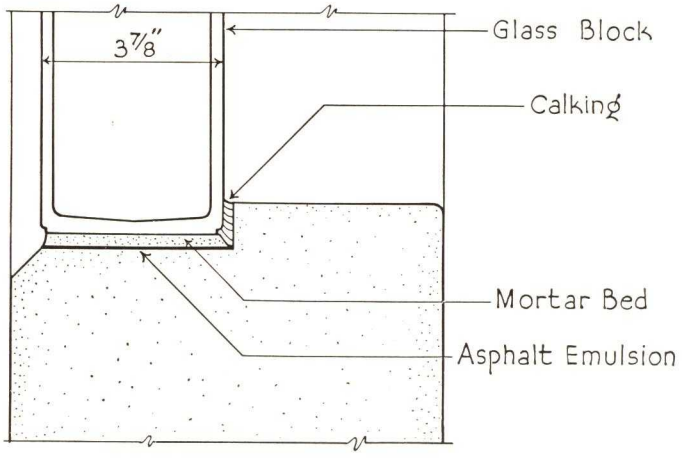
OWENS-ILLINOIS INSULUX GLASS BLOCK



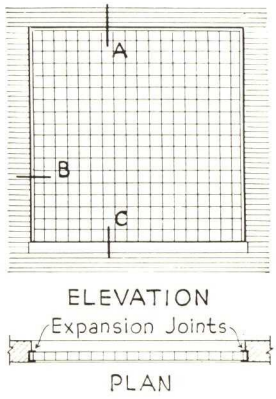
HEAD DETAIL "A"



JAMB DETAIL "B"



SILL DETAIL "C"
Scale 3" = 1'-0"

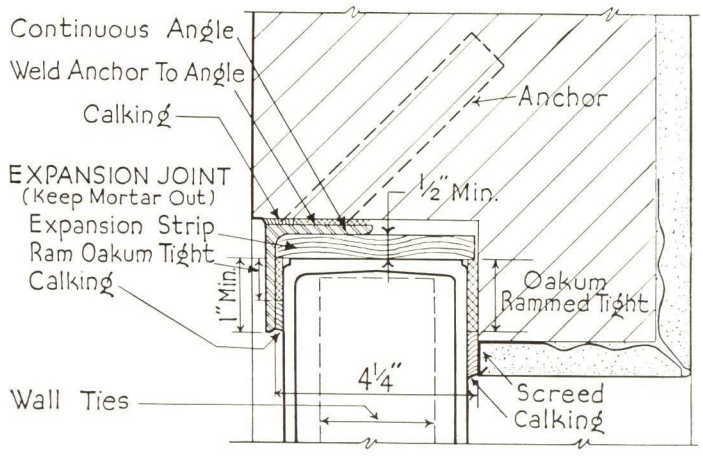


PANELS IN METAL FRAMES OR 8" MASONRY WALLS

These details are typical for Insulux panels when it is not practical to set them in a masonry chase at the jambs (as shown on page 11) or when installing them in an 8" masonry wall. This construction will also permit a variation in the depth of the opening reveal.

Due to the regularity of the "chase" or recess formed by metal shapes, the block may be set into these frames a minimum of 1" at the jambs (as compared to a minimum of 1½" in masonry). This will permit the proper wedging action of rammed oakum to support the panel against wind pressure. **Metal frames are to be designed so that no bolt or rivet heads, clip angles or other obstructions project into the expansion joints.**

IMPORTANT... For panels larger than 144 sq. ft. in area or more than 20'-0" in any direction, see reinforcing details pages 13 and 14.



ALTERNATE JAMB "B"
Scale 3" = 1'-0"

OWENS-ILLINOIS
INSULUX
GLASS BLOCK

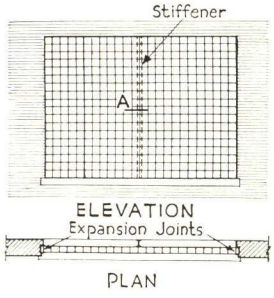
CONSTRUCTION DETAILS

LONG PANELS

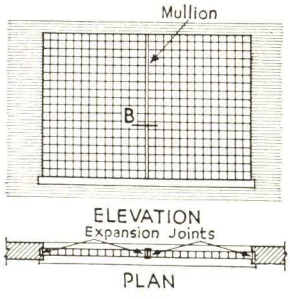
INTERMEDIATE REINFORCING FOR LONG PANELS

Long Insulux panels are either to be braced by intermediate structural stiffeners and/or are to be sub-divided by mullions, according to the limitations noted below.

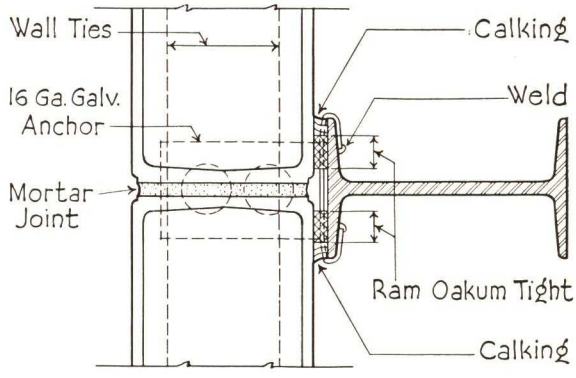
Design members for proper stiffness. **Connections (clip angles, bolts or rivets) are not to project into expansion joints.**



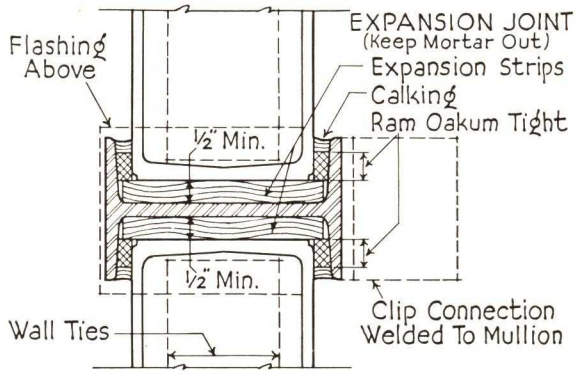
STIFFENERS—Panels more than 144 sq. ft. but less than 200 sq. ft. in area and not more than 20'-0" in length are to be braced by and anchored to structural stiffeners. (See Detail A)



MULLIONS—Panels more than 20'-0" in length or more than 200 sq. ft. in area are to be sub-divided by mullions instead of stiffeners. H type mullion sections (See Details) furnish "chase" design into which the panel edges are set and permit expansion and support against wind pressure. If areas between mullions exceed 144 sq. ft., these areas are to be further braced by vertical stiffeners.

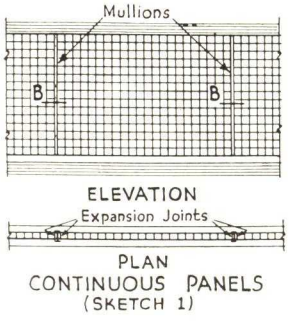


STIFFENER DETAIL "A"

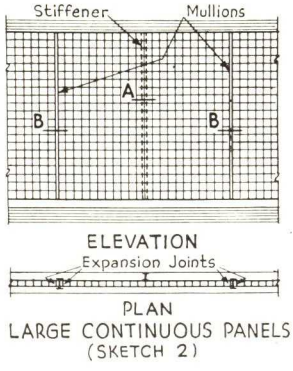


MULLION DETAIL "B"

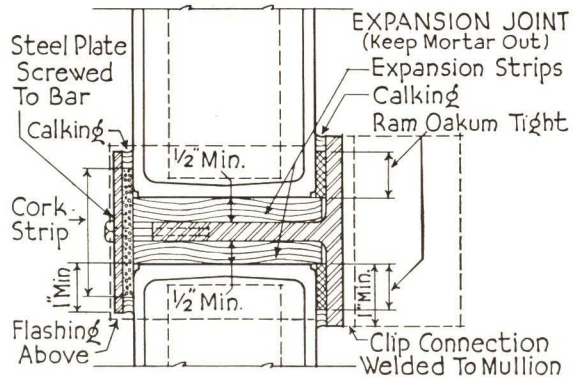
CONTINUOUS PANELS—Continuous panels (Sketch 1) are to be sub-divided into areas not greater than 200 sq. ft. by mullions (Detail B) spaced not more than 20'-0" apart. When these divisions (see Sketch 2) exceed 144 sq. ft. in area they are to be further braced by structural stiffeners (Detail A) at intermediate points.



CONTINUOUS PANELS
(SKETCH 1)



LARGE CONTINUOUS PANELS
(SKETCH 2)



ALTERNATE MULLION "B"

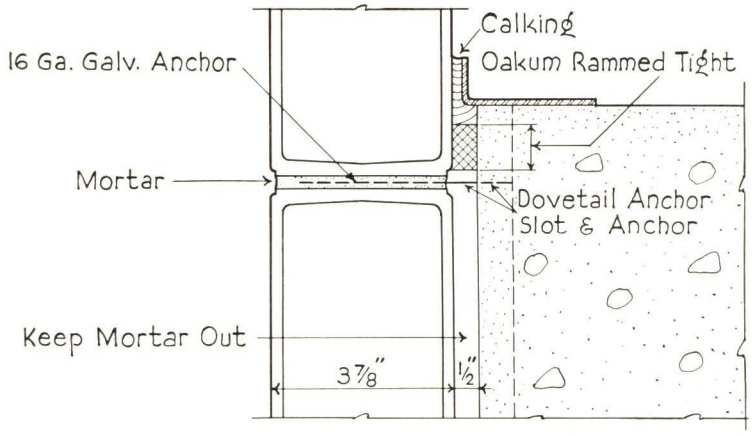
Scale 3"=1'-0"

TALL PANELS CONSTRUCTION DETAILS

OWENS-ILLINOIS INSULUX GLASS BLOCK

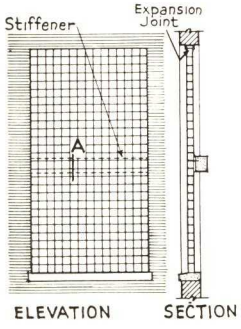
INTERMEDIATE REINFORCING FOR TALL PANELS

High panels are either to be braced by intermediate stiffeners (or spandrels) or are to be subdivided by shelf angles according to the limitations noted below.

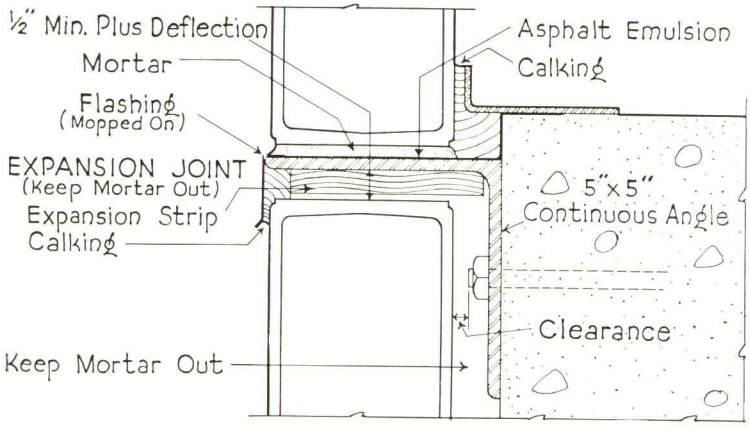


STIFFENER DETAIL "A"

PANELS LESS THAN 20'-0" IN HEIGHT

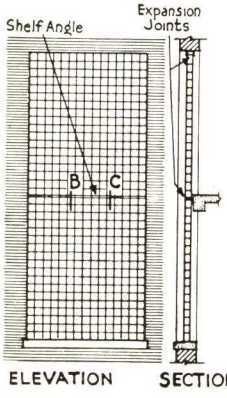


Panels more than 144 sq. ft. but less than 200 sq. ft. in area are to be braced by and anchored to stiffeners by 16 ga. gal. perforated anchors fastened to stiffeners and embedded in glass block mortar joints (Detail A).

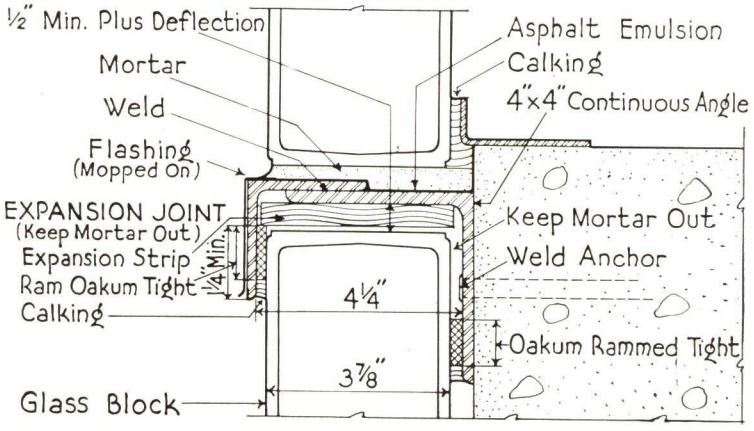


SHELF ANGLE DETAIL "B"

PANELS MORE THAN 20'-0" IN HEIGHT



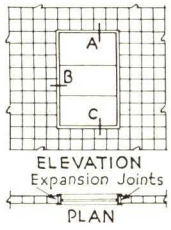
Panels more than 20'-0" in height or more than 200 sq. ft. in area are to be subdivided by shelf angles. (See Detail B.) If areas between shelf angles exceed 144 sq. ft., these areas are to be further braced by vertical or horizontal stiffeners. (See Detail A). If panels are wider than 10'-0", use (Detail C).



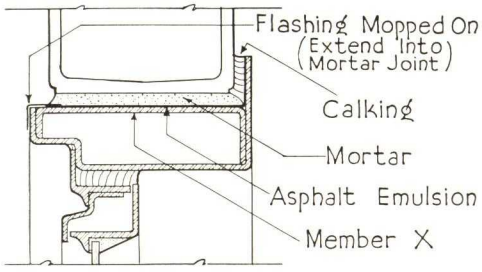
SHELF ANGLE DETAIL "C"

Scale 3"=1'-0"

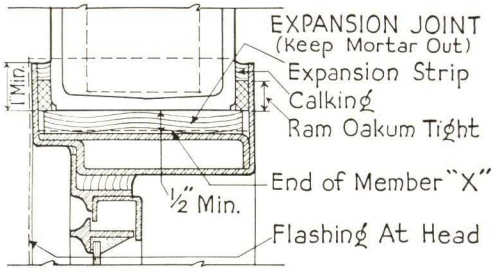
OWENS-ILLINOIS
INSULUX GLASS BLOCK CONSTRUCTION DETAILS
METAL WINDOW FRAMES



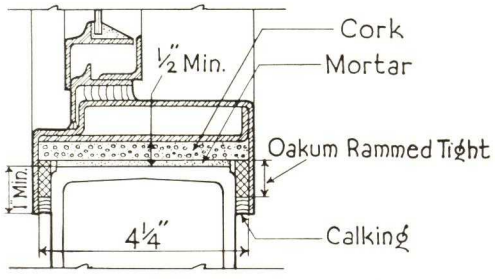
METHOD 1—This method provides a means of installing one or more isolated sash (not connected to building structure) in panels not exceeding 144 sq. ft. in area. Each sash should not exceed 15 sq. ft. nor their total area exceed 20% of the panel area. (See Details A, B, C.)



HEAD DETAIL "A"



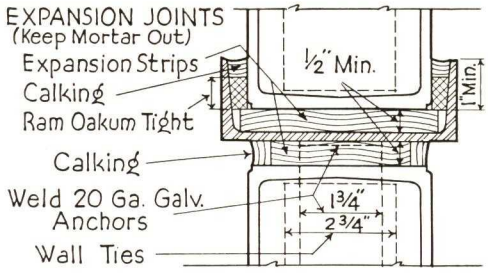
JAMB DETAIL "B"



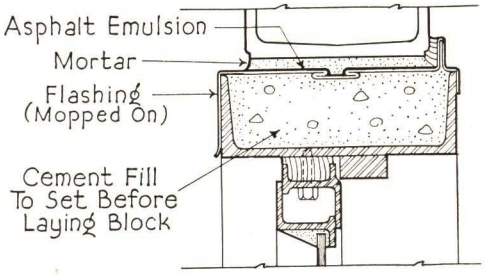
SILL DETAIL "C"
PRESSED METAL WINDOW FRAMES
Scale 3"=1'-0"

METAL WINDOW FRAMES IN INSULUX PANELS

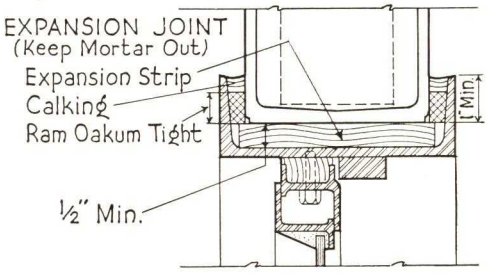
When ventilation or vision is required in outside walls, sash may be installed in Insulux panels. Two typical methods for designing this combination of sash and block are detailed below. **The required sub-frames for steel sash are to be designed so that no bolts, rivets or clip angles occur in expansion joints.** Where fire department means of access is required by the Building Codes, any form of window (min. size 32" wide and 48" high) manually operated or fixed may be used.



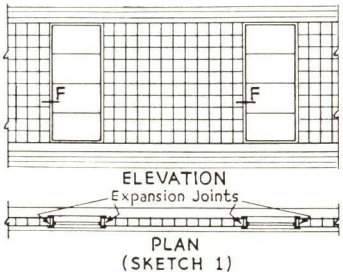
SECTION "D"



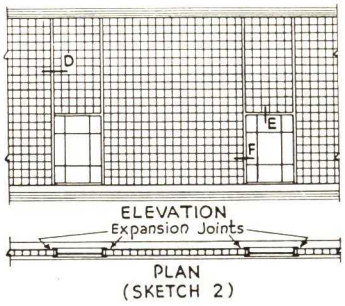
HEAD DETAIL "E"



JAMB DETAIL "F"
STRUCTURAL CHANNEL WINDOW FRAMES
Scale 3"=1'-0"



(SKETCH 1)



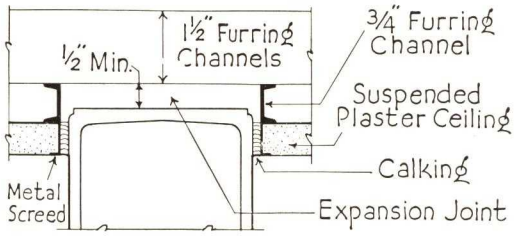
(SKETCH 2)

METHOD 2—When window areas exceed the sizes shown in Method 1, window subframes are to be anchored directly to the building structure. Sketch 1 and Sketch 2 show two methods for this type of construction. The structural shapes shown in details D, E, and F act not only as subframes for the sash but furnish intermediate reinforcing and expansion joints for large or continuous panels.

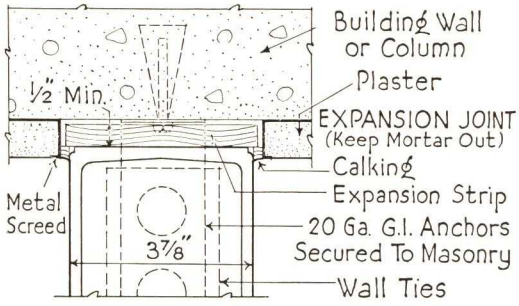
METAL DOOR FRAMES
WOOD CONSTRUCTION
INTERIOR PARTITIONS

CONSTRUCTION DETAILS

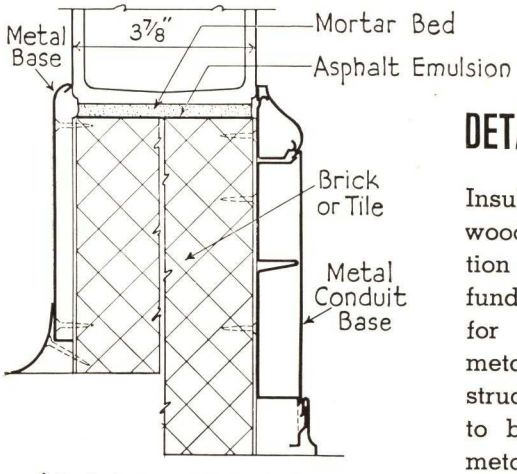
OWENS-ILLINOIS
INSULUX
GLASS BLOCK



HEAD DETAIL



JAMB DETAIL



*BASE DETAIL
Scale 3"=1'-0"

INTERIOR PARTITIONS

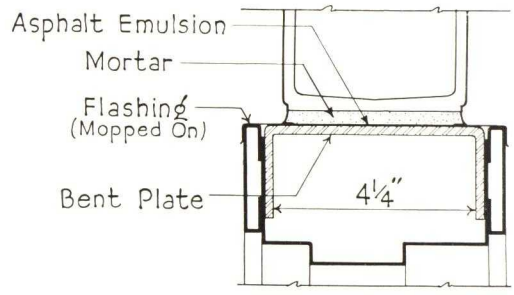
The installation of Insulux glass block in partitions conforms to the fundamentals shown for exterior construction — providing expansion joints at both jambs and head, adequate anchorage and using wall ties as called for in specifications.

Limiting sizes of panels may be increased to 200 sq. ft. in area without intermediate bracing, providing adequate anchorage for the panel is obtained at jambs and head by a chase or channel frame.

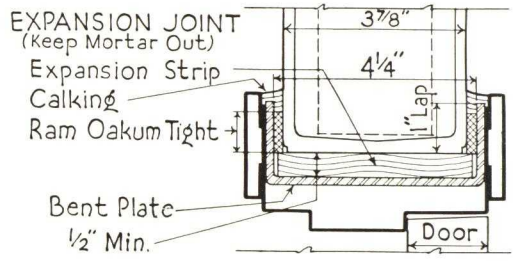
***Base details show two alternate methods.**

DETAILS OF EXTERIOR METAL DOOR FRAMES

All door frames are to be securely anchored to the building structure at the sills. For large doors or doors subjected to rough usage, extend channel frames and anchor them to the building structure.



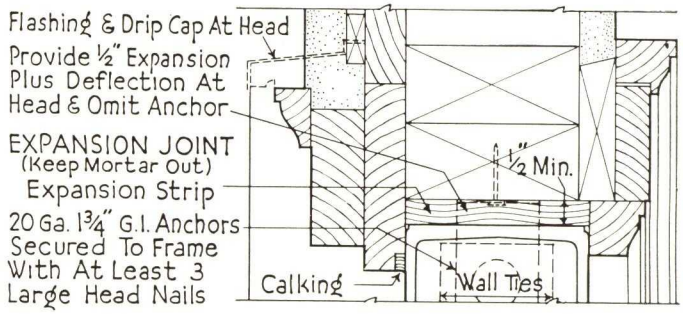
DOOR HEAD



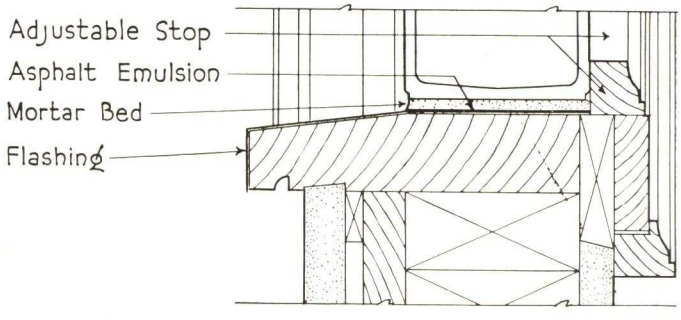
DOOR JAMB

DETAILS OF PANELS IN WOOD FRAME CONSTRUCTION

Insulux panels in wood frame construction conform to the fundamentals shown for masonry and metal frame construction. Wood sills to be covered with metal flashing and painted with asphalt emulsion before laying block. See Sill Detail.



JAMB DETAIL
HEAD SIMILAR AS NOTED



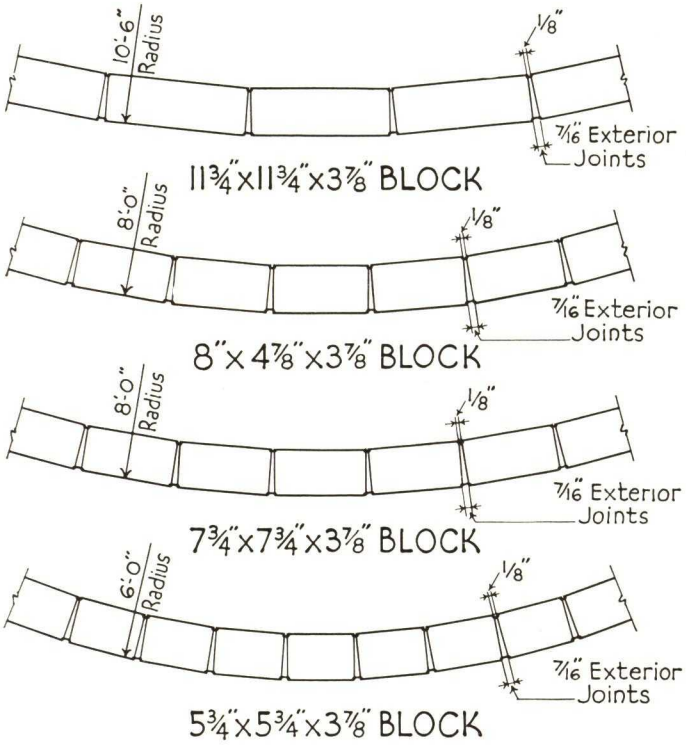
SILL DETAIL
Scale 3"=1'-0"

OWENS-ILLINOIS
INSULUX GLASS BLOCK CONSTRUCTION DETAILS

MIN. LAYING RADII
ALTERNATE DETAILS
FOR SMALL PANELS

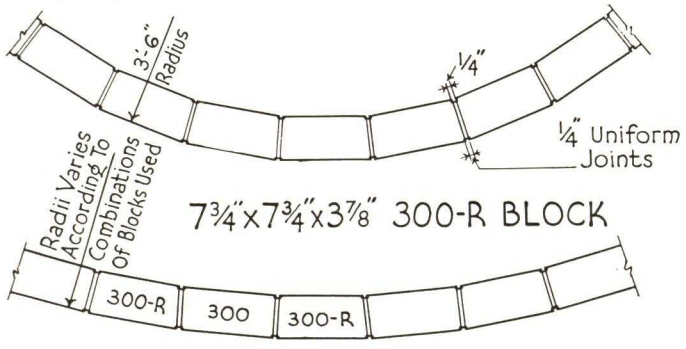
MINIMUM LAYING RADII FOR STANDARD BLOCK

Standard Insulux block can be laid on a variety of radii by varying the mortar joint thicknesses. Special radial block are for small radii and are available only in 317-R and 301-R.



LAYING RADII FOR RADIAL BLOCK

Special radial block are available in the 300 Series (outside face size 7¾ x 7¾ inches) in two designs—317-R and 301-R. These block will permit the laying of smaller radii than standard block. The minimum laying radius for this block (maintaining 7/16 inch outside joint) is 2'6". By combining radial block and standard block in various combinations, great flexibility is possible.



300 & 300-R BLOCKS

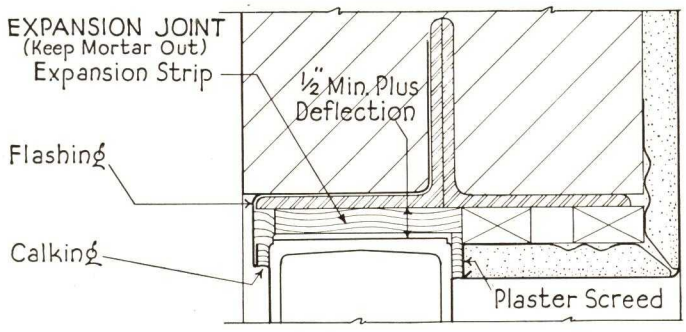
ALTERNATE DETAILS FOR SMALL PANELS

These details are only to be used when it is impractical to use "chase" construction. They should never be used for panels larger than *80 sq. ft. in area or more than 8'0" in height* or for any panels having severe exposures such as in tall buildings.

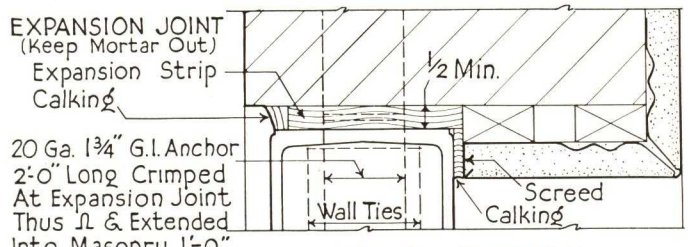
HEAD—Form expansion joints as shown keeping them clear of mortar and other obstructions. The heads of all panels should be flashed and when panels exceed 6'0" in length use interior and exterior stop angles. (See Detail A, page 12).

JAMB—Anchor panels as shown and as specified. Anchors are to be crimped to provide for expansion and contraction of panels. **It is extremely important that mortar does not lodge in expansion joints by building up around anchors.**

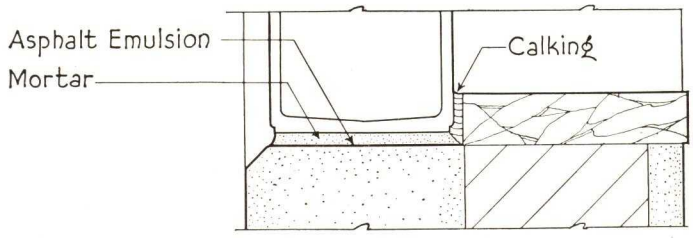
Note: Expanded metal wall ties are not to be used as anchors. See specifications.



HEAD DETAIL



JAMB DETAIL



SILL DETAIL

Scale 3"= 1'-0"

SPECIFICATIONS PAGE 1

BASIC SPECIFICATIONS

OWENS-ILLINOIS INSULUX GLASS BLOCK

GLASS BLOCK—Glass Block shown on the drawings, or called for in these specifications shall be hollow, partially evacuated, water-clear units of pressed glass as manufactured by Owens-Illinois Glass Company. All shell walls of the block shall be not less than 3/16 of an inch thick. All mortar-bearing surfaces of the block shall be true and straight with a tolerance of 1/16 of an inch, plus or minus, and shall be precoated with an alkali and moisture-resistant, grit-bearing material. The face dimensions of the glass block shall be as shown on the drawings. All blocks shall be 3⅞ inches thick with a tolerance of 1/16 inch. The face design of the block shall be as designated, by number, on the drawings.

(Indented type matter is explanatory and need not be included in specifications if covered in drawings.)

Insulux Glass Block are light-transmitting building units designed to be laid up in mortar by bricklayers and have flat mortar-bearing surfaces as is common practice in other units with which the bricklayer already is familiar. The grit-bearing bond material that is baked on at the factory insures adhesive and shear values at the mortar joint where needed. Face designs, obtained by ribs and other configurations on the interior and/or exterior surfaces of the block shells, control the transmission and diffusion of light and are designated by number as illustrated on Pages 8 and 9. Face Dimensions of standard block are: (4⅞" x 8") (5¾" x 5¾") (7¾" x 7¾") (11¾" x 11¾").

MORTAR—The materials used in the mortar shall be measured by volume. The mortar shall be composed of one part waterproof Portland cement, one part lime, and four parts of well-graded sand, shall be mixed in a watertight box and hoed from end to end until thoroughly incorporated. Prepared masonry mortars of high strength and low volume change, mixed according to the manufacturer's directions, may be substituted if desired. Consistency shall be such that the hoe is clean when withdrawn from the mortar, the resulting mixture being drier than that used for ordinary brick work.

CEMENT—All cement used in the mortar shall be waterproof Portland cement, complying with the specifications of the American Society for Testing Materials.

LIME—Lime shall be either hydrated lime or a high calcium, well slaked, quick lime. Quick lime shall be slaked in a watertight box, using sufficient water to prevent burning. During the slaking it shall be hoed thoroughly. All slaked lime shall be aged for at least seven days before using. All hydrated lime shall meet the standard specification of the American Society for Testing Materials.

SAND—All sand used for mortar shall be clean, free from vegetable matter, loam, clay and other foreign matter. It shall be of the following sieve analysis:

100%	to pass No. 10 sieve
80% – 100%	to pass No. 16 sieve
40% – 85%	to pass No. 30 sieve
10% – 30%	to pass No. 50 sieve
0% – 5%	to pass No. 100 sieve

WALL TIES—Horizontal mortar joints shall be reinforced with flat rolled ¾" mesh 20-gauge expanded metal wall ties, 2¾ inches wide by eight feet long, galvanized after forming. Ties shall run continuously by lapping ends six inches and shall be located in certain horizontal mortar joints as follows:

No. 100 Series Block, every fourth course
No. 200 Series Block, every fourth course
No. 300 Series Block, every third course
No. 400 Series Block, every course

Upon approval of the architect, alternate wall ties of 20-gauge galvanized steel strips, 1¾ inches wide by six feet long, perforated with rectangular holes, 1⅝ inches on centers, may be substituted for the expanded metal wall ties.

Ties shall not be laid directly on the block, but shall be completely embedded in the center of the mortar joint.

Wall ties serve a dual purpose. They reinforce the horizontal mortar joints against wind pressure and materially reduce the possibility of cracks. They are laid in the horizontal joints, rather than in the vertical joints, because the bricklayer can bed them properly, thereby attaining their maximum efficiency. Attempts to place light reinforcement in vertical joints have been proved to destroy the effective results of a "shoved" joint.

LAYING OF GLASS BLOCK—In laying glass block, all mortar joints shall be filled completely with mortar. The joints shall be not less than ¼ inch thick or not more than ⅜ inch thick. Block shall not be hit with a metal tool, but laid by the method known as "shoving", (working into place with the hands) thereby compressing the vertical joints. After the mortar has passed its initial set, the exposed edges of the joints shall be tooled and thoroughly compressed with a round jointer. The finished surface of the joint shall be slightly concave, smooth and nonporous. The final cleaning shall not be done until after the mortar has reached its final set.

If blocks are in any way disturbed after laying, during

OWENS-ILLINOIS
INSULUX
GLASS BLOCK

BASIC SPECIFICATIONS

SPECIFICATIONS
PAGE 2

the plumbing, tooling, or cleaning process, such blocks shall be removed and relaid.

A ¼ inch minimum joint thickness is required because a certain percentage of the horizontal joints contain continuous steel wall ties and/or wall anchors which would come into direct contact with the glass in a thinner joint: this joint thickness enables the bricklayer to lay the block with ease. A maximum thickness of ⅜" is called for because: thicker joints cause undue shrinkage, which is particularly objectionable in 4" walls: thick joints are also too rigid and inflexible to accommodate sudden thermal change. It has been found that if the bricklayers' trowel handles are capped with a common type of rubber ferule used on crutches, tapping of the blocks can be resorted to, to supplant "shoving."

SILLS — Apply heavy brush coat of asphalt emulsion to sills before the first mortar joint is laid. Allow emulsion to dry before spreading mortar.

EXPANSION JOINTS, ANCHORAGE, AND PANEL SIZES — Expansion joints shall be provided at the junction of glass block and all other materials (heads, jambs, shelf angles, window and door frames) except at the sill. They are to be formed by setting the edges of the panel into a "chase" or recess at heads and jambs, constructed as shown on the drawings. Large panels shall have intermediate expansion joints and shall be reinforced as shown on the drawings.

Insulux Glass Block is not a load-bearing material and lintels are required above all panels. Expansion joints at heads and jambs are to be designed to support the panel against wind pressure (inward and outward) and yet cushion the edges of the panel from direct contact with the building structure. (See details, page 11.) Large panels (more than 144 sq. ft., but less than 200 sq. ft. in area, and not more than 20 ft. in either direction) are to be braced by structural stiffening members. (See details, page 13.) Panels more than 20 ft. in either direction or more than 200 sq. ft. in area are to be subdivided by mullions or shelf angles designed to allow for intermediate expansion and to resist wind pressure. (See details, page 13.) If areas between mullions or shelf angles exceed 144 sq. ft., they are to be further braced by stiffeners.

The back of all "chases" or recesses (heads, jambs, mullions, etc.) shall be lined with Owens-Illinois Fiberglas Expansion Joint Strips – ½" thick x 4⅛" wide x 25" long, or approved equal. Ends of Strips shall be butted together to form a continuous cushion around the edges of the panel. They shall be installed before the block is laid and shall be held in place by an adhesive such as asphalt emulsion. After the panels have been laid and the mortar has set, ram non-staining oakum between the sides of the block and the sides of the "chase." Ram oakum back ⅜" from the finished surface. Fill recess thus formed with a non-hardening waterproof calking material to a depth of not less than ⅜".

Fiberglas Expansion Joint Strips are designed to keep the edges of the panels from coming into direct contact with the building structure and to eliminate the possibility of mortar gobs lodging in this expansion joint.

They must be so installed that they form a continuous cushion completely protecting the panel edges. One-half inch in thickness at jambs is sufficient for most buildings, but should be increased if excessive structural movement of the building may be expected due to light construction or extreme length. Additional clearance between the bottom of the strip and the top of the panel at the head is to be provided to take care of lintel deflection where necessary. Oakum must be rammed at the sides of the block and wedged tightly in order to support the panel against inward and outward wind pressure.

ALTERNATE — (Expansion Joints and Anchorage) – Expansion joints and anchorage may be provided for small panels as shown on the drawings. Fiberglas Strips or equal shall be fastened to head and jambs. They shall form a continuous cushion between the edges of the panel and the building structure. The panels shall be anchored at the jambs by 20-gauge perforated galvanized strips 1¾" x 24" imbedded in masonry and extended into horizontal glass block mortar joints. These shall be located as frequently as wall ties and shall be crimped at expansion joints. After mortar has set, rake out the edges of the Fiberglas Strips to a depth of at least ½" and bend the paper faces back into the joint. Point with gungrade waterproof calking material to a depth of at least ½". (If angles are used at the head of panels ram oakum between the sides of the panel and the legs of the angle and point with calking.)

This detail is not to be used for panels more than 80 sq. ft. or more than 8′ 0″ in height nor for any panel subject to severe winds such as in tall buildings. Anchors are to be crimped to allow for building and panel movement. Care must be taken to fit Fiberglas Strips tightly around these anchors to eliminate the formation of mortar droppings at these points. Expanded metal wall ties are not to be used as anchors. Interior and exterior stop angles are to be provided at the heads of all panels longer than 10′ 0″ – See details.

Specific variations are required for fire retardant panels (See page 21) and for panels erected under the jurisdiction of the Pacific Coast Building Officials Conference. (Available on request.)

Other variations in the above specifications may become advisable in some cases after a study of conditions pertaining to occupancy, processing, climate, etc., seem to warrant them. For suggestions, write the Owens-Illinois Glass Company, Toledo, Ohio, giving full particulars.

BUILDING CODES AND WIND PRESSURE TESTS

TEST DATA

OWENS-ILLINOIS
INSULUX
GLASS BLOCK

BUILDING CODES

For their recommended uses, Insulux Glass Block have met with acceptance by and approval of state and municipal building commissioners, including the Pacific Coast Building Officials Conference. The strength of individual units and panels, their wind resistance, their fire and hose stream resistance, and other essential physical properties have been demonstrated at Purdue, Columbia and Leland Stanford, Jr., Universities, the National Bureau of Standards and at the Underwriters' Laboratories, Chicago. These tests have been conducted in the presence of numerous building code authorities. Official approvals conforming to Owens-Illinois Glass Company's basic specifications (See Pages 18 and 19) have been secured from: Industrial Board, State of New York; Wisconsin State Industrial Commission; Building Department, District of Columbia; Building Department of Boston, New York, Chicago, Los Angeles, St. Louis and others.

West Coast approvals and that of the City of New York, due to local demands, require smaller maximum panel sizes and additional reinforcement. Existing local requirements for the use of glass block are available on request.

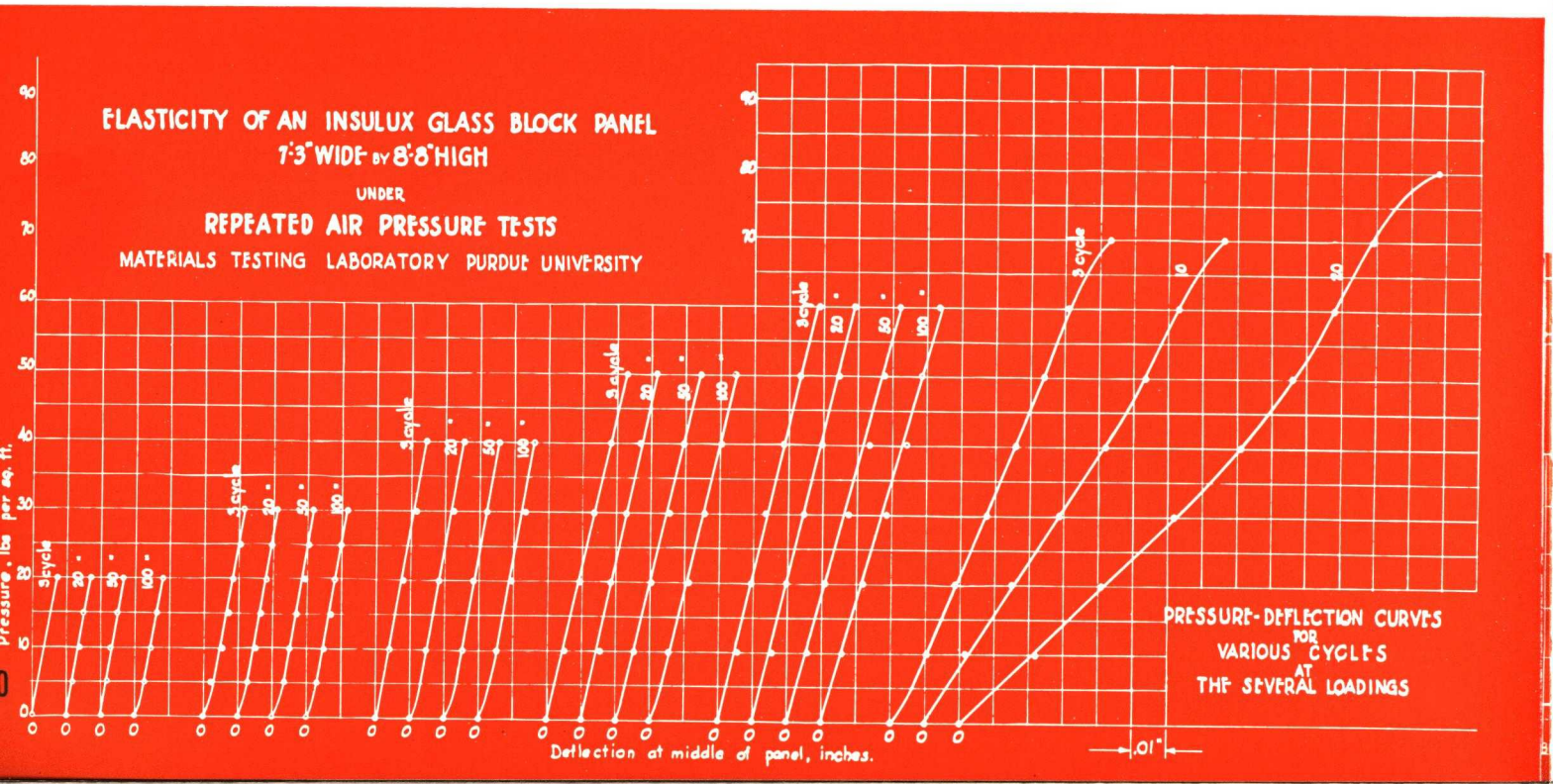
WIND PRESSURE TESTS

An Insulux Glass Block panel 7'-3" wide by 8'-8" high was built at Purdue University following standard specifications of Owens-Illinois Glass Company. This panel was tested by repeated applications of air pressure over one entire face. Pressure was applied and released intermittently for 100 cycles at each of the pressures of 20, 30, 40, 50 and 60 pounds per square foot.

Results of this test show that the panel is entirely elastic under repeated loadings with a pressure of 50 pounds per square foot, which corresponds to a wind velocity of about 112 miles per hour.

The panel withstood 50 cycles of pressure at 60 pounds per square foot before any minute permanent set was detected. After 100 cycles at 60 pounds pressure, visible checking of the mortar joints occurred. This pressure corresponds to a wind velocity of 122 miles per hour.

Final failure of the panel occurred with a pressure of 91 pounds per square foot which corresponds to a wind velocity of 150 miles per hour. Failure occurred in the mortar joints due to shear. The blocks were undamaged.

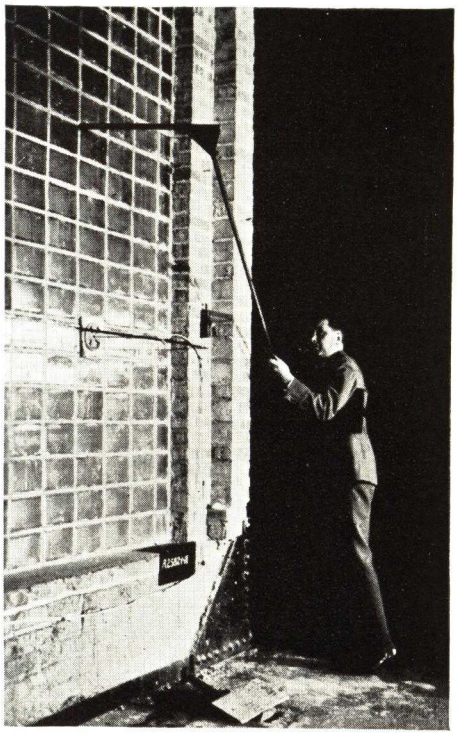


OWENS-ILLINOIS
INSULUX
GLASS BLOCK

TEST DATA

FIRE AND COMPRESSION TESTS

FIRE TEST



Operator making observations on Insulux panel during Underwriters' Fire and Hose Stream Test.

UNDERWRITERS' GUIDE CARD*

Guide No. 40 UM2.6.5. December 13, 1937 File R2582.

Owens-Illinois Glass Co., Mfr.,
Ohio Bldg., Toledo, Ohio.

Glass Blocks.

For window openings not exceeding 120 sq ft in area, nor 12 ft in width or height, subject to light fire exposure (Class F openings).

No. 1 Insulux hollow glass blocks, nominally 8 in. long, 4-⅞ in. wide, 3-⅞ in. thick; laid with ⅜-in. horizontal and vertical mortar joints; mortar consisting of one part portland cement, one part hydrated lime, and four parts silica sand by volume; each horizontal joint reinforced for full length with 20-gauge galvanized diamond mesh expanded metal; the glass block panels extending 3-½ in. into grooves 4-½ in. deep in jambs and lintels of the masonry openings, with loose mineral wool in the remaining spaces in the grooves, to provide for expansion of the glass panels; exterior jamb and lintel edges caulked with waterproofing mastic.

Marking: "INSULUX-1" molded on the inner surfaces of the blocks.

Listed—Reexamination Service.

See description of Reexamination Service on guide card.

Authorities having jurisdiction should be consulted before installation.

This card is issued by Underwriters' Laboratories, Inc.

*This type of construction may be called for in exterior walls by local fire insurance rating bureaus where fire exposure demands it, but it is not required on street fronts and in other locations of normal exposure.

FIRE TEST

Insulux Glass Block panels laid up in standard specification mortar and provided with specification bond ties have been subjected to both fire tests and fire and hose stream tests.

The panels were all rectangular but of varying dimensions in accordance with the requirements of the particular test specifications. The test furnaces were designed either according to the practice of the Underwriters' Laboratories and of the National Bureau of Standards, Department of Commerce, or of the New York State Department of Labor. The former were suitable for a test panel of approximately 120 square feet in area and the latter for typical window sizes.

Two time-temperature curves were followed in the tests, either that of the American Society for Testing Materials, or the New York State Department of Labor.

COMPRESSION TESTS ON INSULUX BLOCKS

Individual block bedded in Hydrocal, properly seasoned, were tested in compression at Purdue, Leland Stanford, Jr., and Columbia Universities. Values shown represent average strength of five specimens and are expressed in pounds per square inch on gross cross-sectional area. Blocks were in position as laid in wall.

Series	Ultimate Strength
100	1700
200	1990
300	2150
400	1660

COMPRESSION TESTS ON INSULUX PANELS

Insulux panels bedded in Hydrocal, properly seasoned, were tested in compression at Purdue and Leland Stanford, Jr., Universities. Panels were laid in accordance with basic specifications. Values are expressed in pounds per square inch on gross cross-sectional area.

Series	Panel Size		Ultimate Compression Strength
	Height	Width	
100	9 Blocks	3 Blocks	395
200	8 Blocks	4 Blocks	482
300	5 Blocks	4 Blocks	506
400	6 Blocks	3 Blocks	591

INSULATION, CONDENSATION AND INFILTRATION • RADIATION, LIGHT AND SOUND TRANSMISSION • EXPANSION

TEST DATA

OWENS-ILLINOIS INSULUX GLASS BLOCK

THERMAL INSULATION

Tests conducted by Purdue University using the guarded hot plate method give the conductance of a panel of Insulux at mean temperature 61° F. to be C=0.79 B.T.U. per hour, per square foot, per degree temperature difference. Using an inside surface coefficient of 1.65 and an outside surface coefficient of 6.00, the over-all coefficient from air to air of an exterior Insulux wall becomes:

U=0.49 B.T.U. per hour, per square foot, per degree temperature difference.

For a panel in still air and using ribbed block, this coefficient becomes:

Ribs vertical U=0.40 B.T.U. per hour, per square foot, per degree.

Ribs horizontal U=0.31 B.T.U. per hour, per square foot, per degree.

(This value .31 obtained by the accurate hot plate method closely approximates the generally used .29 value obtained by the hot box method.)

CONDENSATION AND INFILTRATION

Using the above value of U=0.49 for Insulux and the accepted value of U=1.13 for steel sash, the following outside temperatures are necessary to produce condensation on the inside of the building with the inside air at 70° F. and a relative humidity of 40 percent.

Insulux	−14.2° F.
Steel Sash	+33.5° F.

"Because the standard method of erecting Insulux is to lay it up in mortar with caulked expansion joints at jambs and head, air infiltration is reduced to a minimum. This reduction aids materially in reducing heat loss and maintaining desirable interior conditions of temperature and humidity."

SOLAR RADIATION

Because of their variable values of controlled light transmission, due to the variety of available face patterns, INSULUX Glass Block can be employed to reduce materially solar heat transmission as compared to a single-glazed window. Purdue University authorities, at the conclusion of elaborate tests on the solar heat transmission of INSULUX as compared with steel sash (testing equal areas of both materials), say: "The glass block No. 201 (Pattern No. 1) permitted 38.3 percent less solar heat to pass than did the steel sash when exposed continuously to the sun; 37.7 percent less when exposed to the east; 51.5 percent less when exposed to the south; and 52.2 percent less when exposed to the west." Comparatively, they further point out that steel sash eliminates an average of but 20.4 percent of the solar heat.

In computing the cooling load for any actual installation, consult the Owens-Illinois Glass Company for B.T.U. transmission figures.

LIGHT TRANSMISSION

Photometric measurements made by Purdue University using a diffused source of light show that the transmission for single blocks, when the light falls perpendicular to the surface, is as follows:

Pattern No.	Percent of Incident Light Transmitted
1	78.5
2	73.4
7	84.4
11	86.5
16	84.4
17	84.0

TEST OF SOUND TRANSMISSION

Tests conducted in the Sound Chamber of the National Bureau of Standards showed an average sound reduction factor over a range of nine frequencies of 40.7 decibels. Similar tests by the same authorities give a comparative value for clay tile partitions:

4" Hollow Clay Tile, plastered both sides . . 42.1

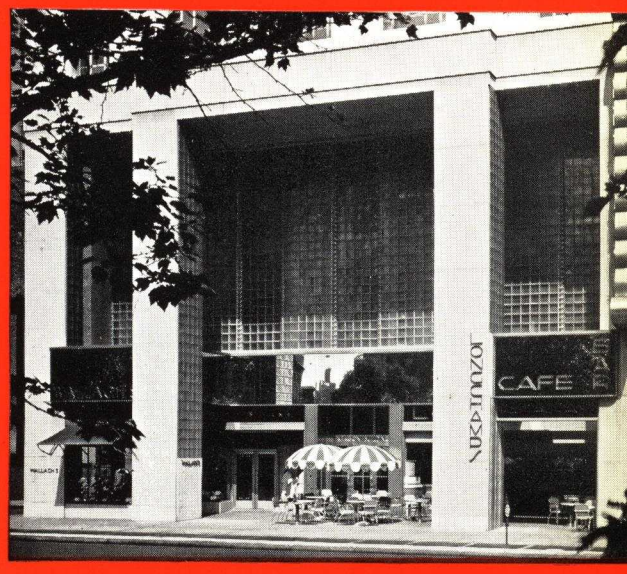
COEFFICIENT OF THERMAL EXPANSION

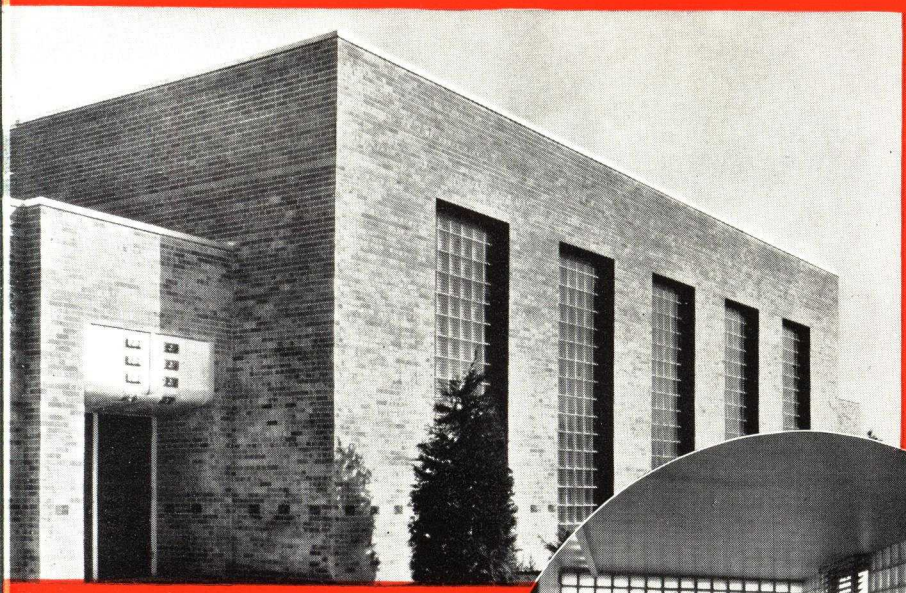
The lineal coefficient of thermal expansion for Insulux laid with 4 types of mortar was determined by Purdue University to have an average value over a range between 10° F. and 150° F. as follows:

Kind of Mortar	Average Coefficient
Portland Cement and Hydrated Lime 50/50	.00000467
Masonry Cement No. 1	.00000443
Masonry Cement No. 2	.00000440
Masonry Cement No. 3	.00000450
Average	.00000450

● Miles Laboratories, Inc., Elkhart, Ind. Frank Randall, Architect.

● Paragon Bldg., New York City. Eli Jacques Kahn, Architect.



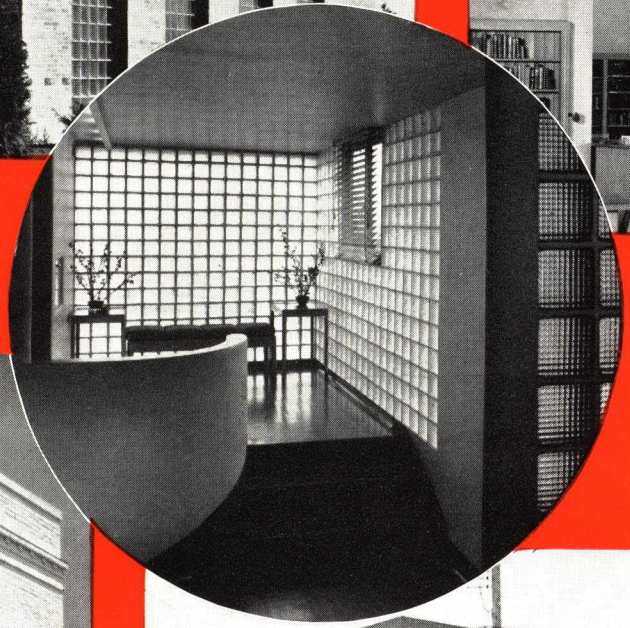


● Underwood School, Milwaukee, Wisc., Clas & Clas, Inc., Architects, Charles C. Reynolds, Associate Architect.

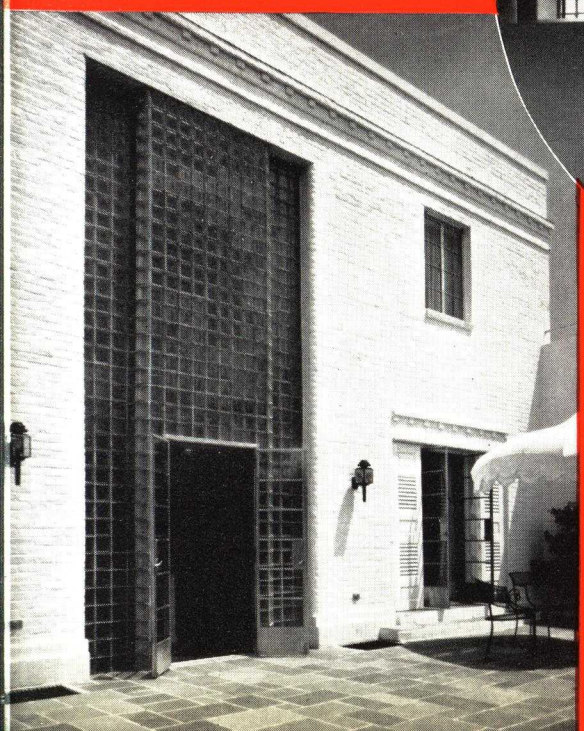
● McCaskey High School, Lancaster, Pa. Henry Y. Schaub, Architect.

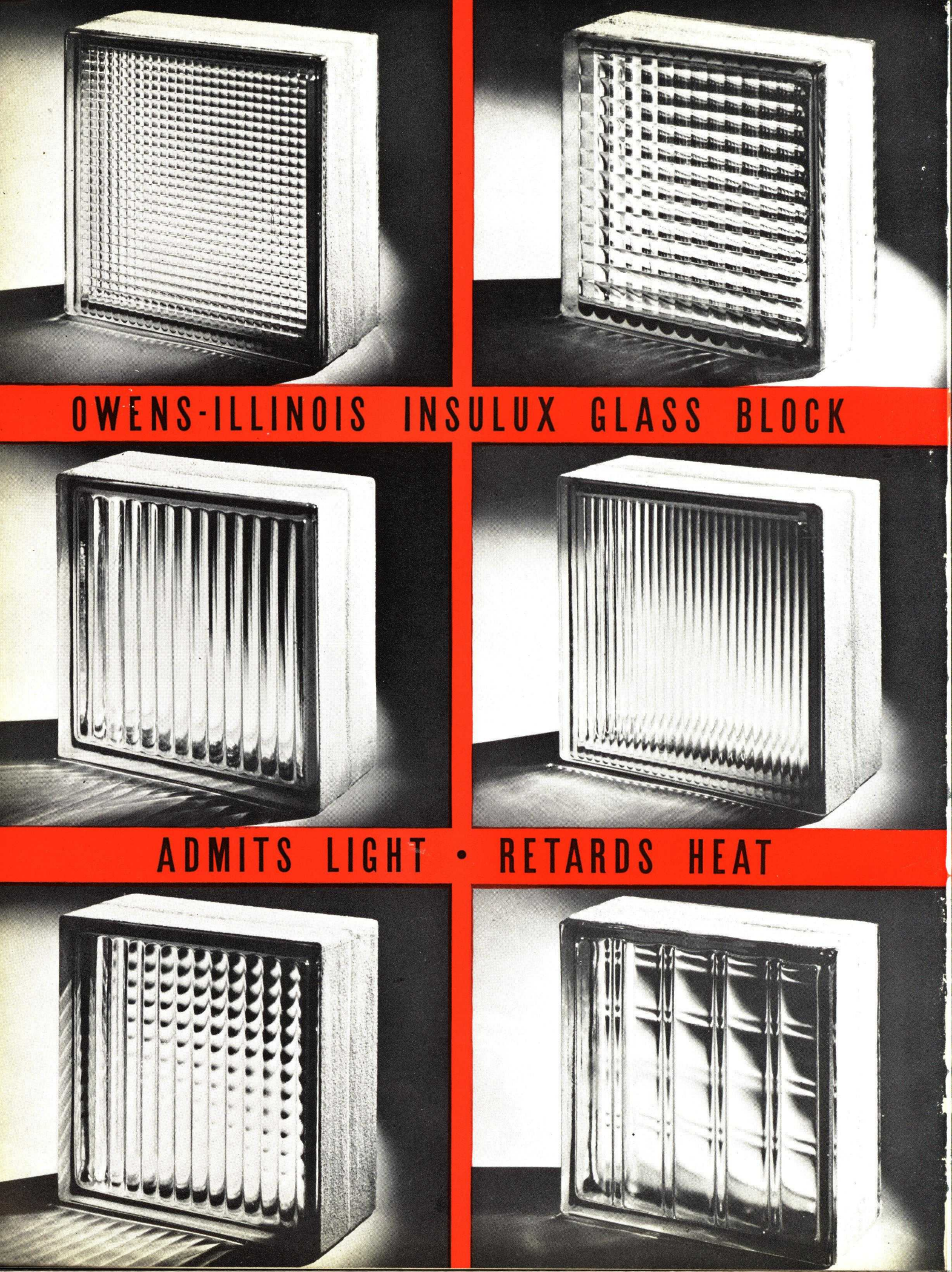
● Bromfield Residence, Denver, Colo. . Burnham Hoyt, Architect.

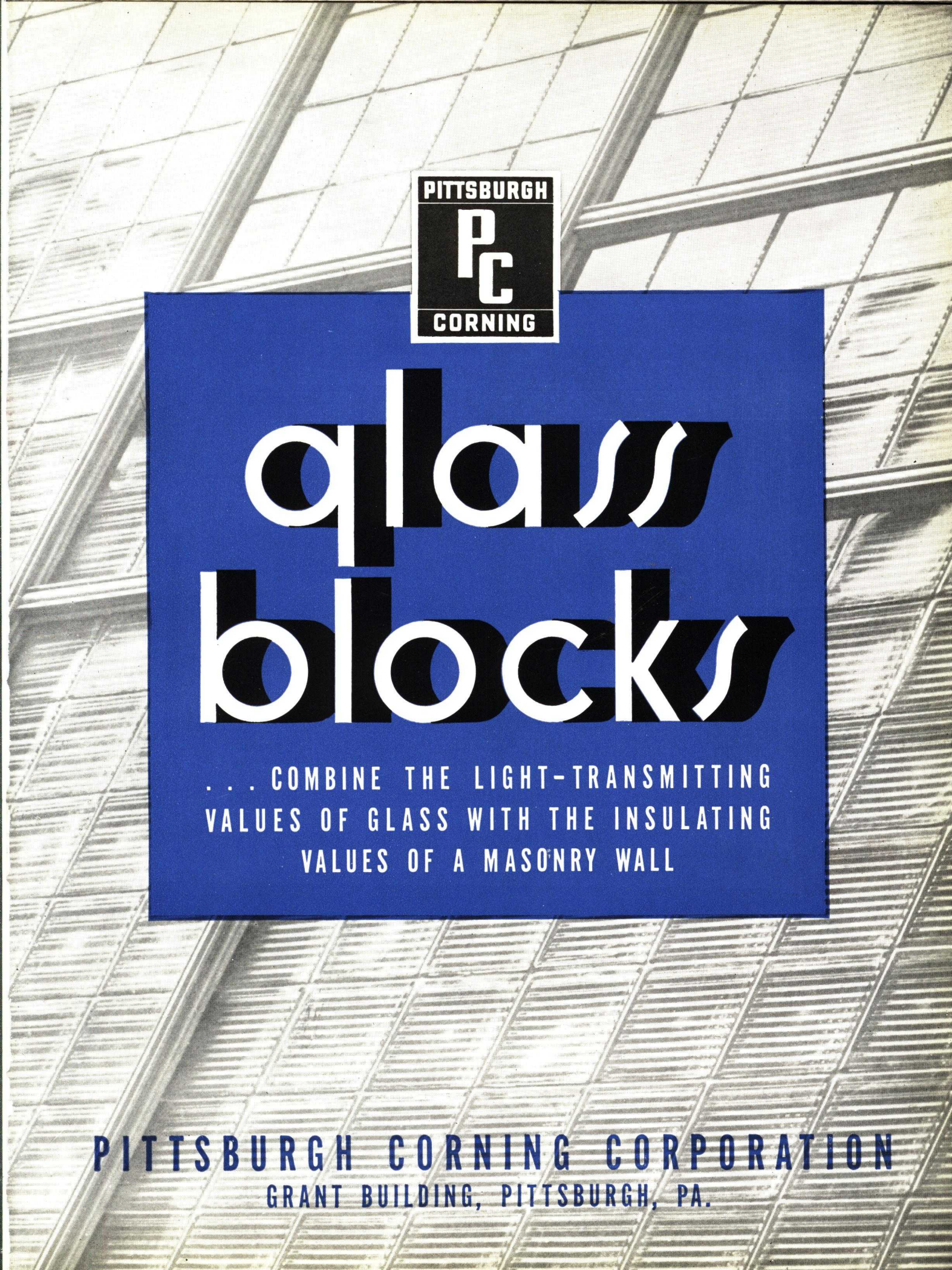
● Radio Station WGY, Schenectady, N.Y Harrison & Fouilhoux, Architects.



● House & Garden Ideal Home, Scarsdale, N. Y. Julius Gregory, Architect.

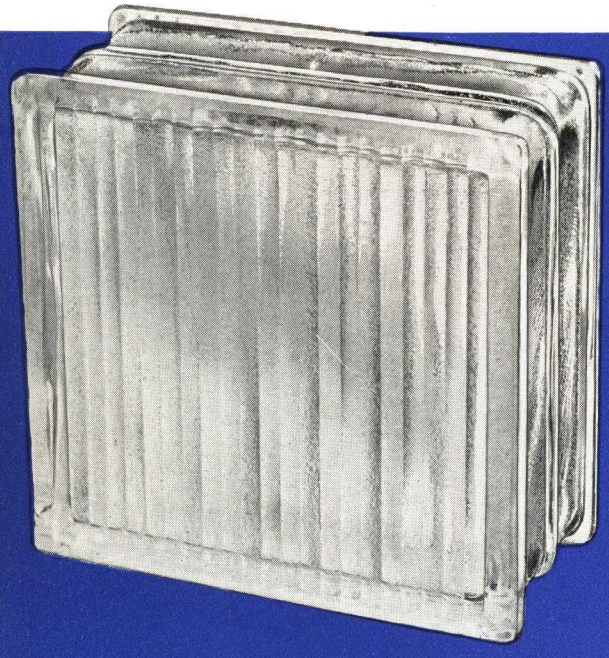



OWENS-ILLINOIS INSULUX GLASS BLOCK
ADMITS LIGHT • RETARDS HEAT


PITTSBURGH
PC
CORNING
glass
blocks
. . . COMBINE THE LIGHT-TRANSMITTING
VALUES OF GLASS WITH THE INSULATING
VALUES OF A MASONRY WALL
PITTSBURGH CORNING CORPORATION
GRANT BUILDING, PITTSBURGH, PA.

DECORA PATTERN

SIZES: 6", 8", 12"



SAXON PATTERN

PITTSBURGH PC CORNING

Glass Blocks

. . . from the combined facilities and research of the world's foremost manufacturer of technical glass and its greatest producer and distributor of flat glass products.

Pittsburgh Corning Corporation, a subsidiary formed by the Corning Glass Works and the Pittsburgh Plate Glass Company, unites the research and facilities of these two famous glass companies. This new corporation specializes in the development and manufacture of glass blocks, structural glass and related products. Its large staff of experts focuses its attention not only on improvement of the products themselves, but also on the dissemination among the building industry of useful and authoritative data on glass.

RESEARCH FACILITIES

For more than three years many groups of men in the factories and the laboratories of the Corning Glass Works and the Pittsburgh Plate Glass Company have been painstakingly studying all aspects of glass block design, fabrication and performance. Where it has seemed necessary or desirable the assistance of independent investigators and testing laboratories has been utilized. Among these have been the following:

The Mellon Institute of Industrial Research
The Carnegie Institute of Technology
The University of Minnesota
Pittsburgh Testing Laboratories
Electrical Testing Laboratories
Riverbank Laboratories

WHY

SPECIFY PC GLASS BLOCKS

The combined technical skill and manufacturing facilities of these two great glass companies have produced in PC Glass Blocks a product of technical excellence and beauty. Here are some **exclusive** PC features that it will pay you to consider before choosing the glass blocks for the building you design.

1. PC Glass Blocks are made of clear, colorless glass of proven durability. The light which streams through them is of full daylight tone, requiring no special consideration in the matching of colors, either for decoration or production uniformity.

2. PC Glass Blocks are hollow "all glass" units with fused seals made at high temperatures, free of entrapped water vapor. This feature was developed by our engineers so that PC Glass Blocks will remain tightly sealed. Because of this patented method of "all glass" construction, the seal has the same coefficient of expansion as the block itself. The joint is as strong as any other part of the block. This tight seal insures a dry, dead air space within the block, which is so important to efficient heat insulation. No other glass block embodies this important feature.

3. PC Glass Blocks have all-glass mortar edges coated with grit-bearing water- and alkaline-resistant plastic coating. This forms a permanent bond between glass and mortar, which insures a high degree of wind resistance and weather-tightness. Voids in mortar joints are a chief cause of leaky walls. The mason can prevent this trouble by using care in completely filling all mortar joints.

4. PC Glass Block edge construction forms a "key-lock" mortar joint, providing a full bed of mortar, yet permitting a visible joint of only about ¼ inch, resulting in a trim panel that is pleasing to the eye. And this "key-lock" joint is easier to handle in laying.

These are all features that assure consumer satisfaction. Better color — neater appearance in panels — greater durability — all are important. All of them guard the investment of the final consumer — and the reputation of those who have recommended and installed the material.

At present there are four patterns to choose from. For sizes and shapes of these styles, see page 6 of this section.

ARCHITECTURAL SERVICE

The Pittsburgh Corning Corporation maintains an able staff of field consultants and glass experts. Architects everywhere are invited to take full advantage of the cooperation and advice these men can extend in connection with problems involving these products. Complete engineering and specification service is provided on all Pittsburgh Corning products. Communications addressed to Pittsburgh Corning Corp., Grant Bldg., Pittsburgh, Pa., or to any branch of the Pittsburgh Plate Glass Co. will receive prompt attention.

DISTRIBUTION FACILITIES

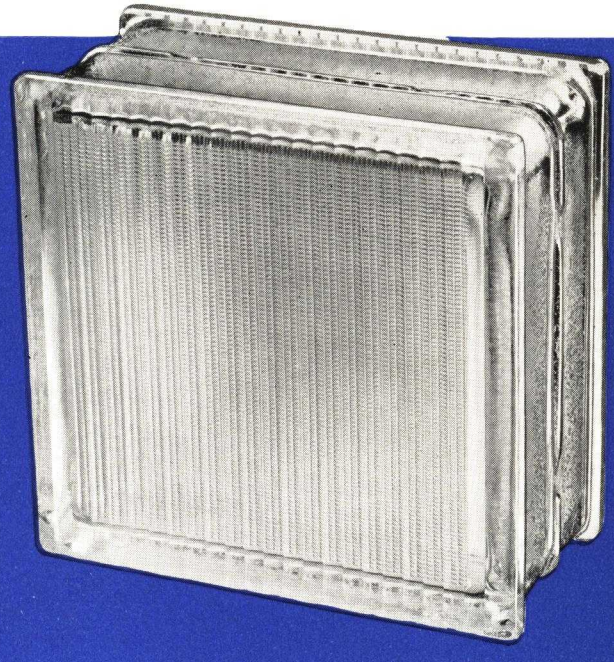
PC Glass Blocks are distributed through the warehouses of the Pittsburgh Plate Glass Company, the branches of W. P. Fuller & Co. on the Pacific Coast, and through selected dealers. Pittsburgh warehouses are located in the principal trading centers throughout the country, and form a complete network of fully-stocked headquarters, with unequalled facilities for rendering prompt and efficient service to the building trades, no matter where located. For a complete list of these chief distribution centers, see the list on page 16 of this section.

PITTSBURGH CORNING CORPORATION

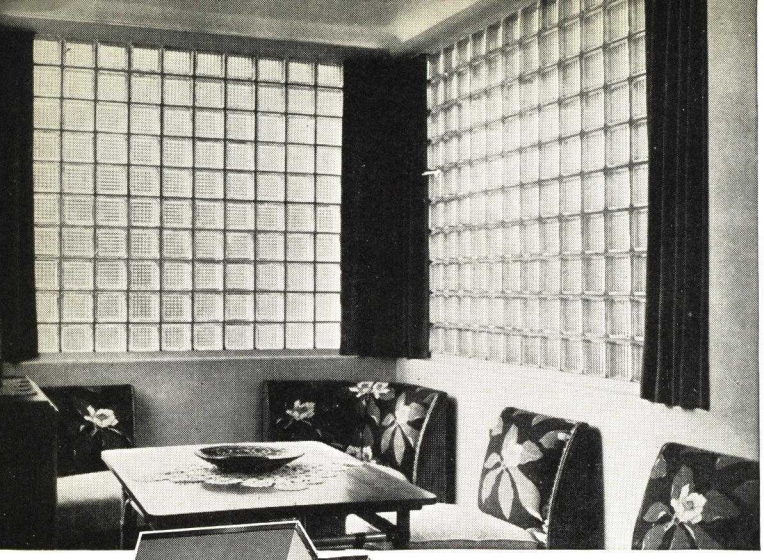
Grant Building **Pittsburgh, Pa.**

ARGUS PATTERN

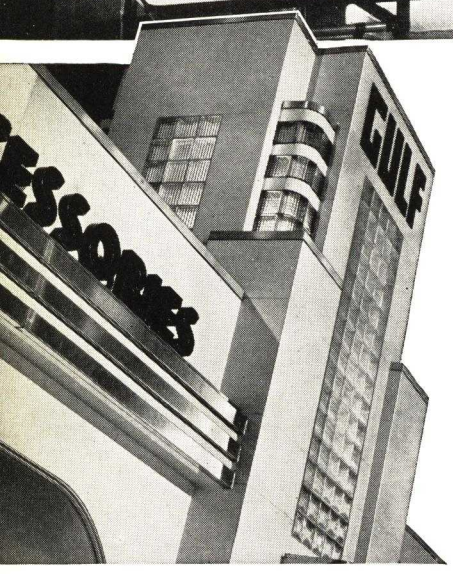
SIZES: 6", 8", 12"



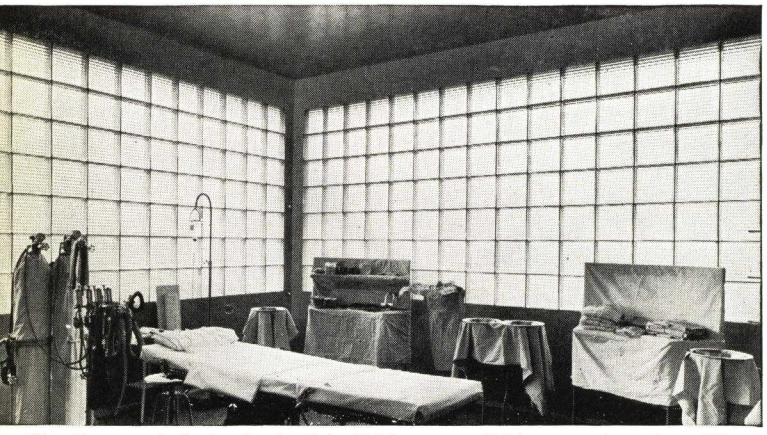
BALTIC PATTERN



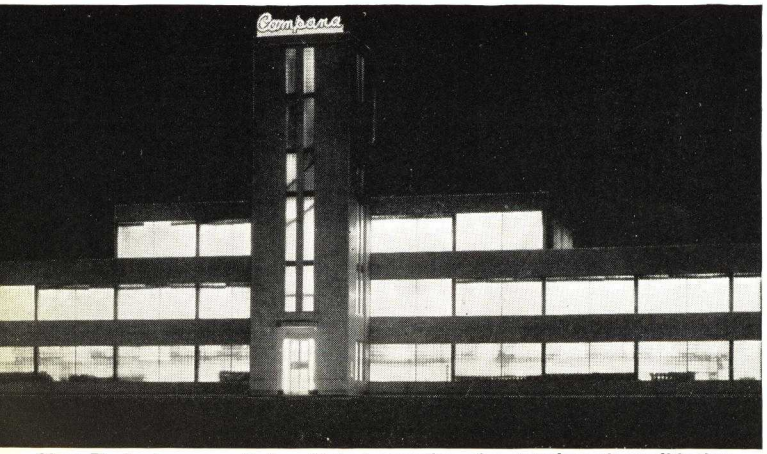
Above — This delightful corner would be welcome in anybody's home. Large areas of light-transmitting glass need not cause high heat loss or discomfort. When PC Glass Blocks are used both light and insulation are provided.



Crystal-clear PC Glass Blocks enhance the trim design of this attractive service station. At night, colored light streams through the blocks to attract the eye of many a motorist.



Cleanliness and plenty of natural daylight are essential here—so they chose PC Glass Blocks. PC Glass Blocks are an important aid to hospital air-conditioning.



Glass Blocks here permit the efficient operation of a complete air-conditioning system. Heat loss in winter and heat gain in summer are kept at a minimum, even on those huge light-transmitting areas.

4/39

Advantages OF PC GLASS BLOCK CONSTRUCTION

No other single building material offers all these important advantages

Wherever glass blocks are used you can see at a glance the important advantages of abundant light and improved appearance. And more important in many buildings, are the real dollars and cents economies that this new material effects in building management and maintenance. PC Glass Blocks combine in a single unit the insulating values of a masonry wall with the beautiful and light-transmitting values of glass. That's why glass blocks are being used in so many buildings today. And you will see more and more glass blocks in use in almost every type of building in the years to come. Here are 9 reasons for the superiority of glass block construction.

MORE DAYLIGHT

Today, bright, cheerful rooms are in demand for up-to-date homes. And in stores and factories better lighting has long proved itself an important factor in increasing sales and improving production efficiency. Better lighting adds to safety, too, and provides eye-comfort. People like daylight—they like to work in it—they like its quality and its cheerful effect. With PC Glass Blocks you get an abundance of diffused daylight. And with far less solar heat transmission than you would experience with equal areas of single-glazed sash.

IMPROVED APPEARANCE

Homes that have the smart, up-to-date appearance of glass blocks are easier to sell. Attractive, well-lighted stores get the business that dull, unattractive stores lose. Factories that are well-kept and efficient-looking rate better in public opinion—and rate better with employees, too. People like a cheerful, clean-looking building, whether they live there, work there, or come to buy there. PC Glass Blocks are well suited for use with other decorative materials. In themselves they are an interesting and flexible decorative medium.

BETTER HEAT INSULATION

Whether you are concerned with heating or cooling, glass blocks help answer the problem of heat control where large light areas are desired. For PC Glass Blocks have less than half the heat loss factor of ordinary single-glazed window areas—even less than that of double-glazed openings. In every PC Glass Block there is a dead-air space between the two surfaces of glass. This is an effective, sealed-in heat retardant that saves money.

Thus temperature control and humidity control are much easier and less costly. Heating costs are reduced in cold weather. Air-conditioning systems are more efficient when light areas are built with PC Glass Blocks, for their low heat-loss factor materially reduces the load on air-conditioning equipment.

LESS SURFACE CONDENSATION

Where surface condensation on window areas is a problem, the use of glass blocks often proves advantageous. For moisture does not condense on the warm side of a PC Glass Block panel except under unusually severe temperature and humidity conditions. Consequently, glass block panels stay cleaner, too.

DIRT INFILTRATION ELIMINATED

In plants where foods, finely machined parts, or delicate fabrics are produced—in restaurants, hotels or shops visited by a fastidious public—in homes where cleanliness is treasured . . . PC Glass Blocks are an ideal source for daylight. For harmful dirt and grit can't filter through panels of glass blocks. This is especially important in regions where the atmosphere is smoky or dusty. Glass blocks likewise keep out gases that may be offensive or may cause deterioration of equipment.

EASIER TO CLEAN

A whole panel of glass blocks is cleaned as one unit—not a small panel at a time. No mullions to clean—just a simple sweep of one smooth glass-and-cement area. Many maintenance men have found that satisfactory cleaning can be done simply by one man with a hose, and a long-handled brush.

The translucent effect of glass block panels keeps them looking clean long after ordinary clear glass looks spotty or streaked from dirt particles. PC Glass Blocks are designed to stay cleaner —for there are no places to catch dirt on outside or inside surfaces—no place for corrosive or bacteria-laden moisture to collect.

LOWER MAINTENANCE COSTS

With PC Glass Block panels for light-giving wall areas or partitions, maintenance costs are almost non-existent. No unsightly and dangerous corroded or rotted sash need be replaced. No costly and slow painting to be done. Once installed, the solid panel of glass and strong, clean mortar joints practically takes care of itself.

PC Glass Blocks make a permanent type of panel. Glass blocks are not easily marred or broken. Should replacement of an individual block be required, it can be done easily by a regular mason.

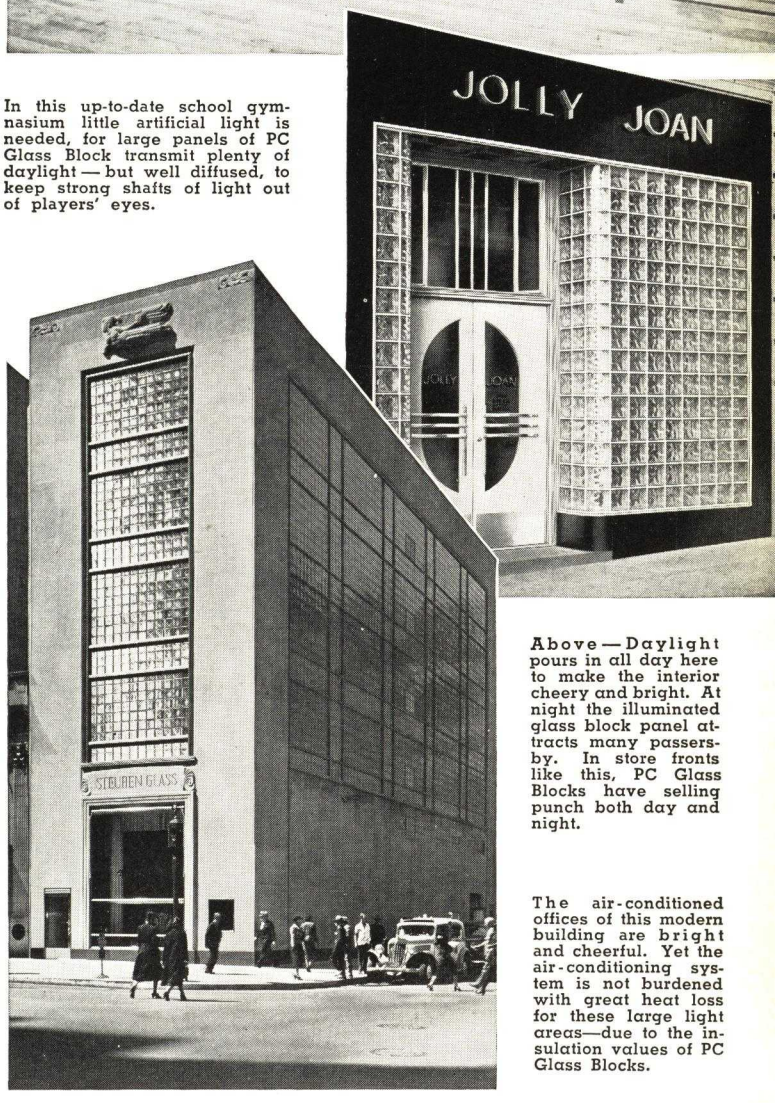
PRIVACY

Translucent glass blocks admit well-diffused streams of light—but they guard privacy. Unsightly views can be eliminated. Distracting views are shut off. There is greater concentration of vision on the things you want seen.

EFFECTIVE SOUND INSULATION

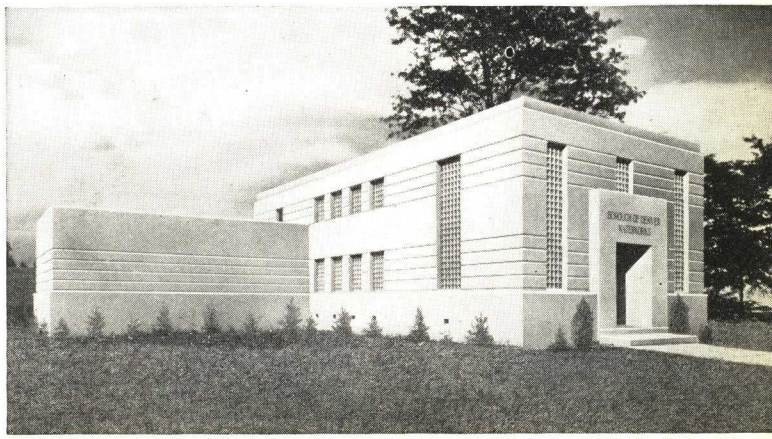
Glass block panels substantially reduce distracting and undesirable noise. Even in noisy factory surroundings, offices can have quiet and privacy. With glass blocks, homes or stores on busy corners can shut off the clatter from the street.

In this up-to-date school gymnasium little artificial light is needed, for large panels of PC Glass Block transmit plenty of daylight — but well diffused, to keep strong shafts of light out of players' eyes.



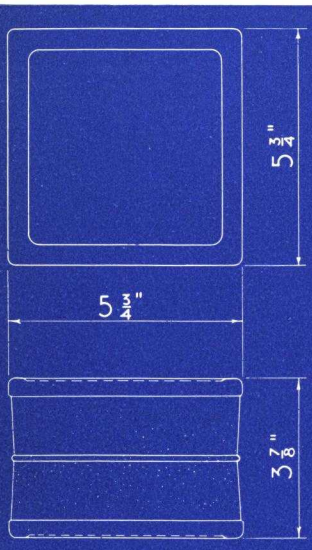
Above — Daylight pours in all day here to make the interior cheery and bright. At night the illuminated glass block panel attracts many passers-by. In store fronts like this, PC Glass Blocks have selling punch both day and night.

The air-conditioned offices of this modern building are bright and cheerful. Yet the air-conditioning system is not burdened with great heat loss for these large light areas—due to the insulation values of PC Glass Blocks.

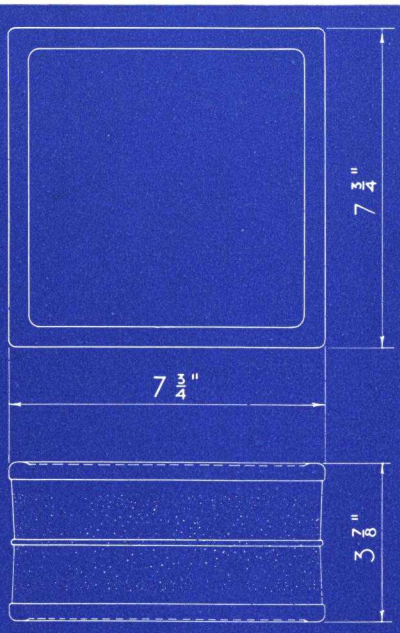


In this modern building glass blocks provide an abundance of light, but still provide good insulation. And PC Glass Blocks make it attractive both inside and out.

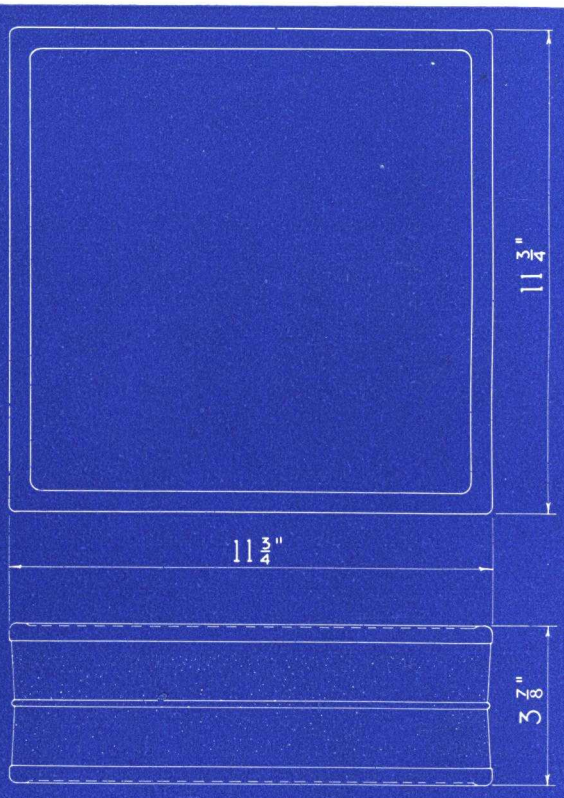
STANDARD TYPES · SIZES · PATTERNS



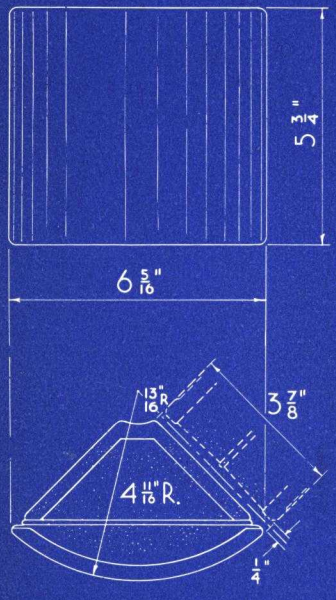
5¾" STANDARD



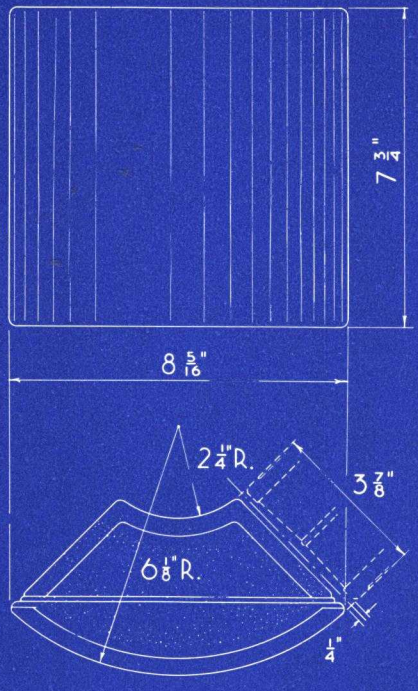
7¾" STANDARD



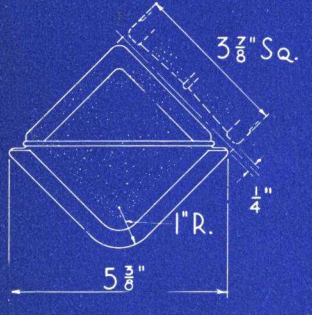
11¾" STANDARD



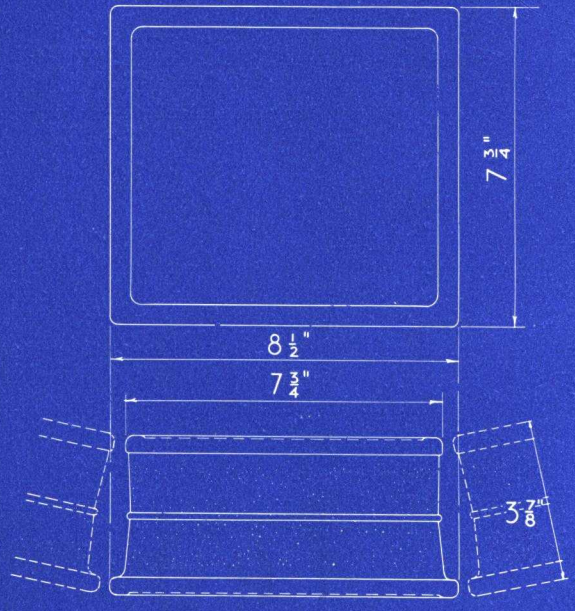
5¾" CORNER BLOCK



7¾" CORNER BLOCK



BULLNOSE BLOCK
HEIGHT 5¾" & 7¾"



7¾" RADIAL BLOCK

AVAILABLE PATTERNS

	Argus	Baltic	Decora	Saxon
5¾" Standard Block	X	X	X	X
7¾" Standard Block	X	X	X	X
11¾" Standard Block	X	X	X	X
5¾" Corner Block	X		X	
7¾" Corner Block	X		X	
7¾" Radial Block	X		X	
5¾" Bullnose Block	X		X	
7¾" Bullnose Block	X		X	

NOTE: The 5¾", 7¾" and 11¾" Standard Blocks, the 5¾" and 7¾" Corner Blocks, the 7¾" Radial Blocks and the 5¾" and 7¾" Bullnose Blocks are commonly referred to as 6", 8" or 12" blocks of their respective types.

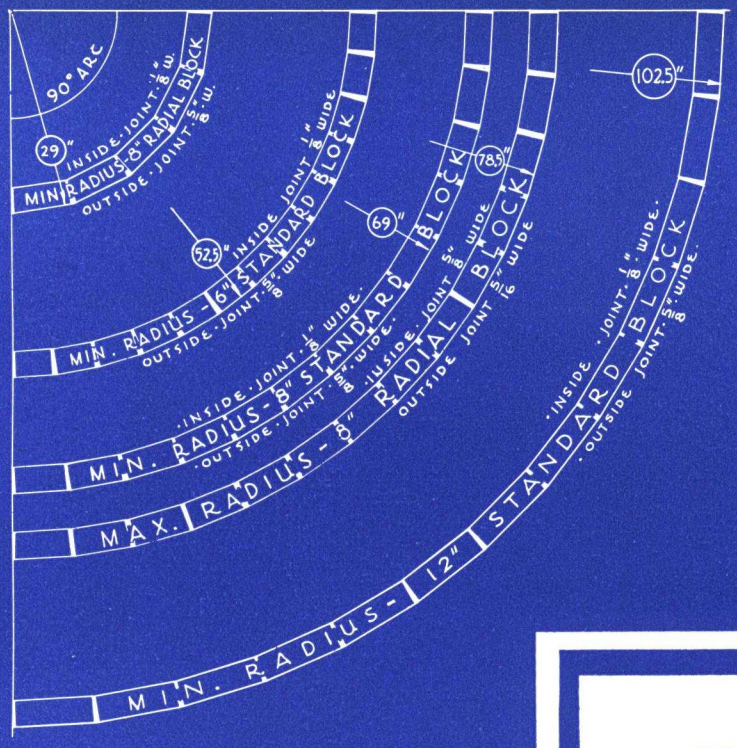


DIAGRAM and TABLE Showing Limitations of PC Standard and Radial Glass Blocks for Curved Panels

PITTSBURGH PC CORNING

Glass Blocks

NOTE: Available in two patterns—ARGUS and DECORA.

Outside Radius Inches	Number of Block in 90° Circular Arc	Joint Thickness in Inches		Remarks
		Inside	Outside	
	6" STANDARD BLOCK			
52-1/2	13	1/8	5/8	Minimum
56-1/4	14	1/8	9/16	
56-3/4	14	3/16	5/8	
60	15	1/8	9/16	
61	15	3/16	5/8	
63-3/4	16	1/8	1/2	
65	16	1/4	5/8	
67-1/2	17	1/8	1/2	
69	17	1/4	5/8	
71-1/4	18	1/8	7/16	
73	18	5/16	5/8	
No Maximum Limitations.				
	8" STANDARD BLOCK			
69	13	1/8	5/8	Minimum
74	14	1/8	9/16	
74-3/4	14	3/16	5/8	
79	15	1/8	1/2	
80	15	1/4	5/8	
84	16	1/8	1/2	
85-1/4	16	1/4	5/8	
No Maximum Limitations.				
	8" RADIAL BLOCK			
29	5	1/8	5/8	Minimum
34	6	1/8	3/8	
34-3/4	6	3/8	5/8	
39	7	1/8	1/4	
40-3/4	7	1/2	5/8	
44	8	1/8	1/8	
46-1/2	8	5/8	5/8	
49-1/2	9	3/16	1/8	
51-3/4	9	5/8	9/16	
55	10	1/4	1/8	
57-1/4	10	5/8	1/2	
60-1/2	11	5/16	1/8	
62-1/2	11	5/8	7/16	
66	12	3/8	1/8	
67-3/4	12	5/8	3/8	
71-1/2	13	3/8	1/8	
73-1/4	13	5/8	5/16	
76-3/4	14	7/16	1/8	Use Standard Block
78-1/2	14	5/8	5/16	For larger radii
	12" STANDARD BLOCK			
102-1/2	13	1/8	5/8	Minimum
No Maximum Limitations.				

NOTE: Radii given to closest quarter inch; joint thicknesses to closest sixteenth inch.

TECHNICAL DATA

THERMAL INSULATION

Glass blocks have a definite advantage over single-glazed window light construction in the matter of greater heat insulation efficiency. This is due largely to the sealed-in dead-air space within the blocks. The insulation value of this dead-air space is safeguarded in PC Glass Blocks by the all-glass seal. Tests on PC wall panels laid up in typical manner gave the following overall coefficient of heat transfer:

	Block Sizes 6"	8"	12"
Overall coefficient of heat transfer—still air—U—	.42	.40	.40
Overall coefficient of heat transfer—corrected to 15 m.p.h. wind—	.55	.54	.48

The above values apply to all PC patterns and types.

SURFACE CONDENSATION

Tests on PC Glass Block panels show that condensation will not start to form on the interior (room) surfaces unless the outdoor temperature is very low or the indoor relative humidity unusually high. The chart below shows to what extent PC Glass Blocks resist condensation.

	Indoor Conditions		Condensation Starts At and Below Outdoor Temp. —°F.	
Service	T.—°F.	R.H.—%	No Wind	Strong Wind
Ordinary Un-air-conditioned Buildings	72	35	—38	0
Air-conditioned Buildings	70	50	— 6	20
Special High Humidity Industries (Tobacco, Silk, etc.)	75	60	—17	34

It is readily seen from these figures that glass block construction is advantageous where wide fluctuations of temperature and humidity occur, especially in buildings where manufacturing processes cause or require a high and constant humidity. A comparison of the above figures with similar condensation data for single windows shows the superiority of glass block construction where the condensation problem must be considered.

LIGHT TRANSMISSION

Tests on individual PC Blocks have been made in a sphere-photometer to determine the over-all transmission of light through the block faces. This tes which most closely approximates service conditions, gives the following figures:

	Transmission through Individual Units	Transmission through Laid-up Panels
Argus	74.2%	50 to 55%
Baltic	59.0%	42 to 45%
Decora	73.5%	50 to 55%
Saxon	72.2%	50 to 55%

These figures mean that individual blocks and panels will transmit these percentages of the light falling on them.

By the use of refracting and reflecting patterns on the blocks it is possible to decrease the light transmission through individual blocks to approximately 25%. By other changes in the patterns it is possible to increase or decrease the degree of light diffusion within wide limits. Special patterns to produce these results are being studied.

SOLAR HEAT TRANSMISSION

Glass block panels will transmit from 50 to 60 per cent of solar heat energy, depending upon joint widths, glass composition and face cuttings, as compared with the approximately 80 per cent transmitted by single-glazed sash.

SOUND INSULATION

Glass block panels have better sound insulating properties than other forms of masonry construction having equal weight per unit surface area, and are decidedly superior to single-glazed sash. They will improve the acoustics of rooms in which they are used to replace the latter. Tests give sound reduction factors for glass block panels from 37.6 to 42.0 decibels.

CRUSHING STRENGTH

Glass block construction should never be used for load-bearing walls or panels. However, it is necessary that the individual blocks have ample strength to resist the forces which are created by conditions within the masonry construction itself.
Repeated tests on individual PC Blocks have established their strength at 1500 lbs. per sq. inch of gross loaded area—when the blocks are tested on edge. Similarly made tests on 32-inch square wallettes laid up with 8-inch PC Blocks show a panel compressive strength of 400 lbs. per sq. inch of gross loaded area.

BOND STRENGTHS

PC Blocks have a special grit-bearing, moisture-and-alkaline-resisting, translucent coating on all mortar edges. This insures a complete and permanent bond between the glass and the cement mortar and provides a panel construction having a high degree of wind resistance and water-tightness. Tests have established the following values for bond strengths:

Shear-bond .....200 lbs. per sq. in. (28 days)
Tension-bond ..... 40 lbs. per sq. in. (28 days)
Modulus of rupture-bond...160 lbs. per sq. in. (28 days)

WIND RESISTANCE

Tests have demonstrated that panels as large as 100 sq. ft. in area will carry a load of 80 lbs. per sq. ft. distributed uniformly over the surface. This is equivalent to a wind velocity of about 160 m.p.h.

WATER-TIGHTNESS

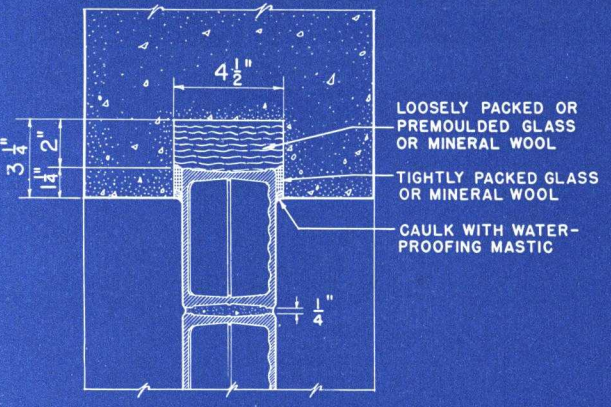
Tests in which large panels of PC Blocks have been subjected to a wind driven (15 m.p.h.) water spray for eight hours, followed by 16 hours of spray without wind, showed that the panels were capable of withstanding severe conditions of storm exposure without penetration. It should be emphasized, however, that water-tightness in any masonry construction is dependent upon proper workmanship in the jointing. It is essential that the mason use care in packing all mortar joints completely to prevent possible leakage through voids in the mortar joints.

WEATHERING RESISTANCE

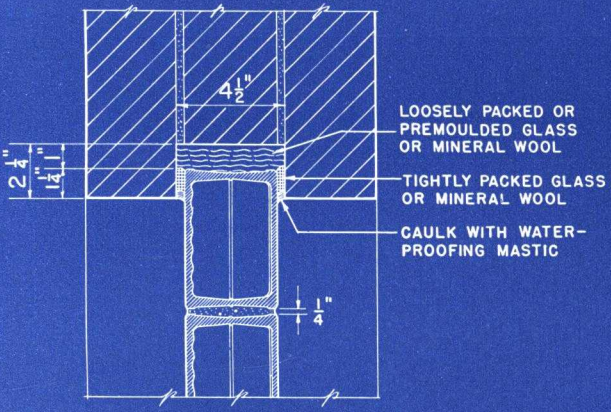
For more than a year many full-scale panels of PC Glass Block construction have been subjected to accelerated weathering tests to determine the effects of extreme cold, heat, wetness, and dryness. Temperatures well above and below those encountered in any type of service have been used. These temperatures have been applied to panels in a completely dry state as well as to those which have been thoroughly soaked with a wind-driven water spray. All of this work shows conclusively that PC Glass Block panels built according to our recommendations are extremely rugged and will withstand all possible combinations of weathering attacks.

PITTSBURGH PC CORNING

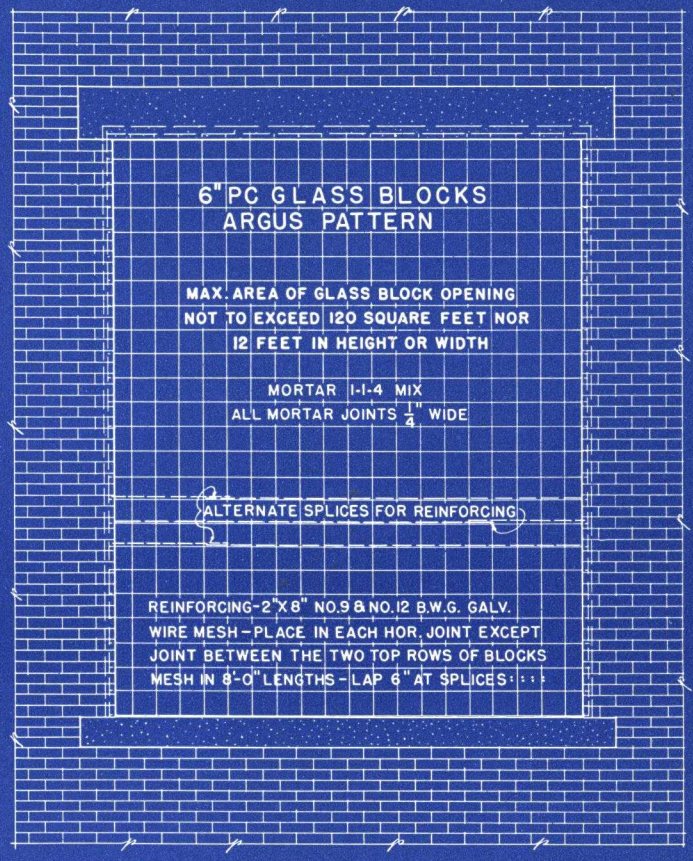
Glass Blocks Approved by UNDERWRITERS' LABORATORIES, INC. Chicago, Ill.



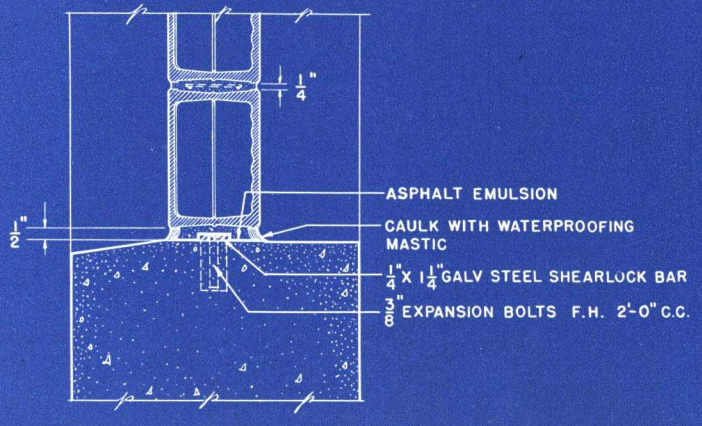
HEAD DETAIL



JAMB DETAIL



TYPICAL ELEVATION OF PC GLASS BLOCK FIRE PANEL FOR CLASS "F" OPENINGS....



SILL DETAIL

DESCRIPTION OF CONSTRUCTION OF PC GLASS BLOCK FIRE PANELS AS APPROVED

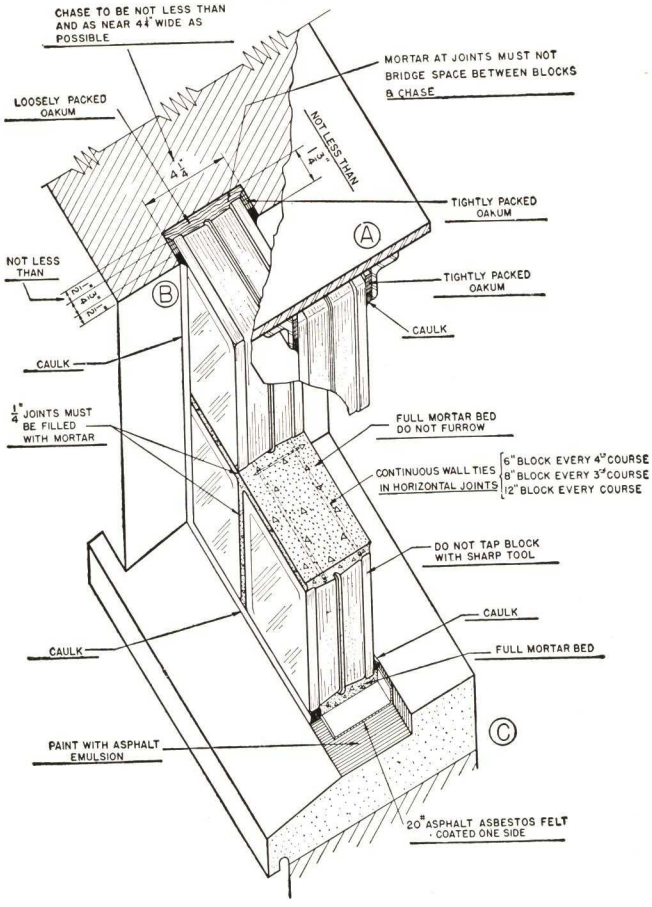
Guide No. 40 UM 2.6.5 **June 30, 1938** **File R2556**

FOR window openings not exceeding 120 sq. ft. in area nor 12 ft. in width or height, subject to light fire exposure (Class F openings).

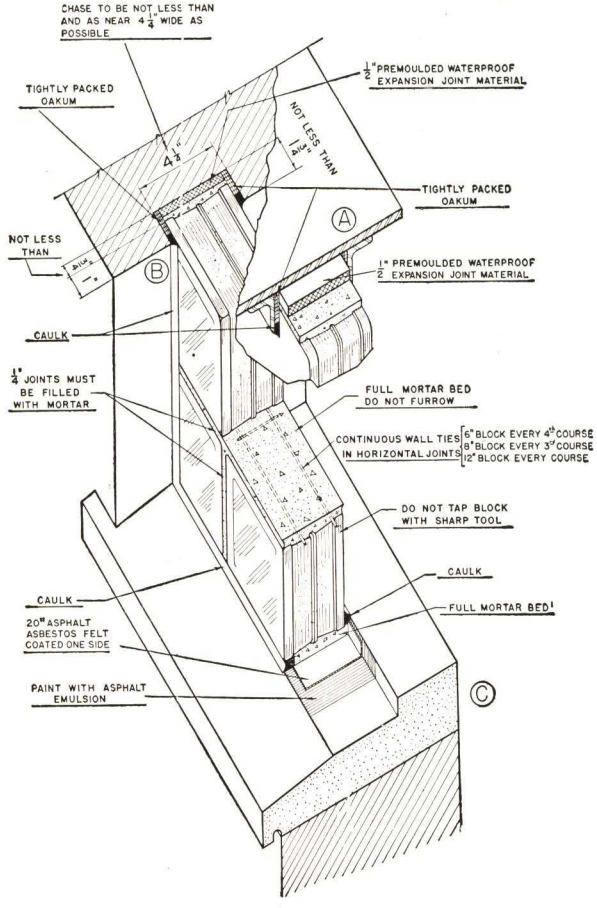
PC hollow Glass Blocks, Argus pattern, nominally 5¾ by 5¾ in. face dimensions and 3⅞ in. thick; laid with ¼ in. horizontal and vertical mortar joints; a ¼ by 1¼ in. steel shearlock bar secured to the sill for full length and coated with asphaltum paint before laying the first row; mortar consisting of one part Portland cement, one part hydrated lime, and four parts No. 1 screened torpedo sand by volume; each horizontal joint except between the two top rows reinforced for full length with No. 9 and No. 12 B.W.G. galvanized wire mesh; the glass block panels extending 1¼ in. deep in lintels of the masonry openings, with glass or mineral wool in the remaining spaces in the grooves to provide for expansion of the glass panels; exterior jamb and lintel edges caulked with waterproofing mastic.

Marking: "PC" molded on the inner surfaces of the blocks.

TYPICAL DETAILS SHOWING USE OF FIBROUS JOINT MATERIAL



TYPICAL DETAILS SHOWING USE OF PREMOULDED EXPANSION JOINT MATERIAL



4/39 HOW TO INSTALL

IMPORTANT BASIC FACTS:

1. PC Glass Block panels are non-load-bearing.
2. Adequate provision must be made for expansion at side jambs and head.
3. Sills must be painted with a heavy coat of asphalt emulsion or asphalt paint before placing felt strip and laying first mortar bed.
4. PC Glass Block panels should not exceed 144 sq. ft. in area or 20 lineal feet in any one dimension without provision for intermediate support and expansion joints.

MORTAR MIX

Use one (1) part Portland cement, one (1) part lime, and four (4) to six (6) parts sand measured by dry volume. Mix mortar drier than for clay brick work. The mortar must be well mixed with only enough water to produce a workable or fatty mix. Consistency should be as stiff as will permit good working, because glass blocks are non-absorbent. Approximately ten gallons of water per bag of cement has been found to give best results under average conditions.

Mortar should be mixed in quantities not larger than can be used in thirty minutes. Re-tempered or re-mixed mortar should not be used. Mortar that has been placed but not covered with blocks for more than thirty minutes must be removed and replaced. Setting accelerators should not be used, and freezing must be prevented without the use of anti-freeze compounds.

WHY IT PAYS TO USE PREMOULDED FILLER MATERIALS

1. Sound and permanent type of construction.
2. Elimination of void spaces. This provides greater resistance to penetration of water and air and results in improved insulation.
3. Prevention of mortar-bridging space between the glass blocks and the adjacent construction.
4. Provision of a clean and quick method for preparing the openings to receive the glass blocks.
5. Lower cost of installation.
6. Ease of erection.
7. Availability in unit lengths of 3′ 0″.

ESTIMATING DATA—for 100 Sq. Ft. of Panel Area

Size of block	6″	8″	12″
Number of blocks	400	225	100
Volume of mortar joints	2.6 cu. ft.	2.0 cu. ft.	1.4 cu. ft.
Approximate weight in panel	1800 lbs.	1900 lbs.	2000 lbs.

WORKMANSHIP

For satisfactory appearance and performance careful workmanship is essential. We therefore recommend that the following steps be followed carefully.

1. Fill all joints completely with mortar. It is important that voids in mortar joints be prevented in order to avoid possible leakage due to this cause.
2. Mortar-joints beds must not be furrowed.

NOTE: Various adaptations of the principles shown may be used. These details cover the basic principles for the installation of PC Glass Blocks with fibrous and premoulded expansion joint materials. Subsequent pages show construction details as applied to specific problems.

Premoulded expansion joint materials are preferred, and therefore the details on the following pages show the use of this material. However, oakum or other approved type expansion-joint material may be used.

PC GLASS BLOCKS 4/39

3. Use quarter-inch joints. PC Glass Blocks are designed to be laid up in a square bond with ¼" visible mortar joints. So laid, the average spacing center to center of the joints will be 6-inch, 8-inch or 12-inch. The exclusive PC "keylock" mortar joint allows a full bed of mortar with this small visible joint.
4. Rake joints out to a depth necessary to expose the corners of the blocks as sharp, clean lines. Strike and tool joints slighty concave and to a smooth finish after initial set.
5. Do not tap the blocks with metal or sharp tool.
6. Clean excess mortar from the faces of the blocks before it has set.
7. Consult drawings shown for basic laying procedure.

PC Blocks may be laid up in separate lifts of a limited number of courses each, in order to avoid compaction. Where such interruptions in the work occur, the exposed horizontal and vertical edges of the blocks must not be covered with mortar until laying is resumed. It is desirable that exposed mortar joints be kept wet for at least twenty-four hours after placing. Wet burlap hung over the panels will provide for this.

HEADS AND JAMBS

Provision for relative movements of the panel and the adjacent construction shall be in the form of approved pre-moulded waterproof expansion-joint strips or waterproofed fibrous packings. A space at least ½" in depth shall be provided for expansion-joint materials. In the case of interior partitions it is permissible to use mastics, soft fibrous packings, or heavy roofing felt, in such places as around door bucks and window frames. At least ¼" space must be provided at partition heads to allow for possible deflection of ceilings, etc.

For most satisfactory results glass block panels should be built in openings which have been provided with chases of the proper width and depth. Where panels are installed with wall anchors, these shall be so designed and placed as not to interfere with the free motion of the panel in the wall opening.

SILLS

Sills shall be of approved "slip construction" permitting greatest possible freedom of relative movement between the panel and the supporting structure. In no case shall "full chase" or channel sills be used.

WALL TIES

In exterior panels wall ties shall be used in horizontal mortar joints as follows:

6"—every four courses.
8"—every three courses.
12"—every course.

Wall ties shall run continuously with ends lapped at least 6", and shall not be anchored to the surrounding construction. Wall ties shall be galvanized, and may be of the expanded metal type, perforated metal strips, or a double wire mesh formed of two parallel wires (.150" thick) with electrically welded cross wires at regular intervals.

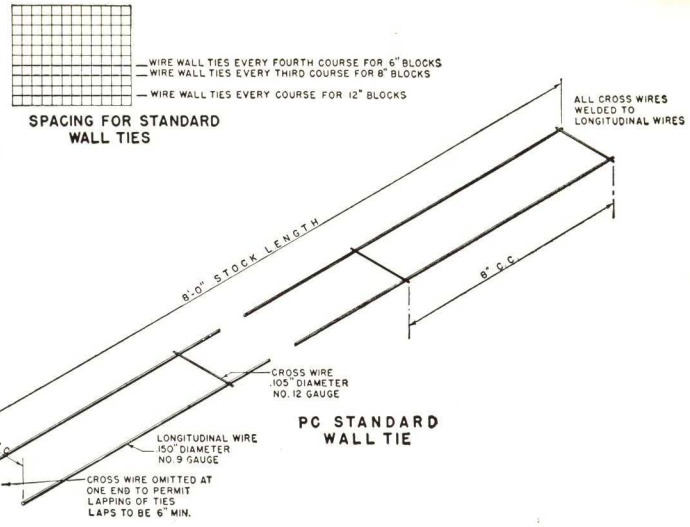
WALL ANCHORS

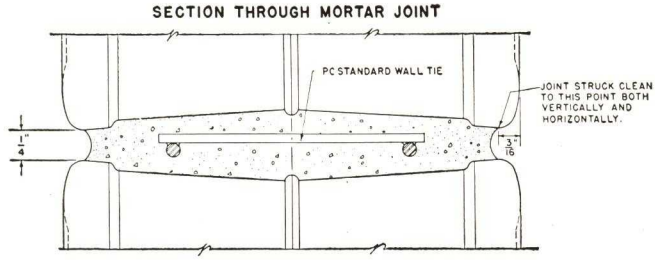
Wall anchors shall be No. 20 B.W.G. steel, zinc coated after fabrication according to A.S.T.M. Designation A93—27, class C; and must be crimped within expansion joint.

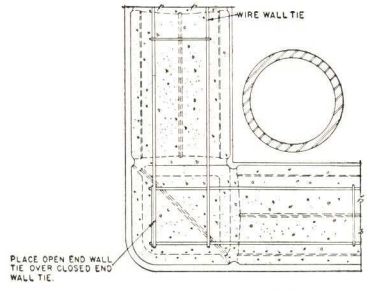
Wall ties and wall anchors should be used in horizontal mortar joints in accordance with recommendations shown at the right of this page.

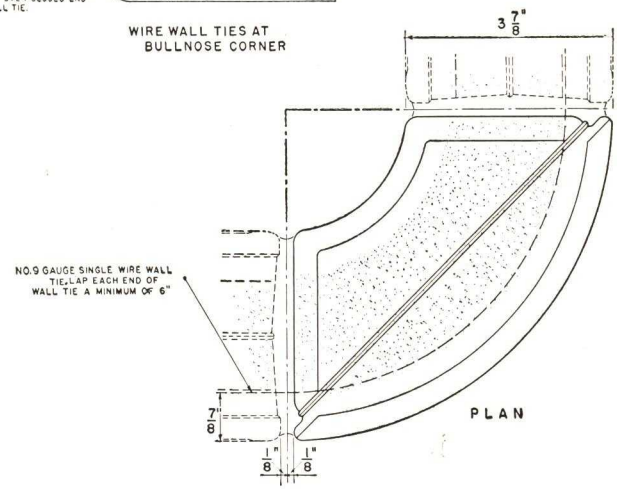
The following three pages of details show recommended construction to receive PC Glass Block panels. Various combinations of these sections will permit wide latitude in meeting most architectural problems.

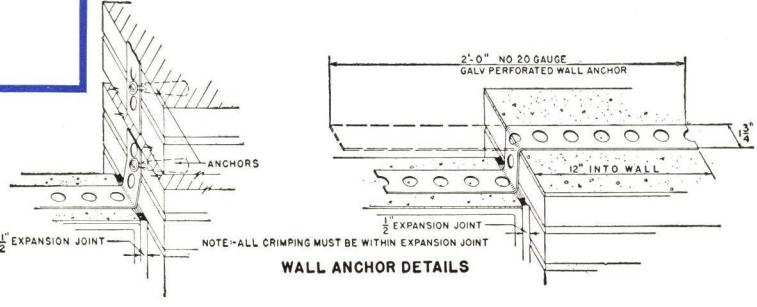
For other details regarding construction materials such as cement, lime and sand, see Specifications—page 15 of this section.





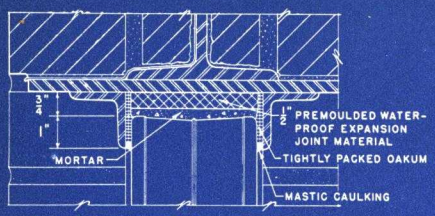




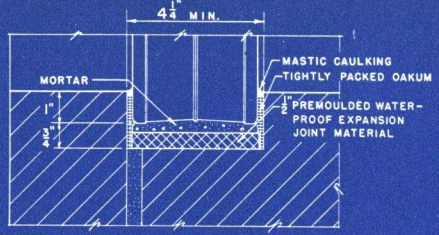


NOTE: Use No. 9 gauge (.150" diameter) galvanized single wire wall ties for corner blocks and curved panels. Place wall ties 7/8" in from outside face of blocks. Single wire wall ties shall be spaced in accordance with standard spacing of wall ties as shown on this sheet.

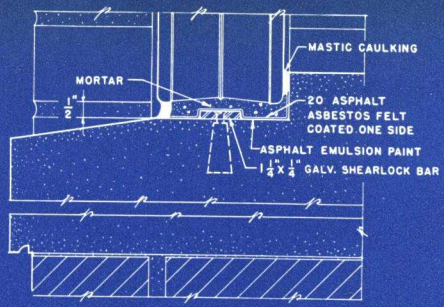
All wall anchors are to be located in same joints as wall ties wherever possible.



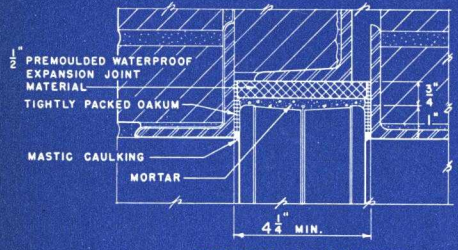
SECTION A-A



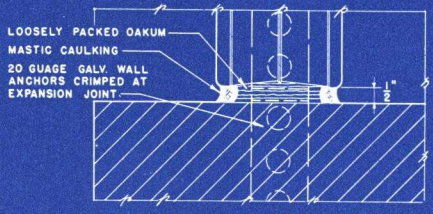
SECTION B-B



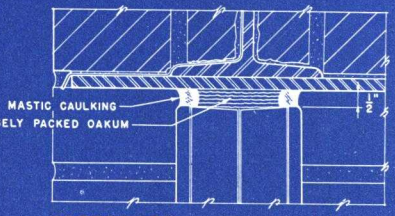
SECTION C-C



SECTION A-A SHOWING ALTERNATE CHASE CONSTRUCTION

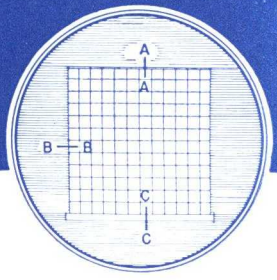


ALTERNATE SECTION B-B

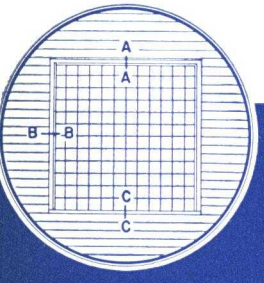


ALTERNATE SECTION A-A

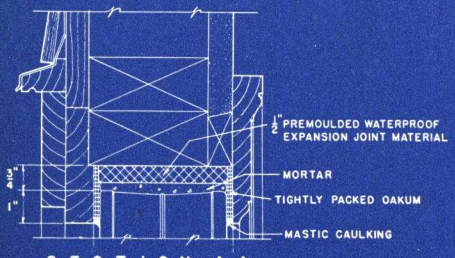
Details of PC GLASS BLOCK PANELS in MASONRY CONSTRUCTION



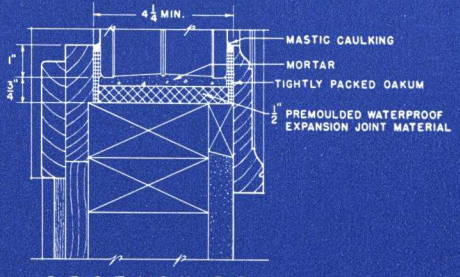
NOTES ON ALTERNATE SECTIONS A-A AND B-B—Where it is necessary to use wall anchors as the only lateral support for glass block panels, panels must not exceed 100 sq. ft. in area. The horizontal dimension of such panels must not be greater than 12 feet. Where wall anchors are used, provide sufficient number to insure adequate panel strength to resist wind loads, etc.



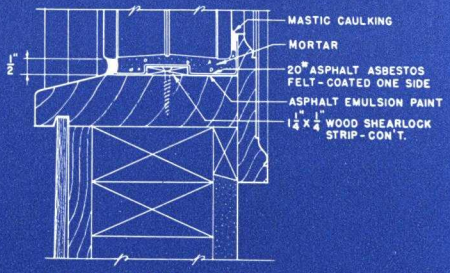
Details of PC GLASS BLOCK PANELS in FRAME CONSTRUCTION



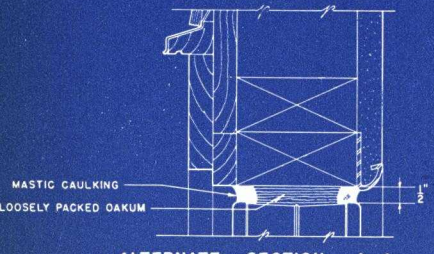
SECTION A-A



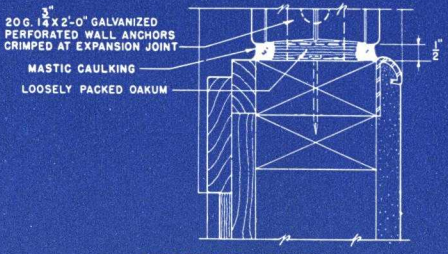
SECTION B-B



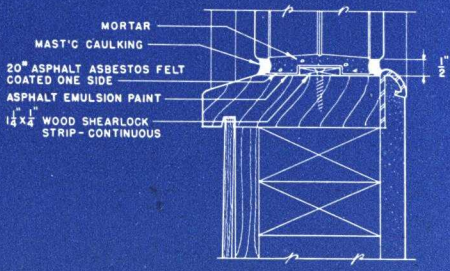
SECTION C-C



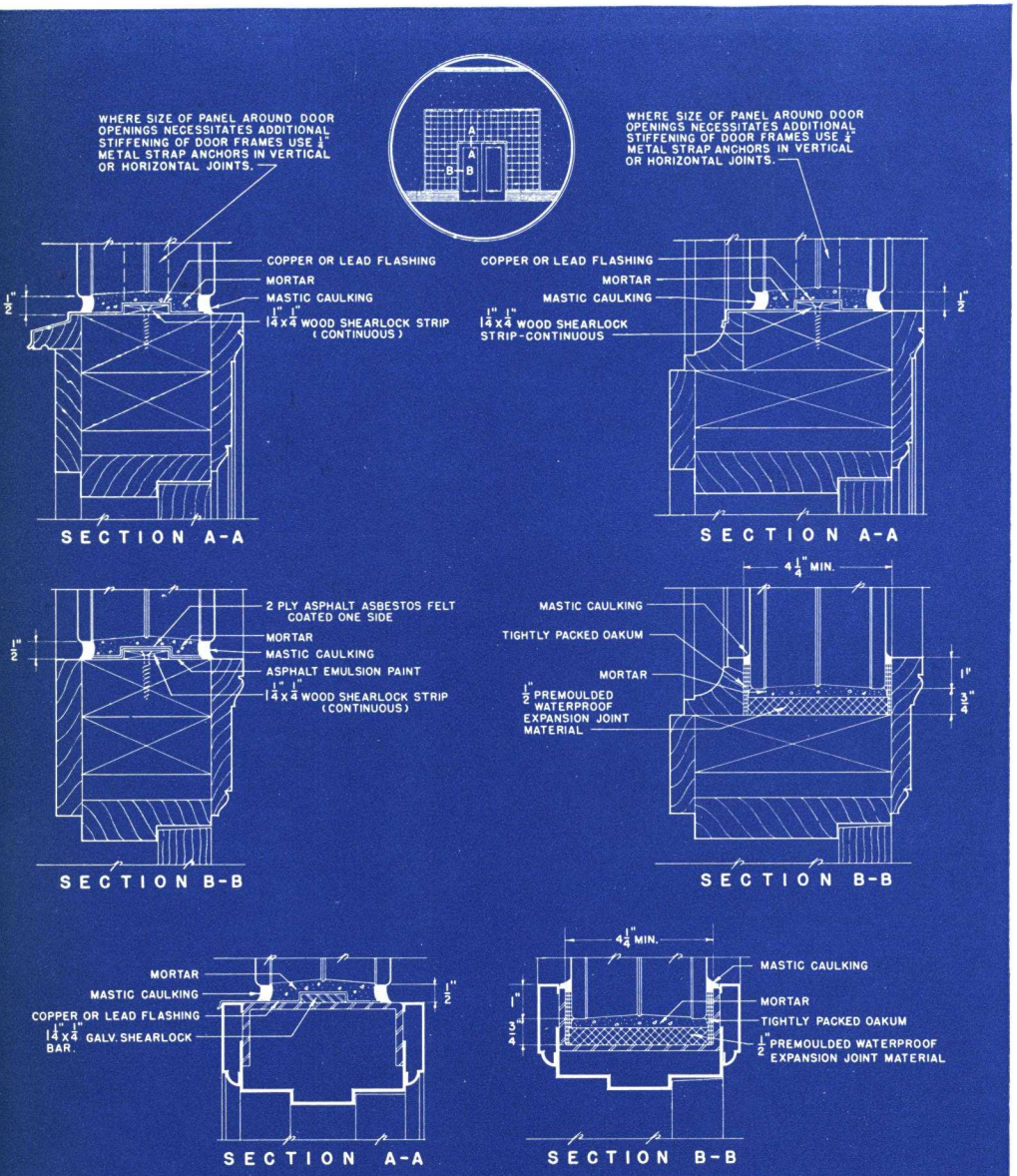
ALTERNATE SECTION A-A



ALTERNATE SECTION B-B

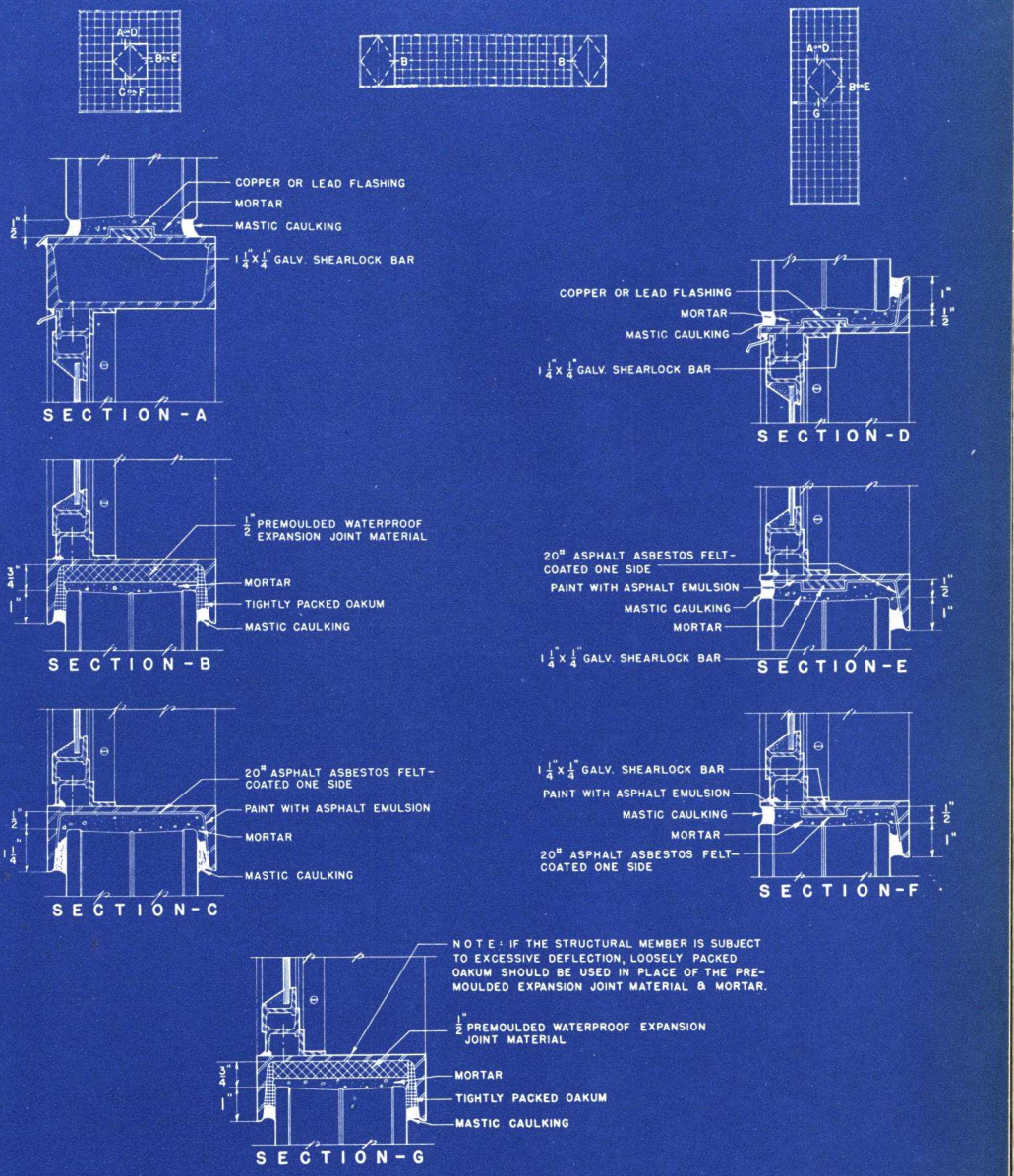


ALTERNATE SECTION C-C



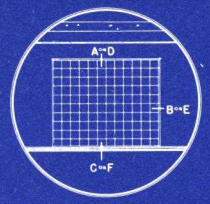
DETAIL SHOWING USE OF STANDARD TYPE METAL DOOR FRAMES

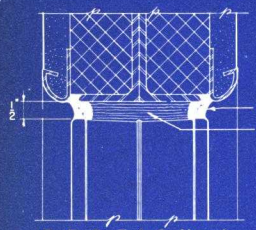
DETAILS OF WOOD AND METAL DOOR FRAMES IN PC GLASS BLOCK PANELS



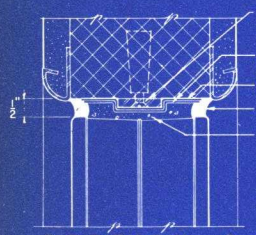
METAL WINDOW FRAMES IN PC GLASS BLOCK PANELS

PC GLASS BLOCK PANELS IN INTERIOR PARTITIONS

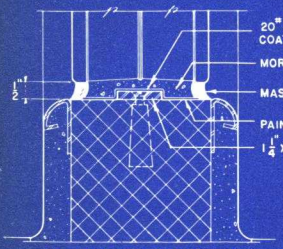




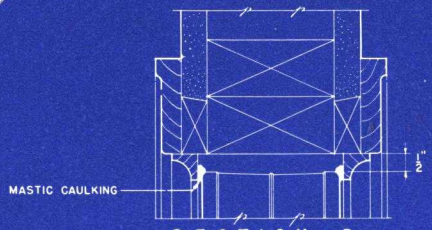
SECTION - A



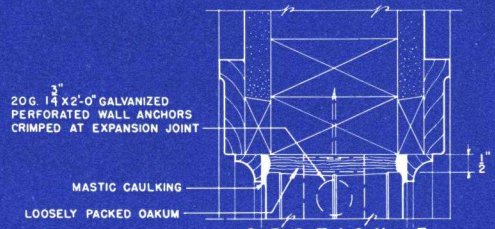
SECTION - B



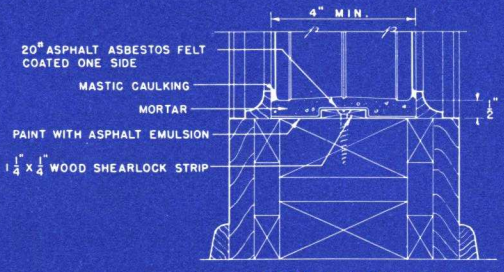
SECTION - C



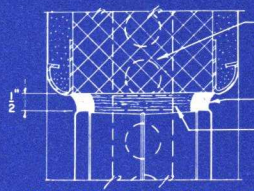
SECTION - D



SECTION - E



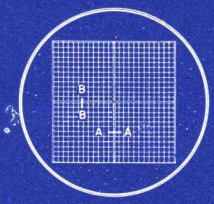
SECTION - F



ALTERNATE SECTION - B

Intermediate Supports and Expansion Joints For PC GLASS BLOCK PANELS

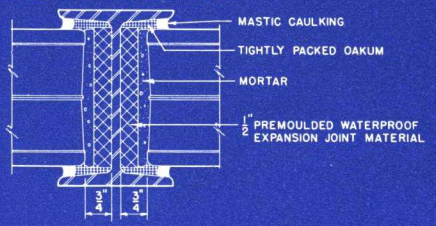
Details A-A and B-B show preferred construction of intermediate supports and expansion joints.



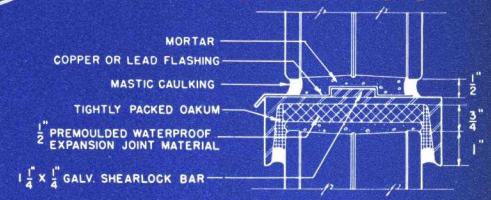
NOTE

If the structural member in Section B-B is subject to excessive deflection, loosely packed oakum should be used in place of premoulded waterproof expansion joint material and mortar.

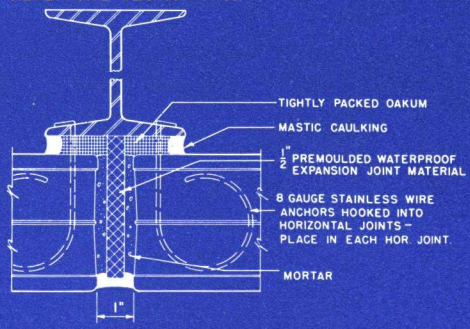
SECTION A-A



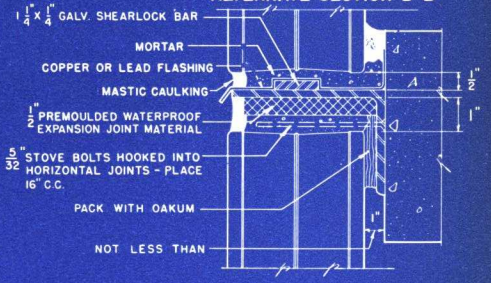
SECTION B-B



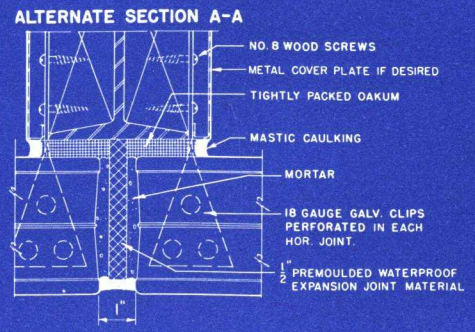
ALTERNATE SECTION A-A



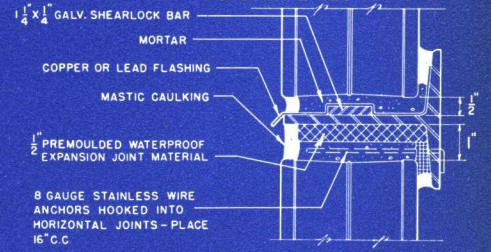
ALTERNATE SECTION B-B



ALTERNATE SECTION A-A



ALTERNATE SECTION B-B



SUGGESTED SPECIFICATIONS

GENERAL CONDITIONS:

The "General Conditions" of the contract are a part of these specifications.

SCOPE:

Furnish and install all glass blocks where shown on drawings or specified hereunder. This contract includes the furnishing and installing of all expansion-joint material, felts, shearlock bars, wall ties, wall anchors, caulking, necessary painting and any other material and labor necessary for a complete and satisfactory installation. This contract does not include the preparation of the structure to receive the glass block panels such as metal chases, etc.

MATERIAL:

Glass Blocks . . . Shall be hollow, partially evacuated, clear, colorless glass units as manufactured by the Pittsburgh Corning Corporation. Units shall be "all glass", formed of two halves fused together at a high temperature. Edges shall be so formed as to provide a "keylock" mortar joint. All blocks shall be coated on the edges with a grit-bearing water- and alkaline-resistant plastic material.

Patterns . . . Shall be as shown on drawings or as specified hereafter. (Indicate PC patterns and locations to be used.) All patterns shall be on inside faces of the blocks except where special patterns are specified and manufactured by the Pittsburgh Corning Corporation.

Types and Sizes . . . Shall be as shown on drawing or as specified hereunder: (Indicate types and sizes of standard and special blocks and locations to be used.)

Expansion Joint Material . . . Where shown or required shall be premoulded waterproof type, oakum, asphalt asbestos felts, or caulking compounds of type as specified or shown by the architect or as recommended by the Pittsburgh Corning Corporation.

Shearlock Bars . . . Where required shall be of size and type material as shown on drawings or as recommended by the Pittsburgh Corning Corporation.

Painting . . . All sills, and heads and jambs in frame construction shall be painted with a heavy coat of asphalt emulsion or asphalt paint.

Wall Ties . . . In exterior panels wall ties shall be used in horizontal mortar joints as follows:

6" block—every four courses.
8" block—every three courses.
12" block—every course.

Wall ties shall run continuously with ends lapped at least 6", and shall not be anchored to the surrounding structure. Wall ties shall be galvanized steel, double wire mesh formed of two parallel wires (.150" in diameter) with electrically welded cross wires (.105" in diameter) at regular intervals.

Wall Anchors . . . Wall Anchors may be used where recommended by the Pittsburgh Corning Corporation. Wall anchors shall be galvanized 20 gauge perforated metal strips 24" long by 1¾" wide and must be crimped within expansion joint.

Mortar . . . Shall be one part Portland cement, one part Lime and from four to six parts sand measured by dry rodded volume, mixed to a consistency as stiff as will permit good working, and shall be drier than for ordinary clay brick work.

Cement . . . Shall be a standard brand conforming with the specifications of the American Society for Testing Materials, A.S.T.M. Designation C9-30.

Lime . . . Shall be of an approved brand high calcium, well slaked quicklime, hydrated lime or Mason's Hydrate, conforming respectively with A.S.T.M. specifications C5-26 and C6-31.

Sand . . . Shall be free from silt, clay and loam in excess of 3% by weight as determined by decantation. Not more than 5% by weight shall pass a No. 100 mesh sieve and 100% shall pass thru a No. 8 mesh sieve.

LAYING:

All joints must be completely filled with mortar. Mortar must not bridge across the expansion joints. Bed joints shall not be furrowed. Blocks shall be laid up plumb, true to line with courses level and with not less than ¼" visible mortar joints. While mortar is still plastic and before final set, the joints shall be raked out to a depth necessary to expose the corners of the blocks as sharp, clean lines, and the joints immediately tooled slightly concave and smooth.

CAULKING:

Provide recess at all edges of glass block panels, both inside and outside, and caulk same with an approved mastic caulking compound.

FLASHINGS:

Unless otherwise specified, furnish and install all flashings where shown or required.

CLEANING:

While mortar is still plastic and before final set, clean off all mortar and other foreign material from the glass block surfaces. Final cleaning shall be done by others, but must not be started until mortar has reached its final set, to prevent distortion of the panels.

PITTSBURGH CORNING GLASS BLOCKS

MANUFACTURED BY

PITTSBURGH CORNING CORPORATION

GRANT BUILDING PITTSBURGH, PA.

DISTRIBUTED THROUGH THE FOLLOWING WAREHOUSES OF

PITTSBURGH PLATE GLASS COMPANY

AKRON, Ohio
674 Carroll St.
ALBANY, N. Y.
47 N. Ferry St.
ALLENTOWN, Pa.
827 N. 12th St.
AMARILLO, Texas
720 E. 13th St.
ATLANTA, Ga.
172 Marietta St., N. W.
BALTIMORE, Md.
8 S. Paca St.
BIRMINGHAM, Ala.
912 N. 20th St.
BOSTON, Mass.
300 Babcock St.
BRONX, N. Y.
441 Exterior St.
BROOKLYN, N. Y.
Jay, Water & Plymouth Sts.
BUFFALO, N. Y.
101 Seneca St.
BUTTE, Mont.
840 Utah Ave.
CHARLOTTE, N. C.
201 E. Sixth St.
CHICAGO, Ill.
451 St. Clair St.
CINCINNATI, Ohio
Broadway, Court &
Eggleston Aves.
CLEVELAND, Ohio
3849 Hamilton Ave.
COLUMBUS, Ohio
324 E. Second Ave.
DALLAS, Texas
Santa Fe Terminal Bldg.
DAVENPORT, Iowa
414 Scott St.
DENVER, Colo.
2519 Walnut St.
DES MOINES, Iowa
108 E. Fourth St.
DETROIT, Mich.
6045 Hamilton Ave.
EL PASO, Texas
1106 E. Overland St.
FORT WORTH, Texas
1825 Main St.
GRAND RAPIDS, Mich.
21 Ionia Ave., S. W.
HARRISBURG, Pa.
611 S. 17th St.
HARTFORD, Conn.
40 Chapel St.
HIGH POINT, N. C.
1 S. Hamilton St.
HOUSTON, Texas
101 Crawford St.
INDIANAPOLIS, Ind.
59 S. State Ave.
JACKSONVILLE, Fla.
601 N. Myrtle Ave.
KANSAS CITY, Mo.
125 W. Fifth St.
KNOXVILLE, Tenn.
207 Humes St.
LITTLE ROCK, Ark.
112 N. Scott St.
LOUISVILLE, Ky.
1601 W. Main St.
MEMPHIS, Tenn.
435 Madison Ave.
MIAMI, Fla.
1200 Biscayne Blvd.
MILWAUKEE, Wis.
820 N. Market St.
MINEOLA, N. Y.
49 Windsor Ave.
MINNEAPOLIS, Minn.
616 South Third St.
MT. VERNON, N. Y.
556 S. Fulton Ave.
NASHVILLE, Tenn.
1102 Grundy St.
NEWARK, N. J.
290 Elizabeth Ave.
NEW HAVEN, Conn.
26 Mills St.
NEW ORLEANS, La.
1500 Poydras St.
OKLAHOMA CITY, Okla.
101 E. California Ave.
OMAHA, Neb.
1402 Jones St.
PEORIA, Ill.
915 S. Washington St.
PHILADELPHIA, Pa.
30-40 N. 16th St.
PITTSBURGH, Pa.
632 Duquesne Way
PROVIDENCE, R. I.
333 Harris Ave.
RICHMOND, Va.
302 Seventh St., S.
ROANOKE, Va.
14 Pleasant Ave., S. E.
ROCHESTER, N. Y.
362 Exchange St.
ROCKFORD, Ill.
123 South Third St.
SAGINAW, Mich.
103 Fitzhugh St.
ST. LOUIS, Mo.
3900 Chouteau Ave.
ST. PAUL, Minn.
459 Jackson St.
SAN ANTONIO, Texas
1420 S. Alamo St.
SAVANNAH, Ga.
Central of Georgia Terminals
SCRANTON, Pa.
823 Wyoming Ave.
SHREVEPORT, La.
90 Fannin St.
SOUTH BEND, Ind.
1138 S. Lafayette St.
SPRINGFIELD, Mass.
40 Albany St.
SYRACUSE, N. Y.
838 Erie Blvd., W.
TAMPA, Fla.
102 Madison St.
TOLEDO, Ohio
2410 Albion St.
TULSA, Okla.
301 E. Archer St.
UTICA, N. Y.
615 Eagle St.
WASHINGTON, D. C.
4th & Channing Sts., N. E.
WILKES-BARRE, Pa.
54 Scott St.
YOUNGSTOWN, Ohio
25 N. Watt St.

AND ON THE WEST COAST THROUGH W. P. FULLER & CO.

PHOENIX, Ariz.
TUCSON, Ariz.
SALT LAKE CITY, Utah
OAKLAND, Calif.
SEATTLE, Wash.
TACOMA, Wash.
SPOKANE, Wash.
SACRAMENTO, Calif.
WALLA WALLA, Wash.
MISSOULA, Mont.
BUTTE, Mont.
PORTLAND, Ore.
FRESNO, Calif.
YAKIMA, Wash.
LOS ANGELES, Calif.
SANTA BARBARA, Calif.
SAN DIEGO, Calif.
SAN FRANCISCO, Calif.

A. DURR & COMPANY

Metal Clad Coping, Window Heads and Sills; Roof Ventilators

1937 Walnut Street, CHICAGO, ILL.

Products

Durr Metal Clad Coping, Window Heads and Sills. Also manufacturers of Durr Stationary Roof Ventilators.

Durr Metal Clad Coping Window Heads and Sills (Patented)

Durr Metal Clad Coping provides a permanent, ornamental and thoroughly protective covering for any type of masonry parapet. Use of this coping eliminates any need for through-wall flashing or any other type of waterproofing.

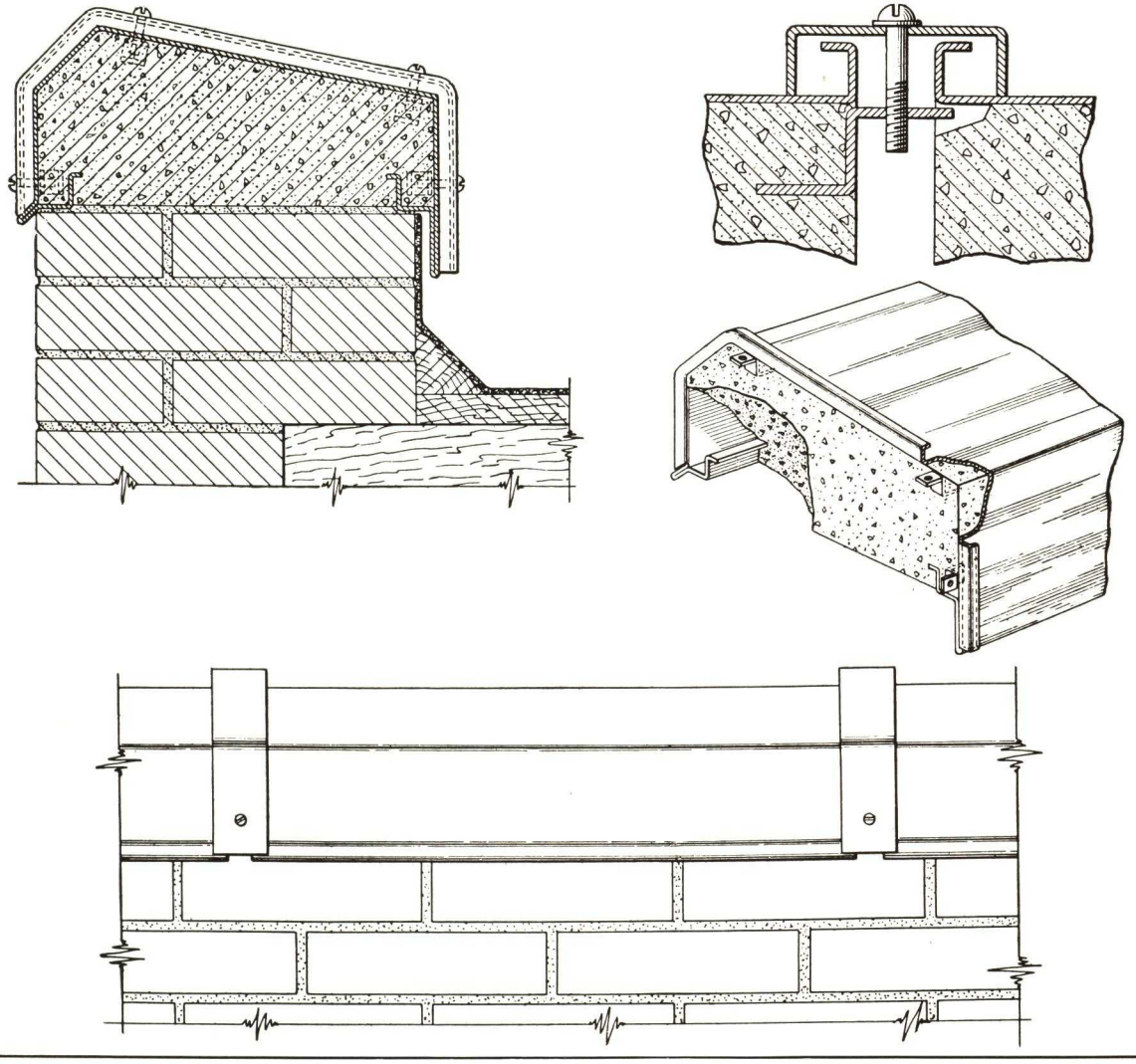
The coping consists of a metal covering with a concrete or ceramic fill. The metal covering and the fill are erected as a unit, set in a mortar bed similar to stone or tile coping, except that the end joints are mechanical, no mortar being used. The units can be furnished in any length up to 4 feet.

The end joint construction provides for expansion and contraction of the metal and prevents any seepage of water down through the walls. The end joints are made water tight by means of an edge turned up on each edge of the coping and running continuously around the top and two sides. This edge is copped by a U-shaped member held in place by machine screws.

The coping may be formed with projecting drips on either side or with a pocket on the roof side to provide a counter flashing receiver for the roofing.

The style of the coping and the material may be varied to conform to any architectural or structural requirements.

The Durr patented form of coping construction can also be applied to belt courses, window heads, sills or any other protective ornamentation which is usually made of stone, terra cotta, or tile.



DETAILS DURR METAL CLAD COPING CONSTRUCTION

THE ROBINSON CLAY PRODUCT COMPANY

GENERAL OFFICES
Second National Building, AKRON, OHIO

SALES OFFICES AND WAREHOUSES

ALBANY, N. Y., 1357 Broadway
BALTIMORE, MD., 1620 Baltimore Trust Bldg.
BLOOMFIELD, N. J., 20 Orange St.
BOSTON, MASS., 135 No. Beacon St.
BUFFALO, N. Y., 1146 Seneca St.
CHICAGO, ILL., 111 W. Washington St.
EAST HARTFORD, CONN., 170 Tolland St.
INDIANAPOLIS, IND., 1013 East 21st St.
MASPETH (L. I.), N. Y., 56-24 Flushing Ave.
MOUNT VERNON, N. Y., 160 MacQuesten Parkway, No.
NEW YORK, N. Y., Empire State Bldg.
PHILADELPHIA, PA., Cambria St. at 19th
ROCHESTER, N. Y., 600 Buffalo Road
SYRACUSE, N. Y., Sand and Spencer Sts.
TORONTO, ONTARIO, CANADA, Shaftesbury Ave.

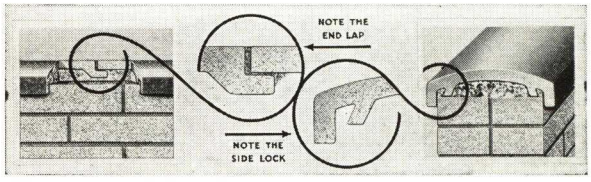
Products

Fire Brick
High Temperature Cements
Insulating Brick
Vitrified Clay Sewer Pipe
Acidware Pipe
Meter Boxes
Septic Tanks
Skip Pipe Underdrains
Channel Pipe
Liner Plates
Segment Block
Lap-Lok Wall Coping
Chimney Pots and Tops
Fireclay Stove Pipe
Flue Lining
Asphaltic Compound
Drain Tile
Jute (Caulking Yarn)

Robinson Lap-Lok Wall Coping

Here is the modern, streamlined coping for brick, concrete, or stucco parapet walls—a coping entirely different in both appearance and design.

Robinson Lap-Lok Wall Coping is made with an ingenious patented construction, as shown in the illustration below. The end lap makes a flush, water- and frost-tight joint, protected by the sealed lap. The side lock bonds the coping so securely that it becomes an integral part of the wall. These features of construction of Lap-Lok have the following definite advantages not found in other copings:



New-Style Patented Lap-Lok Coping

Enlarged views show the exclusive end lap and side lock construction. This simple design gives Lap-Lok many advantages over conventional copings

1. Gives the wall a smooth, unbroken appearance, eliminating the unsightly raised joints of ordinary coping.

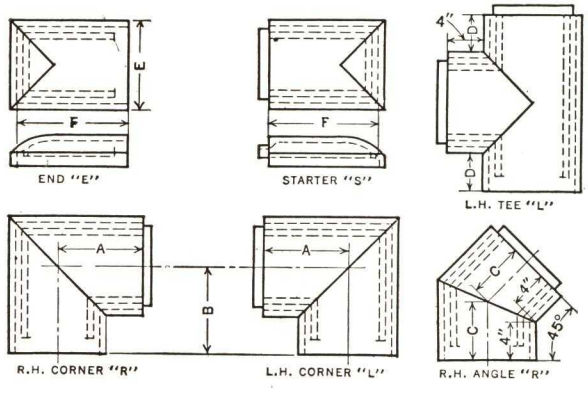
2. Prevents disintegration of joint or wall by water, weather, frost or fumes.

3. Coping is bonded permanently to the wall. Prevents falling of coping or bricks.

4. Makes installation easier and faster.

Robinson Lap-Lok Wall Coping is made of imperishable, thoroughly vitrified clay, protected by a permanent salt glaze, and is available in either buff or glazed reddish brown colors.

This coping is equally suitable for covering the parapet walls of residences, apartments, or business buildings. Although it has been on the market for only a few years, Lap-Lok has already been used on hundreds of installations, including many of the recent Public Housing Projects.

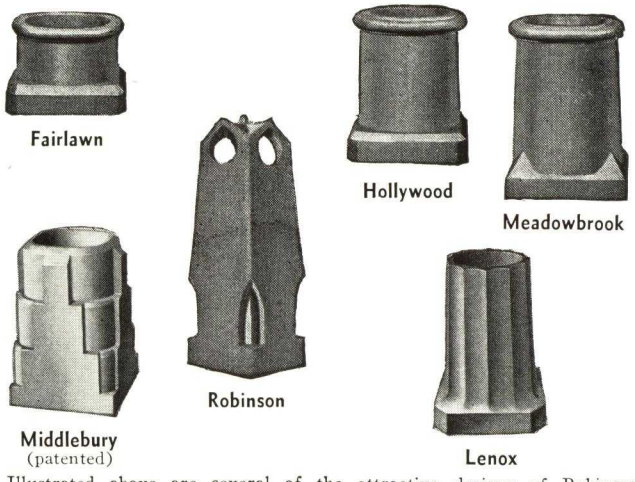


SIZES AND DIMENSIONS OF LAP-LOK WALL COPING

Width (inches)	Straight coping lengths (inches)	A	B	C	D	E	F
9	6-12-24	9	9	6¼	6¾	10¾	12
13	6-12-24	11	11	7	4⅞	14⅞	12
18	6-12-24	14	14	8¼	2	20	18

Robinson Chimney Pots and Tops

Robinson Chimney Pots add an attractive finished appearance to modern residences by providing a roof



Illustrated above are several of the attractive designs of Robinson Chimney Pots and Tops. These designs are available in different sizes, as shown in the specifications below

SPECIFICATIONS OF ROBINSON CHIMNEY POTS

Style	Opening inside (inches)	Base outside (inches)	Height (inches)	Flue outside (inches)	Approx. weight (lbs.)
H—Meadowbrook 813	7½x12	12½x17	24	8½x13	90
H—Meadowbrook 1313	12 (dia.)	17 x17	24	13 x13	110
J—Fairlawn 813	7½x12	12½x17	12	8½x13	50
J—Fairlawn 1313 ...	12 (dia.)	17 x17	12	13 x13	55
K—Hollywood 813 ...	7½x12	12½x17	20	8½x13	70
K—Hollywood 1313 ..	12 (dia.)	17 x17	20	13 x13	82
L—Lenox 1313	10¼ (dia.)	15¾x15¾	24	13 x13	100
M—Middlebury 1313 .	10½ (dia.)	16 x16	24	13 x13	143
R—Robinson 88	7¼x 7¼	13 x13	37	8½x 8½	155
R—Robinson 813	7 x11½	13 x18	38	8½x13	220
R—Robinson 1313 ...	11½x11½	18 x18	37	13 x13	285

line in harmony with the rest of the house. They are now available in a variety of new and attractive styles to conform with any type of architectural treatment, and represent a vast improvement over the ordinary, obsolete styles of chimney pots.

Robinson Chimney Pots are manufactured from selected clays, burned to withstand excessive heat, and, as a result, they will not crack from sudden changes in temperature. They have a smooth unglazed finish, and are available in two colors—reddish brown and terra cotta. They fit over standard size flue linings and effectively add to the draft of the chimney.

Robinson Fire Clay Flue Linings

Robinson Flue Liners are the best protection against fires caused by leaky and sooty chimneys. Their smooth surface will not collect soot, and their use requires only one-tenth the number of joints compared with brickwork. In addition, they improve the draft of the chimney, save fuel, and protect the mortar joints of the brickwork against the destructive action of gases.

Robinson Fire Clay Flue Linings are smoothly finished, buff in color, and are made of thoroughly burned fire clay, a material unaffected by heat, gases, and sudden changes in temperature. They are made in both round and rectangular shapes.

Square or Rectangular Flue Lining

Round Flue Lining

RECTANGULAR FIRE CLAY FLUE LINING

Outside dimensions (inches)	Approx. weight per foot (lbs.)	Length (feet)	Thickness (inches)
4½ x 8½	11	2	5/8
4½ x13	18	2	5/8
4½ x18	27	2	5/8
7½ x 7½	14	2	5/8
8½ x 8½	18	2	5/8
8½ x13	27	2	3/4
8½ x18	36	2	7/8
13 x13	35	2	7/8
13 x18	45	2	7/8
18 x18	70	2	1 1/8
20 x20	103	2	1 3/8
20 x24	115	2	1½
24 x24	129	2	1½

ROUND FIRE CLAY FLUE LINING

Inside diameter (inches)	Approx. weight per foot (lbs.)	Length (feet)	Thickness (inches)
6	11	2	5/8
7	16	2	11/16
8	17	2	3/4
10	27	2	7/8
12	37	2	1
15	52	2	1 1/8
18	67	2	1 1/4
20	90	2	1 3/8
22	110	2	1 5/8
24	120	2	1 5/8
27	186	2½, 3	2
30	218	2½, 3	2 1/8
33	315	2½, 3	2 1/4
36	330	2½, 3	2½

Robinson Septic Tanks

Robinson Septic Tanks offer an economical, efficient, sanitary sewage disposal system for residences, schools, factories, farms, etc., wherever running water is available. The septic tank system is much superior to the cesspool method of disposal from the standpoints of health, efficiency of operation, and over-all economy. It is self-operating, free from odors, requires no chemicals, is easy to install, and is completely underground.

Robinson Septic Tanks are made of thoroughly vitrified salt-glazed clay—the best material for sewer construction. They resist the actions of acids and gases from within and the attacks of alkaline ground water from the outside.

Robinson Septic Tank

An important feature of Robinson Septic Tanks is the patented burned-in baffle. In these tanks the baffle cannot become displaced, as so often happens with other tanks, and thus stop the successful operation of the system and cause considerable expense.

There are two sizes of Robinson Septic Tanks available—one for standard systems, and a larger size for super systems.

SPECIFICATIONS OF ROBINSON SEPTIC TANKS

	Over-all size of tanks (inches)	Weight (pounds)		Capacity (persons)	
		Top section	Bottom section	Two tanks	Three tanks
Standard Units	24x48	260	290	7 to 14	10 to 20
Super Units	30x72	690	720	16 to 30	25 to 50

Robinson Skip Pipe Underdrain

Robinson Skip Pipe is an entirely new development—an all-purpose drainage pipe which reduces costs and improves drainage under all conditions. It can be used successfully for extra-rapid drainage on all types of jobs from small residences to large airports.

Skip Pipe is a semi-circular type of bell and spigot pipe with a superimposed cradle. It possesses unusual

Robinson Skip Pipe Underdrain—the New All-purpose Drainage Pipe

mechanical strength, due to its design and to the fact that it is made from de-aired clay and is thoroughly vitrified.

This pipe is available in sizes from 4 to 12 in. in diameter in 2-ft. lengths. The two largest sizes are also available in 3-ft. lengths.

Here are some suggested uses for Robinson Skip Pipe Underdrains:

(1) Residences
(2) Outside foundations
(3) Combination surface and underdrain for airports
(4) Highways
(5) Railroad right-of-way and track
(6) Athletic and recreational fields
(7) Sewage disposal plant filter underdrains

Consult Your Local Robinson Dealer

Robinson clay building products are available through progressive dealers. Consult your local Robinson dealer for complete information and prices. His experience and the experience of the Robinson Clay Product Company will be at your disposal in the selection and installation of the proper clay products for building construction.

NATIONAL FIREPROOFING CORPORATION

1889—50 Years—1939

Manufacturers of Natco Structural Clay Tile

GENERAL OFFICES
PITTSBURGH, PA.

BRANCH OFFICES

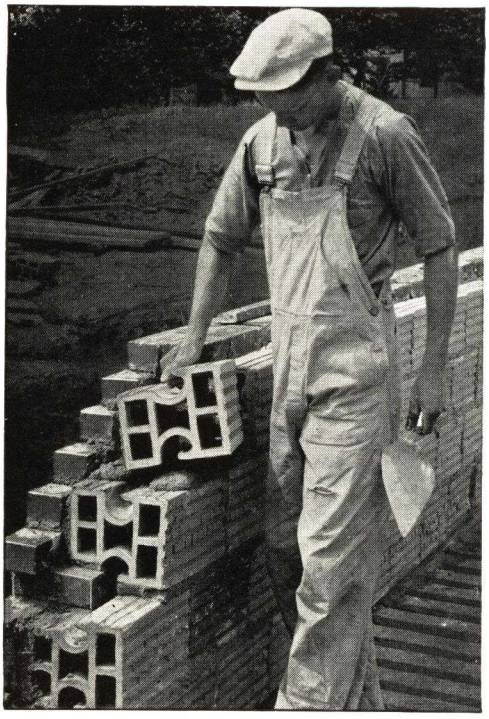
NEW YORK, 205-17 E. 42nd Street
PHILADELPHIA, Architects Building
CHICAGO, 208 W. Washington Street
DETROIT, 5737 Commonwealth Avenue
NORTH BIRMINGHAM, ALA.

IN CANADA: The National Fireproofing Company of Canada, Ltd., TORONTO, ONT.

The Natco Line of Structural Clay Products comprises units which can be economically and effectively used for walls, partitions and foundations, for fireproof floors of many kinds, as a protection for steel structural members, for roofs—in short, they have an application somewhere in every building, everywhere in some buildings.

TRADE MARK
NATCO
SINCE 1889

The Engineering Department of the Corporation will gladly co-operate in working out the most efficient and economical use of Natco Structural Clay Tile on specific applications.



Speed-A-Backer Wall section showing how handle increases speed of erection. Note how brick is bonded, also absence of through mortar joints

Natco Speed-A-Backer Tile

For Backing Brick Walls

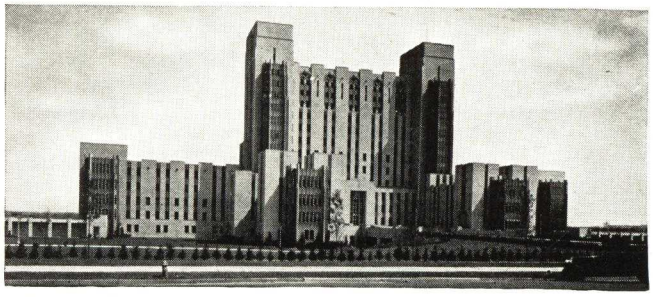
Licensed under Wheeler Patent No. 1803158 and Patent No. 1456373.

Natco Speed-A-Backer Tile—a structural clay tile unit—hard burned—designed with two smooth handles—one at top—the other at the bottom of each tile. Speed-A-Backers are laid very speedily with one hand and without gloves. The mason retains the trowel in the other hand at all times. This greater ease and speed of handling —with lessened costs for mortar—naturally means reduced construction costs in laying time over ordinary backing materials.

Non-continuous mortar joints, together with the three-cell or air pocket protection at every point in the thickness of the wall, prevent dampness from being carried through the mortar joints by capillary attraction—also resist the passage of heat and cold. Being made of hard burned clay, shrinkage, which causes cracks in the plaster, is reduced to a minimum.

Natco Speed-A-Backer construction permits a perfect bonding of brick with the tile wall every sixth course. With this construction, loadbearing value in the complete wall is at a maximum.

Jane Addams Housing Project, Chicago, where Natco Speed-A-Backer Tile was used for exterior walls. S. N. Nielsen Co., Maurice L. Bein and Dahl-Stedman, contractors



United States Naval Hospital, Philadelphia. Karcher & Smith, Architects, John McShain, Inc., General Contractor, John B. Kelly, Inc., Mason Contractor. Natco Speed-A-Backer Tile used throughout

Natco Speed-A-Backer Tile—the Fastest Laid Backing Tile in the World

Below are standard sizes of Natco Speed-A-Backer Tile:

Tile Thickness, inches	Tile Plus Brick, inches	Tile Height, inches	Tile Length, inches
5⅞	10	7¾	12
7¾	12	7¾	12
9¾	14	7¾	12
11¾	16	7¾	12

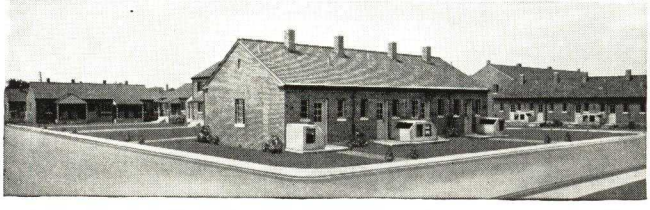
Also furnished in 7⅜-inch height.

One Speed-A-Backer unit with ½-inch mortar joints lays up .716 square foot of wall area. When estimating, figure 140 Speed-A-Backer units for 100 square feet of wall area. Where ⅜-inch brick joints are specified, Speed-A-Backer Tile in the 7⅜-inch height is furnished. Here, each tile lays .684 square foot of wall area. Figure 146 units for 100 square feet of wall area.

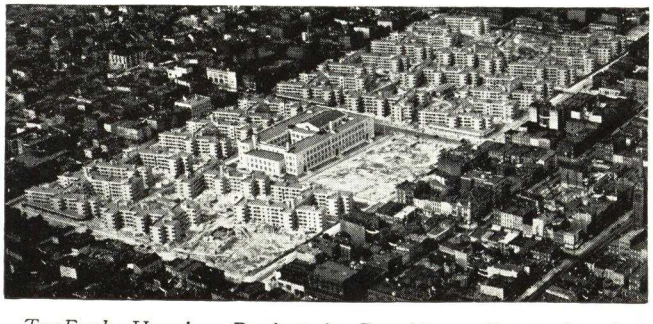
The all-tile interior surface of a Speed-A-Backer wall is scored for plastering, but for unplastered smooth walls, tile with smooth interior face is furnished on special order.

With Natco Speed-A-Backer Tile, but one unit is required on the scaffold. Its weight, compared with solid brick masonry, materially reduces foundation and steel costs, without sacrifice of strength and permanence. Natco Speed-A-Backer wall construction is particularly economical of mortar. It saves approximately one-third over ordinary tile construction. The cellular tile structure promotes insulation comfort and economy.

Natco Speed-A-Backer Tile construction combines strength and lightness with speed and labor economies, which make it very desirable for use in all types of brick faced buildings of either loadbearing or skeleton curtain wall construction. It can also be used with units reversed to build complete tile walls. The wall detail, bottom left, illustrates this type of construction.



Smithfield Court Houses at Birmingham, Alabama. Both Natco Speed-A-Backer Tile and Natco Clay Tile were used in this project. D. O. Whildin, Architect

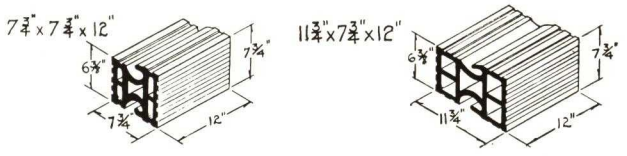


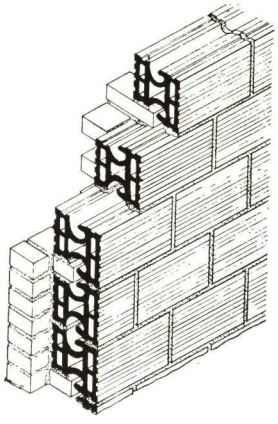
TenEyck Housing Project in Brooklyn. Natco Speed-A-Backer Tile, Natco Speedtile and Natco Structural Facing Tile were extensively used. Shreve, Lamb & Harmon, Architects

Greater Effectiveness with the Natco Universal Closure

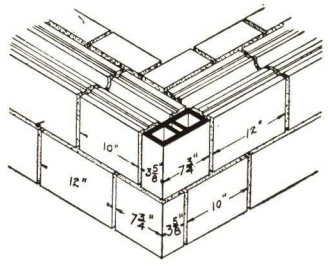
By the use of the new Natco Universal Closure Unit, 3⅝x7¾x7¾ inches—as shown in the detail drawings below for corners, jambs, pilasters, etc.—an even greater flexibility, speed and effectiveness can be secured in backing up brick walls completely with Speed-A-Backer Tile.

Details of Natco Speed-A-Backer Shapes and Wall Sections



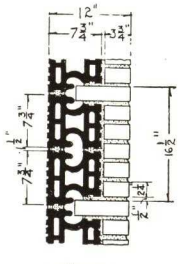


WALL DETAIL

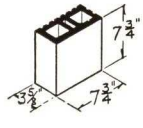


CORNER DETAIL - 12" WALL

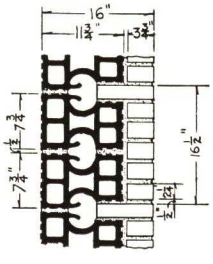
NOTE -
10" LENGTHS OF STRETCHERS USED ONLY FOR SMOOTH FACE WALLS
FOR WALLS SCORED FOR PLASTER USE ONLY 12" LENGTHS, FORMING 4" BREAK OF BOND



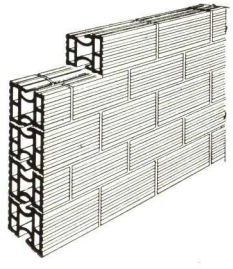
12" WALL



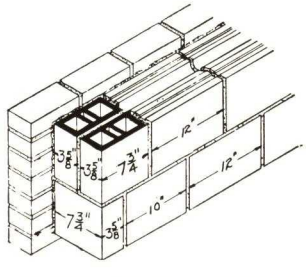
UNIVERSAL CLOSURE



16" WALL



WALL DETAIL



DETAIL AT JAMB - 12" WALL

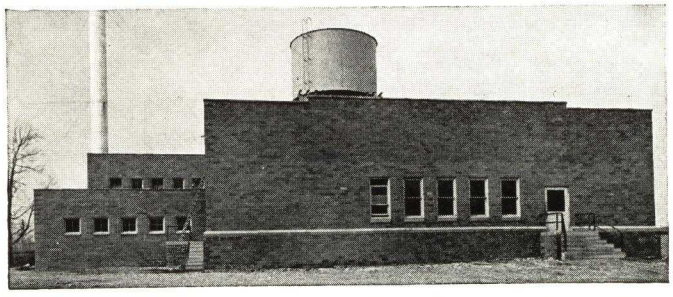
Natco Speedwall Tile

For Permanent, Attractive, Insulated, Fireproof, Termite-Proof, Damp-Proof Walls and Foundations

Illustrating ease and speed with which Natco Speedwall Tile is laid in the wall.

A new insulated structural wall and foundation unit of hard burned clay, furnished *glazed* in mingled buff shades, and *unglazed* in natural, burned clay colors with manganese spot. In both glazed and unglazed, the exterior surfaces have a pleasing wire-cut texture finish with a smooth sanitary interior.

Series No.	Thickness, inches	Length, inches	Height, inches
S-4816	3¾	16	8
S-8816	8	16	8
S-12816	12	16	8
S-8512	8	12	5



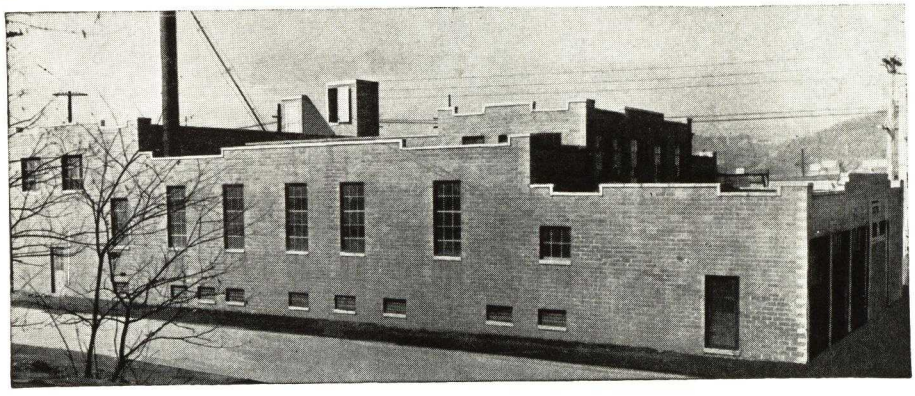
Windsor Dairy Company, Carrollton, Ohio, found that Natco Speedwall Tile was ideal from a sanitary and every other standpoint.

Smooth, built-in handles in the 8-inch and 12-inch wall thicknesses, licensed under Wheeler Patent No. 1803158, effect savings of from 15 per cent to 30 per cent in laying time.

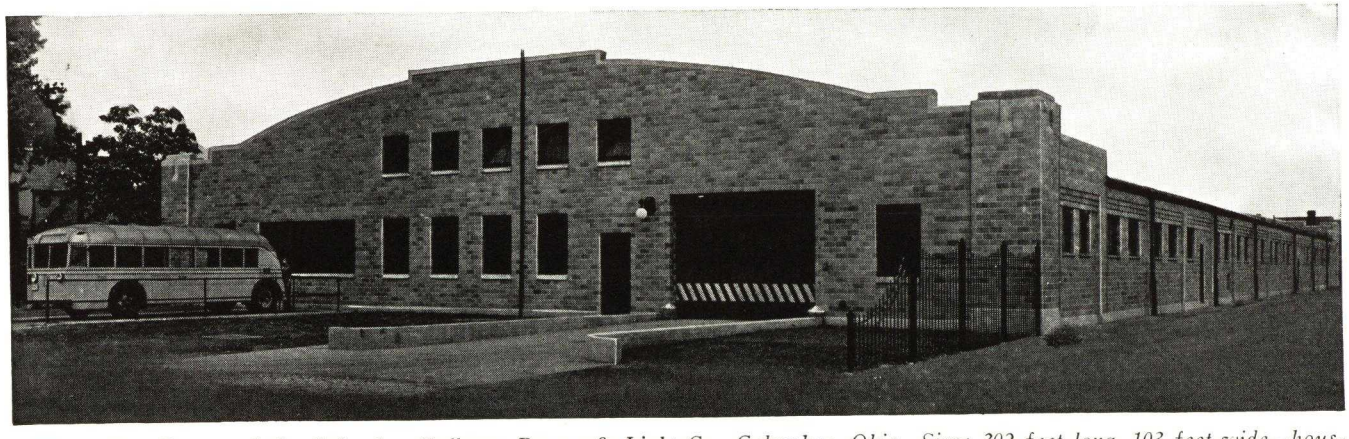
Non-continuous mortar joints resist the passage of moisture through the walls. The double-shell design, minimum of through cross-webs, and the location of dead air spaces within the tile add to the insulation value.

In addition to savings in future painting and repairs, there is also freedom from subsequent shrinkage and cracking of walls when Speedwall tile is used.

Natco Speedwall Tile insures fireproof, dry, sanitary, termite-proof, attractive basements. It is also ideally suited for walls of residences, public and private garages, farm buildings, mill, mine, railroad, warehouse, dairy, brewery, distillery and similar types of commercial and industrial buildings, where sanitation, insulation, attractiveness, low maintenance costs and durability are important.

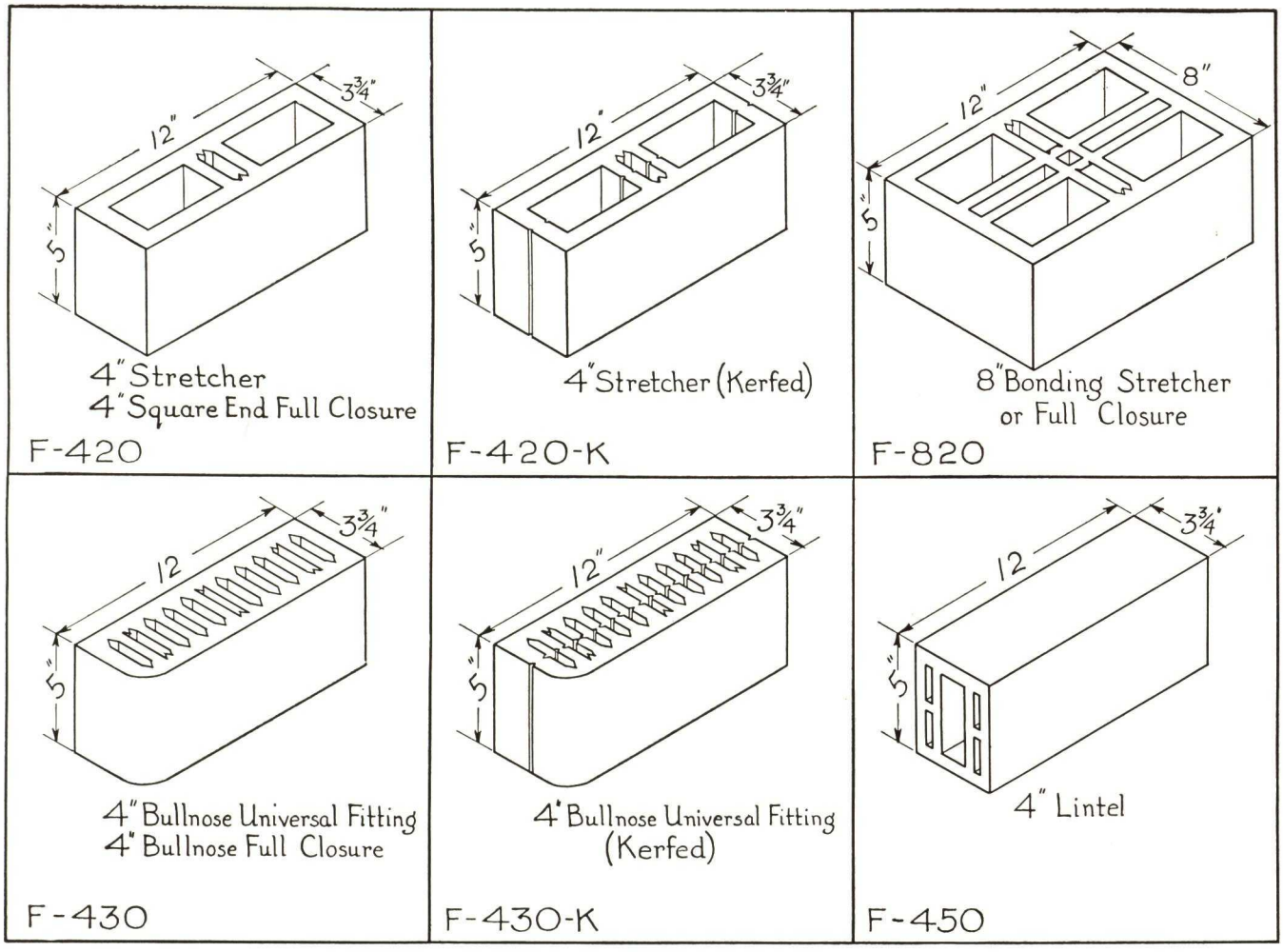


Showing Natco Speedwall Tile in the new modern plant of the Hays Packing Co., Hays, Pa. Harry M. Jacobson, Homestead, Pa., Contractor.



Motor Bus Garage of the Columbus Railway, Power & Light Co., Columbus, Ohio. Size: 302 feet long, 103 feet wide—housing 75 buses, Natco Glazed Speedwall Tile was used throughout.

Natco Unglazed VersaTile—for Low-Cost Interior and Exterior Masonry Walls



A new Natco line of smooth, structural facing tile, suitable for low-cost interior and exterior masonry walls.

Pleasing Range

Natco Unglazed Loadbearing VersaTile is furnished in a pleasing range of mingled buff and gray shades, combined with a manganese spot. All four sides are smooth. Being manufactured by the de-airing process, all surface defects and blisters are eliminated. At the same time maximum strength and density are secured.

Six Primary Shapes

Natco Unglazed VersaTile is furnished in six primary shapes, all with 5 x 12-inch face, for wall thicknesses of 3¾ and 8 inches. Furring shapes, 1⅞ inch thick are cut on the job from the 3¾-inch primary shapes.

From the six primary shapes, shown above, a larger number of other shapes can be readily cut on the job. The simplicity and flexibility of this new type of structural facing tile, made possible by the unique design of the primary shapes, makes Natco VersaTile the real economy line.

Below is a list of all the primary shapes:

4-inch Stretcher or square end Full Closure.....F-420
4-inch Stretcher—Kerfed F-420-K
8-inch Bonding Stretcher or Full Closure.....F-820
4-inch Bullnose Universal Fitting and Full Closure....F-430
4-inch Bullnose Universal Fitting—Kerfed.....F-430-K
4-inch Lintel F-450

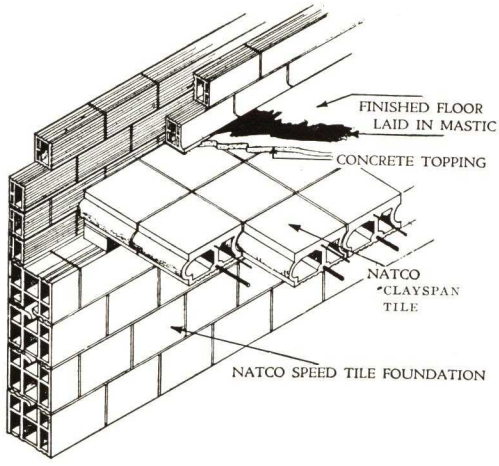
Exceptional Load-bearing Qualities

While comparatively light in weight, Natco Unglazed VersaTile has exceptional loadbearing qualities. It is very highly recommended as a facing material, where permanent attractiveness must be combined with low cost.

Estimates Gladly Given

Estimates of the quantities and cost of Natco Unglazed Loadbearing VersaTile will be gladly furnished on request.

Natco Floor Systems and Fireproofing



The Natco Bolted Clayspan System, a section of which is shown above, is recommended for industrial buildings of all kinds, where low cost is important

There is a Natco Structural Clay Tile Floor adaptable for any type of building. The Natcoflor System is a combination of special shape Natco Tile with 2-inch wide reinforced cement grout joints or ribs. It saves dead load, floor depth, plastering, labor costs and insurance.

Natco Flat Arch Floors are installed rapidly regardless of temperature. Holes may be cut at any time or tile units omitted for pipe work. Natco Segmental Arch Floors are particularly adapted to buildings where a heavy dead load is met.

The Natco Engineering Department will be glad to furnish floor tables and similar data, also suggest floor systems that will be most economical and effective for any type of building to be erected.

The purpose of beam, girder and column covering is to place a retardant to fire over the structural steel frame of buildings, and to provide a surface to plaster. Experience has proved that well-burned structural clay tile has no equal as such a protective covering. Standard shapes of all Natco Beam, Girder and Column Covering are carried in stock at all times.

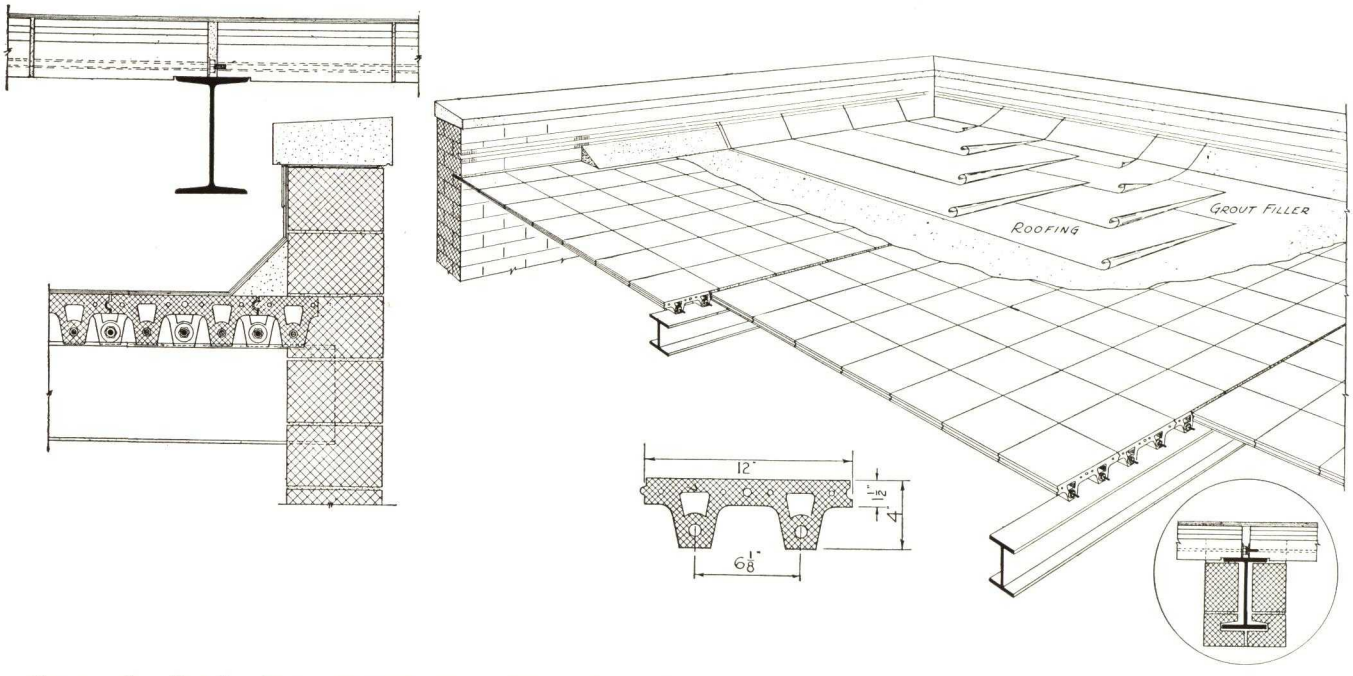
The Corporation furnishes schedules for the architect's approval and the contractor's use of just what will be furnished for each beam or girder shown on the final steel erection plans.

Natco Beam Girder and Column Covering saves dead load, promotes speed of erection, provides the best plastering surfaces, lowers insurance and retards corrosion.

Write for table of shapes to fit all standard beams.

Natco Dek-Tile

For Roofs of Industrial, Commercial and Factory Buildings



Construction Details—Natco Dek-Tile, Type 4W-13—Large drawing above shows perspective view of typical Dek-Tile installation. Note thin cement grout which fills joints. Detail in circle shows method of fireproofing supporting beams or purlins. In lower center, a dimensioned cross section of single unit is shown. View at upper left shows notched end Dek-Tile units for pitched roofs or for excessive vibration. Lower left shows method of staggering units in adjacent roof panels.

Natco Dek-Tile is made of clay in a process which results in a finely divided cellular structure after burning at approximately 2000° F.

The two openings through the legs accommodate tie rods and nuts for securing together a number of the individual square units for a desired span up to a recommended maximum of 8 feet. The standard width is 12 inches between tongue and groove sides, where adjoining assemblies fit together. Placement is made on adjacent spans so the tile legs are staggered and the projecting ends of the tie rods do not interfere.

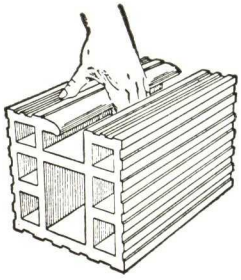
The tile weight is 13 pounds per square foot. Load ratings range from 66 pounds per square foot on an 8-foot span to 169 pounds per square foot on a 5-foot span. The coefficient of heat transmission, without insulation, is .50 and with 1 inch of insulation is .20, expressed in B.t.u. per hour per square foot per degree difference in temperature and includes a built-up roofing on top of the tile to a thickness of ⅜ inch.

Assembly of individual Dek-Tile units is made on the job, the end joints being cemented. A thin group is applied over top to seal the tongue-and-groove connections. The construction is free from condensation under normal conditions. The burned clay units are impervious to acid fumes and will not flake or disintegrate. Overhangs and drip board at eaves can be taken care of readily.

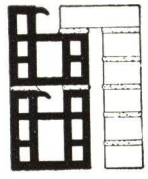
The Engineering Department of the Corporation will gladly co-operate in showing how Natco Dek-Tile can be economically and effectively used.

Natco Loadbearing Speedtile

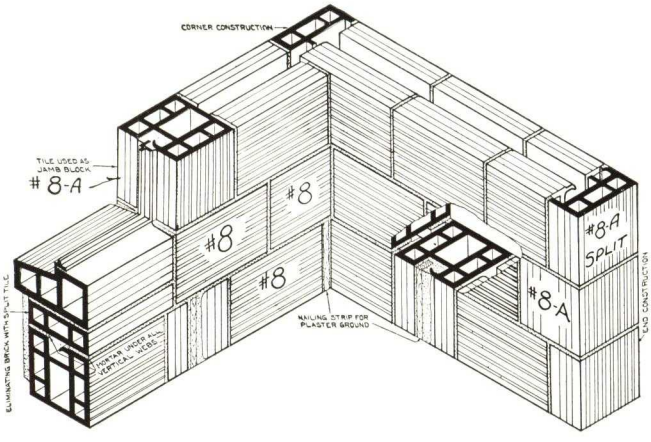
The Fastest Laid Tile in the World



No. 8 Natco Speedtile
Illustrates how handle promotes speed in laying



Natco Speedtile Header and Stretcher Units in Brick Face Construction



Natco Speedtile is primarily designed for loadbearing walls to receive exterior stucco and interior plaster applied directly to the tile surfaces. The handle feature, licensed under Wheeler Patent No. 1803158 enables the mason to pick individual units up with one hand and lay in the wall quickly and easily.

Natco Speedtile is furnished as follows:

No. 8—for 8-inch walls—7¾x7¾x12 inches.
No. 108—for 10-inch walls—9¾x7¾x12 inches.
No. 128—for 12-inch walls—11¾x7¾x12 inches.

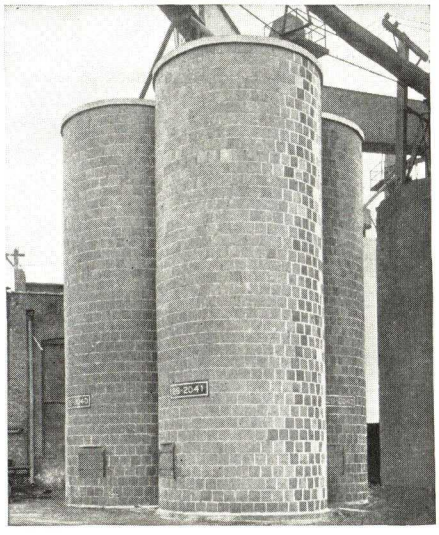
All the above are scored on interior and exterior faces. If sufficient tonnage is involved, tile can be supplied with smooth interior faces.

The No. 8-A—7¾x7¾x7⅞ Speedtile Closure Tile—is used for corners, window and door openings. Natco Speedtile Header Units, as illustrated, are also furnished for brick face construction. Here the recessed header tile permits a full bond header course to be laid.

Through the use of Natco Speedtile, low cost and rapid laying are united with permanence, resistance to decay and corrosion, fireproof qualities and high structural value.

Natco Segmentile

For Enduring Low Cost Storage Bins



Segmentile Storage Bins, 15 feet in diameter, 40 feet high, as used by the Barrett Manufacturing Company, Philadelphia, Pa.

Segmentile Bins erected 10, 20 or more years ago, are operating now as when first built

Storage bins of Natco Glazed Segmentile are repair-free, fireproof, dry, insulated and reasonable in price. They will withstand heavy, sudden and continuous stresses, both internal and external. They give economy of floor space, permanence, maximum capacity together with safety against rats and termites.

Inside glazed surfaces are smooth—there are no pockets to harbor dust. Double shell construction, with broken mortar joints resists passage of cold, heat and moisture. Free from painting and other maintenance expense.

Natco Clay Products—for Every Building Need

Natco Clay Products are available in shapes and sizes for every structural requirement. Natco Clay Roofing Tile, manufactured at our plant in Birmingham, Ala., is furnished in a great variety of soft, natural tones that make it particularly desirable for residences and commercial buildings. Natco XXX Loadbearing Tile, Natco Heath Cubes, Natco Segmentile for silos, storage bins and protection for oil tanks, Natco Clay Conduit for power and telephone lines—these are but a few of the many Natco Clay Products available for every type of construction.

Wherever used, Natco Structural Clay Tile and other products give maximum strength with minimum weight. All units are made of selected clay, cured and burned under the supervision of experienced ceramic engineers.

Any desired information will be gladly furnished on request.

AMERICAN CYANAMID AND CHEMICAL CORPORATION

STRUCTURAL GYPSUM DIVISION

EXECUTIVE OFFICES

TELEPHONE
Circle 7-0100

38 Rockefeller Plaza, NEW YORK, N. Y.

SALES OFFICES IN THE PRINCIPAL EASTERN CITIES

For Gypsteel Gypsum Pre-cast Floors and Roofs and Gypsteel Gypsum Plasters, see File Index

Products

GYPSTEEL GYPSUM PARTITION TILE.

Also Gypsteel Gypsum Soffit Slabs, Shoe Tile and Column Covering.

Construction Details and Installation

Our architectural service sheet No. 4 contains complete construction details and specifications and full directions for installation. A copy of this service sheet will be sent on application to any of our offices.

Facilities

The central location of our plant at Linden, N. J., makes rapid deliveries possible in the New York Metropolitan area. Orders will be delivered in 24 hours and if received in the morning can be delivered the same afternoon by high speed trucks.

AMERICAN CYANAMID AND CHEMICAL CORPORATION is one of the two largest producers of structural gypsum products in the United States.

GYPSTEEL GYPSUM PARTITION TILE

Where Gypsteel Gypsum Partition Tile May Be Advantageously Used

(1) Non-bearing partitions, walls of corridors, and column covering.

(2) Fire division walls.

(3) Covering for steel members, such as girders, beams, and columns.

(4) Heat ducts and light wells.

(5) Elevator, dumbwaiter, corridor and stairway enclosures.

(6) Wall furring (when split).

Special Advantages of Gypsteel Gypsum Partition Tile

The high quality of Gypsteel Gypsum Partition Tile is due to the combination of purity of the gypsum with a distinctive process of control that insures uniformity in the finished product.

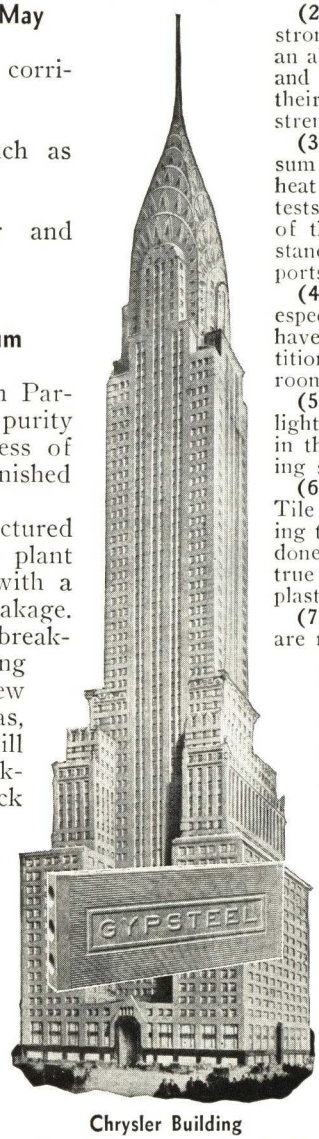
The great purity of gypsum manufactured by the Gypsteel Process at our Linden plant insures a stronger and tougher block, with a minimum waste from chipping and breakage.

Another factor tending to minimize breakage and waste is our express trucking service within and adjacent to the New York and Philadelphia metropolitan areas, whereby block is delivered from our mill within a few hours by truck. This truckload delivery assures clean, strong block free from breakage and waste.

The machinery by which Gypsteel Block is made at our Linden plant insures absolute accuracy and produces blocks true to size, accurately proportioned, and of uniform weight, strength and density.

General Advantages of Gypsum Partition Tile

(1) Fireproof—Gypsum Partition Tile are approved for first class fireproof construction by the Building Departments of all cities and have the highest rating in all Insurance Rating Bureaus.



Chrysler Building

One of the many modern buildings in which Gypsteel Partition Tile are used throughout

(2) Savings in Labor—Gypsteel Partition Tile are stronger than ordinary tile. Breakage is reduced to an absolute minimum with resulting savings in material and labor. Additional savings are achieved because of their accuracy in size and uniformity in composition, strength and weight.

(3) Heat Insulation—The great superiority of gypsum partition tile in preventing the transmission of heat has been frequently demonstrated by numerous tests under many conditions. Distinctly high qualities of thermal protection for embedded steel are an outstanding characteristic of gypsum partition tile. Reports of actual tests are available on request.

(4) Sound Insulation—Tests made many times, especially at the New England Conservatory of Music, have demonstrated the superior value of gypsum partition tile in retarding conduction of sound from one room to another.

(5) Light Weight—Gypsum Partition Tile are so light in weight that their use effects a large reduction in the total dead-load, and this permits of corresponding savings in the steel framework and foundations.

(6) Savings in Plaster—Gypsteel Gypsum Partition Tile are strong, they chip and break very little, meaning there is less mortar used, and less pointing-up to be done. Their uniformity of size and proportions assure true plaster base and effect a substantial saving in the plastering.

(7) Perfect Plaster Base—Gypsteel Partition Tile are made of gypsum, with a very small percentage of wood planer chips, and laid up in gypsum mortar. The chemical bond established between the gypsum tile, and the gypsum in both the mortar and plastering, produces a wall of great strength and rigidity.

(8) Easily Altered—Gypsum Partition Tile cuts with a saw, permitting of alterations being made in partitions with a minimum of expense and annoyance.

Sizes

All Gypsteel Partition Tile are 12x30 ins. They are furnished in standard thicknesses 2, 3 and 4 ins. solid and 3, 4, 5 and 6 ins. hollow.

WEIGHT PER SQ. FT. OF GYPSTEEL PARTITION TILE

Description of Gypsteel Furring and Partition Tile	Weight tile per sq. ft., lbs.	Weight mortar per sq. ft., lbs.	Total weight plastered one side per sq. ft., lbs.	Total weight plastered two sides per sq. ft., lbs.
2x12x30" Solid..	10.5	1.5	13.5	16.5
3x12x30" Hollow	11.0	2.0	14.0	15.0
3x12x30" Solid..	13.0	2.0	16.0	19.0
4x12x30" Hollow	13.0	2.5	16.0	19.0
6x12x30" Hollow	20.0	3.0	23.0	26.0

Note: Wt. plaster on one side, 3 lb. per sq. ft.

CONCRETE INFORMATION

SEARS, ROEBUCK & CO., Highland Park, Mich. Nimmons, Carr & Wright, Architects; Patterson Engineering Co., Contractor.

QUALITY CONCRETE
ARCHITECTURAL CONCRETE
TERRAZZO
CONCRETE ASHLAR
CONCRETE FLOOR FINISHES
PRECAST JOIST
CONCRETE FLOORS

PORTLAND CEMENT ASSOCIATION

A National Organization to Improve and Extend the Uses of Concrete

33 West Grand Avenue Chicago, Illinois

QUALITY CONCRETE GUIDE—With Tables of Quantities of Materials

Hardening of concrete mixtures is brought about by chemical reactions between the cement and water, the aggregates (sand, gravel, stone, etc.) being inactive ingredients used as fillers.

Use Proper Amount of Water—In proportioning concrete, the most important factor affecting strength, watertightness, durability and other qualities is the amount of mixing water used with each sack of cement. The less mixing water used, provided the concrete can be placed properly, the stronger, more watertight and more durable will be the concrete.

The proper amount of mixing water to use on a given job will usually depend on conditions of exposure. Experience and tests make it possible to make definite recommendations as in Table I for concrete made as recommended herein. At 28 days, such concretes should have compressive strengths of about 5,000, 4,000 and 3,000 lb. per sq. in. for 5, 6 and 7½ gal. of mixing water, respectively.

Allow for Moisture in Sand—Sand as used on the job nearly always contains considerable moisture which is free to combine with cement. This moisture must be considered as part of the mixing water. On jobs where sand is shipped from a screening and washing plant, the average moisture is around 4 or 5 per cent by weight. (1 gal. water = 8.33 lb.) For accurate control, tests should be made to determine exact amount of moisture. This should be subtracted from the total mixing water to determine correct amount to add at the mixer. Tests may be made by surface-drying samples of the sand, weighing before and after drying. There is generally so little moisture in coarse aggregate it can be neglected.

Mixes and Quantities of Materials by Weight—On large jobs the aggregates are measured by weight. Even on small jobs, contractors are finding the weight measurement gives better control, more uniform results and better economy so that the equipment quickly pays for itself. A platform scale with runways on two sides to facilitate running wheelbarrows or carts onto the platform is used.

Table II gives approximate proportions and quantities of materials by weight for the three classes of concrete suggested in Table I. The consistency that can be used will depend on the placing conditions. Proportions and quantities are therefore shown for stiff, medium and wet concrete.

In this table moisture in the sand is assumed to be 5 per cent by weight. The weight of sand has been corrected for this moisture. The corrected amount of water to add at the mixer after deducting moisture is also shown. This is the proper amount of water, which should be measured as accurately as possible.

Use a Workable Mixture—Should the proportions of sand and coarse aggregate selected give a mixture which is not workable, they should be adjusted to produce a mixture suitable for the job but *without exceeding the recommended amount of mixing water*. The concrete should be a plastic mass which holds together during handling and placing. Very stiff mixes can be used when concrete is placed by vibration. Mixtures which permit water to rise to the surface or permit mortar to separate from coarse material should be avoided whether placing is by hand or by vibration.

Mixes and Quantities of Materials by Volume—Moisture causes a very appreciable swelling of sand, up to 30 per cent or more. The amount of swelling is affected by the grading of the sand and the amount of moisture. Since these will vary from job to job, tables of proportions and quantities by volume can not be accurate. Table III gives volume proportions and quantities for a certain set of conditions as indicated. The quantities shown will not, of course, be accurate if the moisture or weight per cubic foot of the aggregates to be used is greatly different from the assumed values.

More accurate volumetric estimates can be made by using Table II as follows: First, weigh a cubic foot of each aggregate to be used, measured damp and loose. From Table II get the total batch weight of each aggregate. Divide these totals by the weight per cubic foot of the corresponding aggregate, as determined. This gives the cubic feet of sand and coarse aggregate per sack of cement.

Measure Material Accurately—Each ingredient should be accurately measured. Cement is furnished in sacks weighing 94 lb., considered as 1 cu. ft. Fractional bags should not be used unless they are weighed for each batch. As stated previously, weight measurement of aggregates gives best results. When scales are not available a cubic foot box may be used. Usually the proper amount of sand is measured by the box into one wheelbarrow and the proper amount of coarse aggregate into another wheelbarrow, observing or marking the level to which each is filled. Wheelbarrows are then filled to these levels for each batch, dispensing with the box.

Water may be measured by buckets or by the tank on the mixer if it has an accurate measuring device. The capacity of a bucket may be determined by filling it with water from a quart measure, placing a mark on the inside of the bucket to indicate the proper amount. (1 qt. = ¼ gal.) If a measuring device on the mixer is used, find out how much water is measured at each setting on the dial. This is done by discharging the water measured at each dial-setting into buckets of known capacity.

Use Good Materials—Sand, gravel, crushed stone or other aggregates for concrete work must be clean and free from clay, loam and dirt. Usually washed and screened materials assure best results. Mixing water should be clean enough to drink.

Coarse materials give more economical results than finer materials. This is because each particle must be thoroughly coated by cement paste and less paste is required for a given volume of coarse particles than for the same volume of small particles. Best results are secured with graded aggregates, that is, aggregates containing particles ranging from fine to coarse, with coarse predominating. Sufficient fine particles are necessary, however, to give workability and smooth surfaces. Generally, sand should contain from 10 to 20 per cent of particles passing a 50-mesh sieve.

Materials should be kept in separate piles. Cement should be kept in a dry place as in a building or on a platform raised off the ground and covered with tarpaulins.

Keep New Concrete Moist—The chemical reactions between cement and water require time. Under favorable conditions of moisture and temperature they continue indefinitely. Thus the strength, hardness, watertightness, durability and other qualities continue to improve under the right conditions.

For continued improvement concrete must be kept moist. When the water used in mixing is lost by evaporation, the chemical reactions cease. Concrete should be protected from early drying by leaving forms in place, covering exposed surfaces with wet sand, burlap or other materials and by sprinkling. This wet "curing" should be started as soon as possible without marring the surfaces and should be continued as long as possible—at least a week in most cases when standard portland cement is used and 2 or 3 days when standard high early strength portland cement or concrete is used.

TABLE I—RECOMMENDED AMOUNTS OF MIXING WATER FOR CONCRETE TO MEET DIFFERENT DEGREES OF EXPOSURE

Gallons Per Sack of Cement

Exposure \ Class of structure	Reinforced piles, thin walls, light structural members, exterior columns and beams in buildings.	Reinforced reservoirs, water tanks, pressure pipes, sewers, canal linings, dams of thin sections and all other watertight structures.	Heavy walls, piers, foundations, dams of heavy sections.
Extreme: (1) In severe climates like in northern U.S., exposure to alternate wetting and drying, freezing and thawing, as at the water line in hydraulic structures. (2) Exposure to sea and strong sulphate waters* in both severe and moderate climates.	5	5	6
Severe: (3) In severe climates like in northern U.S. exposure to rain and snow, and freezing and thawing, but not continuously in contact with water. (4) In moderate climates like southern U.S., exposure to alternate wetting and drying, as at water line in hydraulic structures.	6	6	6
Moderate: (5) In climates like southern U.S., exposure to ordinary weather, but not continuously in contact with water. (6) Concrete completely submerged, but protected from freezing.	6	6	7½
Protected: (7) Ordinary inclosed structural members; concrete below the ground and not subject to action of corrosive ground waters or freezing and thawing.	7½	6	7½

*Waters containing sodium and magnesium sulphates, often referred to as alkali waters, also sewage and similar liquids.

TABLE II—WEIGHT OF MATERIALS REQUIRED FOR CONCRETE

Consistency	Materials Per Sack of Cement						Yield—cu. ft. of concrete per sack cement	Materials Required Per Cubic Yard of Concrete				
	With Gravel			With Crushed Stone				Cement sacks	With Gravel		With Stone	
	Sand lb.	Gravel lb.	Water* gal.	Sand lb.	Stone lb.	Water* gal.			Sand lb.	Gravel lb.	Sand lb.	Stone lb.
WITH 1-INCH AGGREGATE												
5 Gallons Total Water Per Sack of Cement												
Stiff	189	307	3.9	225	273	3.7	4.09	6.6	1250	2025	1480	1805
Medium	167	271	4.0	199	241	3.8	3.75	7.2	1200	1950	1430	1740
Wet	149	241	4.2	177	215	3.9	3.46	7.8	1160	1875	1380	1670
6 Gallons Total Water Per Sack of Cement												
Stiff	252	360	4.6	297	318	4.2	4.91	5.5	1390	1980	1630	1750
Medium	224	320	4.7	263	283	4.4	4.50	6.0	1350	1920	1580	1700
Wet	201	286	4.8	236	253	4.6	4.15	6.5	1310	1860	1530	1640
7½ Gallons Total Water Per Sack of Cement												
Stiff	350	441	5.4	406	386	5.1	6.13	4.4	1540	1940	1790	1700
Medium	312	392	5.6	362	344	5.3	5.62	4.8	1500	1880	1740	1650
Wet	278	351	5.8	323	307	5.5	5.19	5.2	1450	1820	1680	1600
WITH 2-INCH AGGREGATE												
5 Gallons Total Water Per Sack of Cement												
Stiff	199	366	3.8	234	333	3.7	4.50	6.0	1190	2200	1400	2000
Medium	175	321	4.0	205	292	3.8	4.09	6.6	1160	2115	1350	1920
Wet	155	284	4.2	181	258	3.9	3.75	7.2	1120	2040	1300	1860
6 Gallons Total Water Per Sack of Cement												
Stiff	266	428	4.5	307	398	4.2	5.40	5.0	1330	2140	1540	1940
Medium	234	378	4.7	272	342	4.4	4.91	5.5	1290	2080	1500	1880
Wet	208	336	4.8	241	304	4.6	4.50	6.0	1250	2020	1450	1820
7½ Gallons Total Water Per Sack of Cement												
Stiff	369	525	5.2	424	473	5.0	6.75	4.0	1470	2100	1690	1890
Medium	325	464	5.6	373	418	5.2	6.13	4.4	1430	2040	1650	1840
Wet	290	413	5.8	332	372	5.5	5.62	4.8	1390	1980	1600	1780

*Amount of water to add allowing for moisture in sand.

This table is based on aggregates of 2.65 specific gravity and sand containing 5 per cent moisture by weight. No allowance has been made for waste.

Avoid Low Temperatures—Favorable temperature is the second requirement for continued improvement. The reactions between cement and water are more rapid at high than at low temperatures. Near freezing, the reactions almost cease. Concrete moist-cured at 70 deg. F. for a week may have twice the strength of similar concrete cured at 50 deg. F. In mildly cold weather, the water may be heated to raise the temperature of the concrete to 70 deg. F. In freezing weather, the water and aggregates should be heated so that the temperature of the mixed concrete is between 70 and 100 deg. F. It should then be kept above 70 deg. F. for 3 days or above 50 deg. F. for 5 days for standard portland cement concrete, and above 70 deg. F. for 2 days or 50 deg. F. for 3 days when standard high early strength portland cement or concrete is used. Salt or other chemicals should not be used to lower the freezing point of concrete.

General Suggestions—Mix concrete thoroughly. Do not overload mixers or operate them at speeds higher than recommended by the manufacturer. Continue mixing for at least a minute after all materials are in the mixer. Longer mixing gives more uniform results.

Handle and place concrete carefully to prevent the materials from separating. It should not be dropped into place more than 5 or 6 ft. Place it in the forms where it is to stay, and in horizontal layers, usually not over 1 to 2 ft. thick. Do not allow the concrete to flow over long distances in the forms, as this causes the materials to separate. Spade each layer to settle the concrete, release air, remove stone pockets and provide smooth surfaces along the forms.

Do not trowel or float concrete excessively while it is soft. Such working of the surface brings water and fine materials to the top which, upon hardening, has a tendency to check and crack. Best results are secured by allowing the concrete to stand until it is quite stiff before finishing.

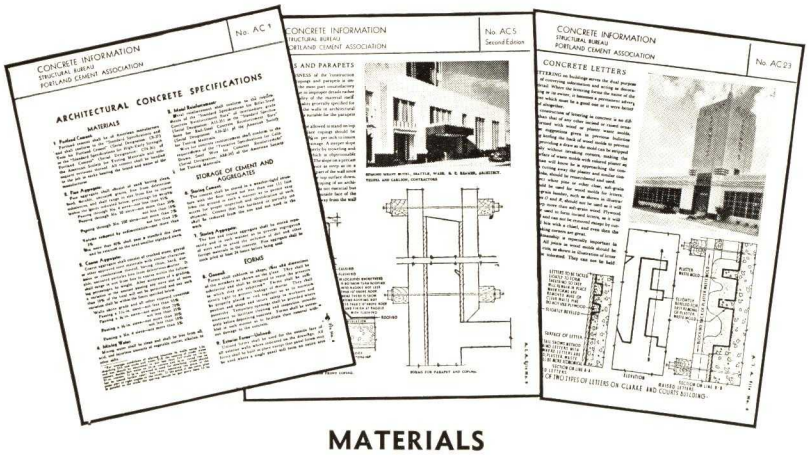
TABLE III—VOLUME OF MATERIALS REQUIRED FOR CONCRETE—AGGREGATES MEASURED BY DAMP LOOSE VOLUME

Consistency	Mix with gravel	Water* added with gravel—gal. per sack	Mix with crushed stone	Water* added with crushed stone—gal. per sack	Yield cu. ft. of concrete per sack cement	Materials Required for One Cubic Yard of Concrete							
						Cement sacks	With Gravel				With Crushed Stone			
							Sand		Gravel		Sand		Stone	
							cu. ft.	cu. ft.	cu. ft.	cu. ft.	cu. ft.	cu. ft.	cu. ft.	cu. ft.
WITH 1-INCH AGGREGATE														
Total Mixing Water 5 Gallons Per Sack of Cement														
Stiff	1-2.1-3.1	3.9	1-2.5-2.8	3.7	4.09	6.6	14.1	.52	20.4	.76	16.6	.62	18.2	.67
Medium	1-1.9-2.7	4.0	1-2.2-2.4	3.8	3.75	7.2	13.6	.50	19.7	.73	16.0	.59	17.6	.65
Wet	1-1.7-2.4	4.2	1-2.0-2.2	3.9	3.46	7.8	13.1	.49	19.0	.70	15.5	.57	16.9	.63
Total Mixing Water 6 Gallons Per Sack of Cement														
Stiff	1-2.8-3.6	4.6	1-3.3-3.2	4.2	4.91	5.5	15.6	.58	20.0	.74	18.3	.68	17.7	.66
Medium	1-2.5-3.2	4.7	1-3.0-2.9	4.4	4.50	6.0	15.1	.56	19.4	.72	17.7	.66	17.2	.64
Wet	1-2.3-2.9	4.8	1-2.6-2.6	4.6	4.15	6.5	14.6	.54	18.8	.70	17.2	.64	16.6	.62
Total Mixing Water 7½ Gallons Per Sack of Cement														
Stiff	1-3.9-4.5	5.4	1-4.6-3.9	5.1	6.13	4.4	17.2	.64	19.6	.73	20.1	.74	17.2	.64
Medium	1-3.5-4.0	5.6	1-4.1-3.5	5.3	5.62	4.8	16.8	.62	19.0	.70	19.5	.72	16.7	.62
Wet	1-3.1-3.5	5.8	1-3.6-3.1	5.5	5.19	5.2	16.3	.60	18.3	.68	18.9	.70	16.2	.60
WITH 2-INCH AGGREGATE														
Total Mixing Water 5 Gallons Per Sack of Cement														
Stiff	1-2.2-3.7	3.8	1-2.6-3.4	3.7	4.50	6.0	13.3	.49	22.2	.82	15.7	.58	20.2	.75
Medium	1-2.0-3.2	4.0	1-2.3-3.0	3.8	4.09	6.6	13.0	.48	21.4	.79	15.2	.56	19.4	.72
Wet	1-1.7-2.9	4.2	1-2.0-2.6	3.9	3.75	7.2	12.5	.46	20.6	.76	14.6	.54	18.8	.70
Total Mixing Water 6 Gallons Per Sack of Cement														
Stiff	1-3.0-4.3	4.5	1-3.4-4.0	4.2	5.40	5.0	14.9	.55	21.6	.80	17.2	.64	19.6	.73
Medium	1-2.6-3.8	4.7	1-3.0-3.5	4.4	4.91	5.5	14.4	.53	21.0	.78	16.8	.62	19.0	.70
Wet	1-2.3-3.4	4.8	1-2.7-3.1	4.6	4.50	6.0	13.9	.52	20.4	.76	16.3	.60	18.4	.68
Total Mixing Water 7½ Gallons Per Sack of Cement														
Stiff	1-4.1-5.3	5.2	1-4.7-4.8	5.0	6.75	4.0	16.5	.61	21.2	.79	19.0	.70	19.1	.71
Medium	1-3.6-4.6	5.6	1-4.2-4.2	5.2	6.13	4.4	16.0	.59	20.6	.76	18.4	.68	18.6	.69
Wet	1-3.2-4.2	5.8	1-3.7-3.8	5.5	5.62	4.8	15.6	.58	20.0	.74	17.9	.66	18.0	.67

*Corrected for free moisture carried by sand.

This table is based on the following assumptions: Absorption of aggregates 1 per cent by weight; free moisture in sand 5 per cent by weight; coarse aggregate surface dry; weight of sand 89 lb. per cu. ft. measured damp, loose; weight of coarse aggregate 99 lb. per cu. ft. measured loose.

ARCHITECTURAL CONCRETE SPECIFICATIONS



MATERIALS

(1) Portland Cement—Portland cement shall be of American manufacture conforming to the "Standard Specifications and Tests for Portland Cement" (Serial Designation: C9-38) or the "Standard Specifications for High-Early Strength Portland Cement" (Serial Designation: C74-38) of the American Society for Testing Materials and subsequent revisions thereof. All cement shall be handled to the job in sacks bearing the brand and name of the manufacturer.

(2) Fine Aggregate—Fine aggregate shall consist of sand having clean, hard, durable, uncoated grains, free from deleterious substances, and shall range in size from fine to coarse within the following percentages by weight:

Passing No. 4 sieve	95 to 100 per cent
Passing No. 16 sieve	45 to 70 per cent
Passing No. 50 sieve	15 to 30 per cent
Passing No. 100 sieve	3 to 8 per cent

Volume removed by sedimentation—not more than 3 per cent. Not more than 40 per cent shall pass a standard size sieve and be retained on the next smaller standard sieve.

(3) Coarse Aggregate—Coarse aggregate shall consist of crushed stone, gravel or other approved inert materials with similar characteristics or combination thereof, having clean, hard, durable, uncoated particles free from deleterious matter. After acceptance of a grading, a variation in the amount passing any sieve size of more than 10 per cent of the total will not be permitted and the grading shall be within the following percentages, by weight:

Passing a 1½-in. sieve	95 to 100 per cent
Passing a ¾-in. sieve	35 to 70 per cent
Passing a ⅜-in. sieve	10 to 30 per cent
Passing a No. 4 sieve	0 to 5 per cent

(4) Deleterious Substances—Deleterious substances shall not be present in the fine and coarse aggregates in excess of the amounts shown in the following table:

Aggregate	Deleterious Substance—Percentage by Weight			
	Clay Lumps	Coal and Lignite	Material Finer than No. 200 Sieve	Soft Fragments
Fine	1	½	4	....
Coarse	¼	½	1	3

(5) Soundness—The fine and coarse aggregates when subjected to five alternations of the sodium sulfate soundness test (A.S.T.M. Designation: C89-35T) shall not show an average weighted loss of more than 10 per cent for the fine aggregate and 13 per cent for the coarse aggregate, unless evidence satisfactory to the Architect is furnished that concrete of comparable proportions in which similar materials from the same sources were used, has been exposed to natural weathering for a period of at least 5 years without appreciable disintegration.

(6) Mixing Water—Mixing water shall be clean and shall be free from oil, acid, and injurious amounts of vegetable matter, alkalies, or other salts.

(7) Metal Reinforcement—Metal reinforcement shall conform to the requirements of the "Standard Specifications for Billet-Steel Concrete Reinforcement Bars" of Intermediate grade (Serial Designation: A15-35) or the "Standard Specifications for Rail-Steel Concrete Reinforcement Bars" (Serial Designation: A16-35) of the American Society for Testing Materials.

Wire for concrete reinforcement shall conform to the requirements of the "Standard Specifications for Cold-Drawn Steel Wire for Concrete Reinforcement" (Serial Designation: A82-34) of the American Society for Testing Materials.

STORAGE OF CEMENT AND AGGREGATES

(8) Storing Cement—Cement shall be stored in a weather-tight structure with the floor raised not less than 1 ft. from the ground in such manner as to permit easy access for proper inspection and identification of each shipment. Cement that has hardened or partially set shall be removed from the site and not used in the work.

(9) Storing Aggregate—Fine and coarse aggregates shall be stored separately and in such manner as to prevent segregation of sizes and to avoid the inclusion of dirt and other foreign materials in the concrete. Fine aggregate shall be stock piled at least 24 hours before being used.

FORMS

(10) General—Forms shall conform to shape, lines and dimensions of the members as shown on the plans. They shall be properly braced or tied together to maintain position and shape and insure safety to workmen and passersby. Forms shall be made sufficiently tight to prevent leakage of mortar. All exterior forms shall be detailed and drawings submitted to the Architect for approval before forms are fabricated or erected.

Studs and walers shall be not less than 2x4 in. S1S1E or S4S and shall be No. 2 or better Southern Pine, Douglas Fir or equal. All walers shall be doubled and the joints in the top and bottom pieces of each waler shall be staggered at least the spacing of the form ties. Vertical kick strips shall be used at the intersection of the walers at all external corners.

Forms shall be substantial and designed to resist the pressure to which they are subjected, but under no conditions shall studs be spaced more than 16-in. centers when used with 1-in. sheathing or ¾-in. structural grade plywood, and when used with plywood having the grain of the outer plies parallel to the studs the stud spacing shall not be greater than 12-in. centers. Walers shall be spaced not more than 24-in. centers and ties shall be spaced not more than 27-in. centers when used with double 2x4-in. walers. Ties shall have a minimum working strength of 3,000 lb. when fully assembled.

If a lift of forms is 12 ft. or more high and at all spandrel beams regardless of the height of the forms, double 2x6-in. vertical walers spaced not more than 10-ft. centers and extending the full height of the forms shall be bolted to every other set of horizontal walers to maintain the forms in straight, true alignment.

Temporary openings shall be provided where necessary to facilitate cleaning and inspection immediately before depositing concrete. Forms shall be so assembled that their removal will not damage the concrete.

(11) Exterior Forms—Unlined—Unlined forms shall be used for the outside face of all exterior walls where indicated on the drawings. All forms shall be built in place except that panel forms may be used where a single panel will form an entire area from one reveal to another. The use of panel forms will not be permitted where the joints between adjacent panels must be made on flat surfaces or in any other conspicuous locations.

The contact surface of all unlined forms shall be constructed of No. 1 common dressed and matched Longleaf Southern Yel-

low Pine or Douglas Fir boards.† This material shall be delivered to the site immediately on signing the contract and shall be sorted and graded on the job. The best 25 to 30 per cent of each load shall be selected for the outside face forms. The selected sheathing shall be stacked clear of the ground in layers separated by ¼-in. laths to facilitate air drying.

Note: Use the following paragraph in place of the preceding one and omit the fourth paragraph of this section if plywood is used for sheathing.

The contact surface of all unlined forms shall be constructed of ⅝ or ¾-in. 5-ply Douglas Fir plywood made with a waterproof glue and especially manufactured for concrete formwork. Full-sized sheets of plywood must be used except where smaller pieces will cover an entire area. All horizontal and vertical joints shall be backed solidly to prevent leakage and the edges of abutting sheets shall be nailed to the same stud or blocking with 6d box nails not farther apart than 8 in. Wherever panel forms are permitted by the Architect the joints shall be so constructed as to comply with the above requirements.

Vertical boarding shall have all vertical joints truly plumb and all horizontal boarding shall have all horizontal joints exactly level and without changes in level in any horizontal line. Portions of full-width boards will not be permitted adjacent to construction joints. The vertical joints in horizontal boarding shall not be over one board wide and shall be staggered at least 2 ft. and shall not be made except at studs or girts. Each board shall be driven up snug and nailed to every stud or girt with 8d box nails. All 6-in. sheathing shall be double nailed, and 8 and 10-in. boards shall be nailed at both edges and at center. The three top boards adjacent to horizontal construction joints shall not be erected until after the wetting operation specified in Sec. 15 has been completed, and to fill the remaining space each board shall be ripped to approximately one-third of the height between the top full-width board and construction joint. Form boards shall not be re-used a second time in contact with exposed surfaces unless approved by the Architect.

When the outside form is erected and pointed as may be required with a mixture of equal parts of beef tallow and portland cement and reinforcing is in place and before the inside form is erected the Architect shall be notified and the inside form shall not be placed until work already done is approved.

(12) Exterior Forms—Lined—The backing for form lining shall be constructed of a good grade of form lumber that is solid, straight, and free from defects that might impair its strength but need not be of the quality used for contact forms. Square-edged lumber may be used for form boarding in place of shiplap or T&G. The boarding for lined forms may be horizontal or vertical, depending upon convenience. Form sheathing shall be securely nailed to studs and so spaced as to prevent any bulging of the lining.

Non-warping fibre board not less than 3/16 in. in thickness, or ¼-in. plywood, shall be securely nailed to the form sheathing. All lining material shall be used in as wide pieces as possible. Areas less than 4 ft. in width shall be lined with a single width of fibre board.

Joints in lining and backing shall not occur at the same place and abutting edges of adjacent sheets shall be nailed to the same board. The lining material shall be nailed to the backing beginning at the center of the board and working toward the edges to prevent buckling. Three-penny blue shingle nails or similar nails with thin flat heads shall be used to attach lining material to sheathing. The nails shall not be farther apart than 8 in. along the edges and there shall be at least one nail for every square foot of surface. The edges of the lining shall be butted tight together, or joints between the sheets shall be filled with a mixture of equal parts of beef tallow and portland cement. Lining material may be re-used if it is in satisfactory condition and is approved by the Architect.

Presdwood shall be thoroughly wet with water at least 12 hours before being used. The water shall be applied to the screen side of the board and the board shall be stacked screen side to screen side.

(13) Ornamental Detail—Ornamental concrete work shall be placed integrally with the body of the concrete in wood molds or plaster waste molds. Moldings, column fluting and simple ornament shall be formed with wood, using No. 2 or better Idaho White Pine or equal. No material thicker than 2 in. shall be used without approval of the Architect and members making up wood molds shall be kerfed on the back wherever such members may become wedged between projections in the ornament. Molds shall be so constructed that joints will not be opened by slight movement and swelling of the wood. Joints in the molds shall be broken and made as inconspicuous as possible by pointing where necessary with water putty, patching plaster or similar material.

Intricate detail that cannot be formed with wood molds shall be cast in waste molds made from models approved by the Architect and shall be of such thickness and be so reinforced with fibre and a framework of wood that they may be readily handled without breakage. Waste molds shall be sized with two coats of thin shellac. Wherever waste molds require pointing or patching, the work shall be done with patching plaster and shall be shellacked after drying but damaged molds shall not be patched without approval of the Architect.

The plaster waste molds shall be carefully set in the forms and securely held in the exact position to reproduce the design shown on the drawings. The framing of the wood form above the mold shall be sufficiently strong to remove all load from the molds. Where wood forms adjoin waste molds, the wood shall be neatly fitted to the profile of the molds and all joints shall be carefully pointed to eliminate jointing.

(14) Form Ties—Form ties approved by the Architect shall be used. They shall have a minimum working strength when fully assembled of at least 3,000 lb. Ties shall be adjustable in length and of such type as to leave no metal closer than 1½ in. of the surface and they shall not be fitted with any lugs, cones, washers or other device to act as a spreader within the form or for any other purpose which will leave a hole larger than ⅞ in. in diameter or a depression back of the exposed surface of the concrete. Wire ties will not be permitted.

Ties that are to be pulled from the wall shall be coated with cup grease or other approved material to facilitate removal.

Tie rod clamps that are to be entirely removed from the wall shall be loosened 24 hours after the concrete is placed. All but a sufficient number of ties to hold the forms in place may be removed at that time, but the forms shall be held in position not less than 4 days, except that 2 days shall be considered sufficient if high early strength portland cement or concrete is used, but in no case shall ties or forms be removed until the concrete has hardened sufficiently to permit removal without damaging the concrete. Care shall be exercised to avoid spalling the concrete on the exposed surfaces. Ties of uniform diameter that are wholly withdrawn from the wall shall be pulled toward the inside face. Cutting ties back from the face of the wall will not be permitted. Tie rod holes shall be plugged as specified in Sec. 36.

(15) Wetting and Oiling Forms—The inside surface of wood forms shall be soaked continuously with clean water for 12 hours before any concrete is placed. In case forms have been erected for some time and have become dry so that joints have opened, then the forms shall be thoroughly soaked at least twice each day for at least 3 days prior to placing concrete. Plywood and Presdwood forms shall be treated with an approved form oil or lacquer. If oil is used all excess oil shall be wiped off with rags to leave the surface of the forms just oily to the touch. Plaster waste molds shall be greased with soft cup grease or cup grease thinned to a point where it can be applied with a brush by addition of a mixture of crystallized stearic acid and kerosene.

Concrete shall not be placed in any form until inspected by the Architect and permission is given to start placing.

(16) Removing Forms—All wall forms shall be removed when the concrete has thoroughly hardened, but in no case in less than 4 days except when high early strength cement or concrete is used, in which case forms may be removed after 2 days. Waste molds shall be left in place until thoroughly dry and until all placing of concrete has been completed and in no case less than 14 days and shall then be carefully stripped off to prevent damage to the concrete.

REINFORCEMENT

(17) Cleaning—Metal reinforcement before being placed shall be thoroughly cleaned of mill and rust scale and of coatings that will destroy or reduce the bond. Reinforcement appre-

† If an impression in the concrete of knots and other flaws in the wood is desired No. 2 boards may be used. For rough-textured surfaces re-sawed square-edged No. 1 or No. 2 boards, or boards surfaced one side and two edges may be used with the rough side of the lumber used as the contact surface. The width of form boards varies from 4 to 8 in., depending on the scale of the building and the effect desired. Boards of 1-in. nominal thickness are generally used. ⅝-in. 5-ply Douglas Fir plywood may be used in place of boards for sheathing where a surface practically free from joint lines is desired. Proper substitution should be made in the specifications to require the type of sheathing material to be used that will give the surface finish desired.

ciably reduced in section shall be rejected. Where there is delay in depositing concrete, reinforcement shall be reinspected and when necessary cleaned.

(18) **Bending and Straightening**—Reinforcement shall be carefully formed to the dimensions indicated on the plans. Cold bends shall be made around a pin having a diameter of six or more times the least dimensions of the reinforcement bars.

Metal reinforcement shall not be bent or straightened in a manner that will injure the material. Bars with kinks or bends not shown on the plans shall not be used. Heating of reinforcement will be permitted only when the entire operation is approved by the Architect.

(19) **Placing**—Metal reinforcement shall be accurately positioned and secured against displacement by using annealed wire of not less than No. 16 gage or suitable clips at intersections and shall be supported in a manner that will keep all metal away from the exposed surface of the wall. Nails shall not be driven into the outside forms to support reinforcement nor shall any other device for this purpose come in cntact with the outside form, except that wood strips shall be inserted between the reinforcement and the outside form at intervals to maintain the required clear distance. The strips shall be pulled up and removed from the wall as the level of the concrete rises. The minimum clear distance between any bar and the weather side of all exterior walls shall not be less than 2 in. At all wall surfaces not exposed to the weather a minimum of 1 in. of concrete cover over all steel shall be provided.

(20) **Splicing**—Wherever it is necessary to splice reinforcement otherwise than as shown on the plans, the character of the splice shall be decided by the Architect on the basis of allowable bond stress and the stress in the reinforcement at the splice. Splicing shall not be made on points of maximum stress nor shall adjacent bars be spliced at the same point.

All bars shall be lapped at least 40 diameters at all corners and at abrupt changes in directions of walls.

PROPORTIONING

(21) **General**—Fine and coarse aggregates shall be proportioned by direct weight upon suitable weighing devices approved by the Architect. Portland cement in standard unopened cloth or paper sacks as packed by the manufacturer may be considered as weighing 94 lb. per sack.

(22) **Measuring Ingredients**—All measurements of fine and coarse aggregates shall be made separately by weight. Proportioning aggregates for fractional sacks of cement will not be permitted unless the cement is weighed for each batch. Weighing equipment shall be arranged to permit making compensation for changes in the weight of moisture contained in the aggregates. Weighing equipment shall meet the approval of the Architect and shall be accurate within 1 per cent of the net load being weighed.

A satisfactory auxiliary device shall be used in connection with the scale beam to indicate or register at least the last 100 lb. of each of the aggregates required for the batch. The weighing hopper shall be equipped with a means of adjusting the volume of the compartment in which the aggregates are weighed.

Water shall be measured by an approved device capable of accurate measurement to 1 pt., plus or minus, of the total amount of water required per batch.

(23) **Water-Cement Ratio**—The proportioning of materials shall be based on the requirements for a plastic and workable mix with the use of not less than 5½ sacks of cement per cu.yd. and not more than 6½ gal.* of water per sack of cement including the surface water carried by the aggregate, expressed in terms of the quantity of cement. The water in the aggregate must be included in the quantity specified and subtracted from the amount added to the mixture. It shall be measured by methods satisfactory to the Architect which will give results within 1 lb. for each 100 lb. of aggregate. Moisture determinations shall be made on representative samples at least once each day and at such other times as the appearance of the aggregate or the mixed concrete indicates a change in moisture content.

(24) **Proportioning and Consistency**—The proportions of aggregate to cement shall produce concrete that can be thoroughly compacted. The slump shall not exceed 4 in. when vibration equipment is used and in no case shall the slump exceed 6 in.

The combined aggregate shall be of such composition of sizes that when separated by the No. 4 standard sieve the weight retained on the sieve shall be not less than one-half nor more than two-thirds of the total based on dry materials, except where adjustment is necessary in the opinion of the Architect for casting in special details.**

(25) **Trial Batches**—Full size trial batches shall be made in the mixer using the aggregates selected for the job to establish the correct proportions of the mix to give proper workability without exceeding the water-cement ratio and slump specified. If the desired workability is not obtained with the first combination of aggregates, then the proportions of fine and coarse aggregate shall be adjusted within the limits specified until the mix meets with the approval of the Architect.

(26) **Mixing**—Concrete shall be mixed in a batch mixer for not less than 1 minute after all the materials are in the mixer drum and until there is a uniform distribution of the materials and the mass is uniform in color and is homogeneous. The mixer shall rotate at a peripheral speed of about 200 ft. per minute and shall not be loaded above its rated capacity.

(27) **Central or Transit-Mixed Concrete**—Concrete from a central plant or mixed in transit-mixer trucks may be used if it complies with these specifications. The Architect shall have free access at all times to the batching and mixing plant for sampling of all materials and inspection of work performed for this project. Concrete shall be delivered in watertight containers which will not permit segregation of the materials. When delivered, the concrete shall be uniform throughout the mass.

DEPOSITING CONCRETE

(28) **Cleaning Equipment**—Before beginning a run of concrete, hardened concrete and foreign materials shall be removed from the inner surfaces of the mixing and conveying equipment. All conveyances, buggies, or barrows shall be thoroughly cleaned at frequent intervals during the placing of the concrete.

(29) **Transporting**—Concrete shall be handled from the mixer to the place of final deposit in carts, buggies or conveyors and shall not be spouted nor delivered by spout or trough from the hoists, nor dumped into carts with a free fall from the mixer of more than 3 ft. Every possible precaution shall be taken to prevent separation or loss of the ingredients while transporting the concrete. Delivery carts or buggies shall be kept on temporary runways built over the floor system and runway supports shall not bear upon reinforcing steel or fresh concrete.

(30) **Time of Placing**—Before starting work on any exposed concrete the Contractor shall construct complete and finish a section of basement wall or other unexposed wall where directed by the Architect as a demonstration panel, using the same materials and methods of construction as will be used for exposed surfaces.

Concrete shall not be placed until all reinforcement is securely and properly fastened in its correct position, nor until the forms have been inspected and approved by the Architect and form ties at construction joints have been retightened, nor until all bucks, sleeves, hangers, pipes, conduits, bolts, wires and any other fixtures required to be embedded therein have been placed and anchored by the Contractors, nor until the forms and reinforcement have been cleaned and the forms oiled or lacquered as specified in Sec. 15. Concrete shall not be placed at any time except under the direct supervision of the Architect nor outside of regular working hours unless the Architect is notified at least 4 hours in advance and Architect's superintendent or inspector is on the job.

(31) **Placing**—Special care must be exercised to prevent segregation of the concrete and to prevent splashing the forms or reinforcement with concrete and any such splashes or accumulations of hardened or partially hardened concrete on the forms or reinforcement above the general level of the concrete already in place must be removed before the work proceeds. Concrete shall be placed through "elephant trunks" (No. 20 gage galvanized iron chutes 4x12 in. in cross-section) equipped with suitable hopper heads. Chutes shall be of variable lengths so that the free fall shall not exceed 3 ft., and a sufficient number shall be placed in the forms to insure the concrete being kept level at all times. Sufficient illumination shall be provided in the interior of the forms so that the concrete at places of deposit is visible from the deck and runways. Plaster waste molds shall be protected by a canvas cover over the inside face of each mold which shall remain in place until the level of the

* In Southern climates where there is little or no freezing and thawing this may be increased by ½ gal. per sack of cement and the minimum cement content per cubic yard may be reduced to 5¼ sacks.

** In practically all cases the regular mix can be used for casting details. Where detail is intricate it may be necessary to reduce the amount of coarse aggregate but it is rarely necessary to reduce the maximum size.

concrete in the wall form reaches the middle of the mold or a point at least 1 ft. above the bottom of the mold. The canvas shall be slowly lifted, allowing the concrete to enter the mold. Every precaution shall be taken to completely fill the mold.

Concrete shall be spaded to thoroughly embed all reinforcement and fixtures. Spading shall be supplemented by rapping the forms with rubber hammers or wooden mallets or by light pneumatic or electric hammers (chipping guns) applied to the studs and wales at the level of the concrete being placed. When forms are removed, surfaces shall be even and dense, free from aggregate pockets or honeycomb.

Note: If concrete is to be vibrated substitute the following section for the last paragraph of Sec. 31.

(31a) Placing with Vibration—Concrete shall be placed with the aid of mechanical vibrating equipment. Where vibration is used it shall be applied directly to the concrete unless otherwise approved by the Architect. The intensity of vibration shall be sufficient to cause flow or settlement of the concrete into place. Vibration shall be applied at the point of deposit and in the area of freshly placed concrete. It shall be of sufficient duration to accomplish thorough compaction and complete embedment of reinforcement and fixtures as approved by the Architect.* To secure even and dense surfaces, free from aggregate pockets or honeycomb, vibration shall be supplemented by hand spading in the corners and angles of forms and along form surfaces while the concrete is plastic under the vibratory action.

(32) Construction Joints and Stoppages—The placing of concrete shall be carried on continuously between construction joints shown on the drawings.** If for any reason it shall become necessary to stop the placing of concrete at places other than those indicated, such places shall have the approval of the Architect.

Immediately after concrete placement is completed, the reinforcement projecting above the concrete shall be thoroughly cleaned. The surface of the concrete shall be level whenever a run of concrete is stopped. To insure a level, straight joint on the exposed surface of the walls a strip of 1-in. sheathing shall be tacked to the forms at the outside surface of the wall. The concrete shall be carried about ½ in. above the underside of the strip. About 1 hour after the concrete is placed, the strip shall be removed and any irregularities in the joint line shall be leveled off with a wood float and all laitance shall be removed with a stiff wire brush, leaving the aggregate exposed. Wherever horizontal construction joints are made, ⅝-in. bolts shall be provided 3 to 4 in. below the joint at the same spacing as regular ties with which to tighten the forms against the hardened concrete.

Vertical stops shall be placed at interior corners only, unless otherwise shown on the drawings or approved by the Architect.

(33) Depositing Against Other Concrete—Before depositing new concrete on or against concrete that has hardened, the forms shall be retightened, the surface of the hardened concrete shall be roughened as required, thoroughly cleaned of foreign matter and laitance, and moistened with water. The new concrete placed in contact with hardened or partially hardened concrete shall contain an excess of mortar to insure bond. To insure sufficient mortar at the juncture of the hardened and the newly deposited concrete, the cleaned and moistened surface of the hardened concrete, including vertical and inclined surfaces, shall first be slushed with a coating of neat cement grout against which the new concrete shall be placed before the grout has attained its initial set. Concrete for the first 6 in. of the next layer shall consist of a mix having one-half the amount of coarse aggregate in the regular mix.

(34) Protecting and Curing—All exposed surfaces of concrete shall be protected from premature drying and freshly placed concrete shall be protected against wash by rain. All concrete shall be kept wet for a period of 5 days after placing, except that 2 days' curing shall be considered sufficient if high early strength portland cement or concrete is used.

(35) Depositing in Cold Weather—Concrete when deposited shall have a temperature not below 70 deg. F. and not above 100 deg. F. In freezing weather suitable means shall be provided for maintaining the concrete at a temperature not lower than 70 deg. F. for 3 days, or 50 deg. F. for 5 days after placing, except when high early strength portland cement or concrete is used the temperature must be maintained at not less than 70 deg. F. for 2 days or 50 deg. F. for 3 days. The methods of heating the materials and protecting the concrete shall be approved by the Architect. Salt, chemicals, or other foreign materials shall not be mixed with the concrete for the purpose of preventing freezing.

(36) Patching—Any concrete work not formed as shown on the plans, or which for any reason is out of alignment or level or shows a defective surface, shall be considered as not conforming with the intent of these specifications and shall be removed from the job by the Contractor at his expense, unless the Architect grants permission to patch the defective area, which shall be done in accordance with the following procedure. Permission to patch any such area shall not be considered a waiver of the Architect's right to require complete removal of the defective work if the patching does not, in his opinion, satisfactorily restore the quality and appearance of the surface.

Immediately after removing forms, all concrete surfaces shall be inspected and any poor joints, voids, stone pockets or other defective areas permitted by the Architect to be patched and all tie holes shall at once be patched before the concrete is thoroughly dry. Defective areas shall be chipped away to a depth of not less than 1 in. with the edges perpendicular to the surface. The area to be patched and a space of at least 6 in. wide entirely surrounding it shall be wetted to prevent absorption of water from the patching mortar. The patch shall be made of the same material and of the same proportions as used for the concrete except that the coarse aggregate shall be omitted and white cement shall be substituted for a part of the gray cement to match the color of the surrounding concrete. The amount of mixing water used shall be as little as consistent with the requirements of handling and placing. The mortar shall be re-tempered without the addition of water by allowing it to stand for a period of 1 hour during which time it shall be mixed with a trowel to prevent setting.

The mortar shall be thoroughly compacted into place and screeded off so as to leave the patch slightly higher than the surrounding surface. It shall then be left undisturbed for a period of 1 to 2 hours to permit initial shrinkage before being finally finished. The patch shall be finished in such a manner as to match the adjoining surface. On exposed surfaces where unlined forms have been used the final finish shall be obtained by striking off the surface with a straight-edge spanning the patch and held parallel to the direction of the form marks.

Tie holes left by withdrawal of rods or the holes left by removal of ends of ties shall be filled solid with mortar. For holes passing entirely through the wall a plunger type grease gun or other device shall be used to force the mortar through the wall starting at the back face. A piece of burlap or canvas shall be held over the hole on the outside and when the hole is completely filled the excess mortar shall be struck off with the cloth flush with the surface. Holes not passing entirely through the wall shall be filled with a small tool that will permit packing the hole solid with mortar. Any excess mortar at the surface of the wall shall be struck off flush with a cloth.

(37) Cleaning Walls—All concrete surfaces shall be cleaned with a solution of muriatic acid containing not less than 5 per cent nor more than 10 per cent of acid by volume. The solution shall be applied to the surface previously wetted with clear water by scrubbing vigorously with stiff bristle brushes. Immediately after cleaning, all surfaces must be drenched with an abundance of clear water to remove all trace of acid.

In addition to the above treatment all smooth finish surfaces shall be given the following treatment:

Prepare a grout of about the proportions of 1 part cement to 1 part fine sand. Grout shall be of a consistency that will permit its application to vertical surfaces with a stiff bristle brush. The grout shall be brushed on the previously dampened surface to fill completely all air bubbles and indentations in the concrete. Allow grout to remain on wall until the cement has partially set, then remove excess grout with a steel trowel. After drying for an hour or longer, depending on weather conditions, rub the wall vigorously with burlap or completely clean the grout from the surface leaving pits filled, but there shall not be a visible film or grout on the surface.

Deep stains and incrustations of mortar or grout shall be removed by scouring with steel wool or fine steel brushes.

If any part of the above treatment is deemed unnecessary by the Architect because of the satisfactory appearance of the job, proper credit shall be allowed the Owner by the Contractor.

* As a rule, vibration in one place should be continued not less than 15 seconds, and not more than 1 minute.

** In the exterior walls it is desirable to locate horizontal construction joints at well defined lines such as window sills or heads, rustications or water tables. Joints at the tops of windows allow considerable shrinkage to occur in the concrete panel between the windows, thereby minimizing the possibility of shrinkage cracks.

The color of the painted walls of Cincinnati Union Terminal is matched in the beautiful, wear-resistant terrazzo floor made with white portland cement and colored marble aggregates. Alfred Fellheimer and Stewart Wagner, architects, New York; terrazzo by Martina Mosaic and Tile Co., Cincinnati.

TERRAZZO SPECIFICATIONS

(1) Base Slab—The surface of the structural base slab shall be struck off reasonably true at a level not less than __ in. below the required finish grade.

Note: Insert 2 in. for Method A or 3 in. for Method B.

(2) Samples—Samples of the aggregates shall be submitted for approval by the Architect. Samples of the terrazzo shall be made in duplicate for approval by the Architect.

(3) Aggregates—The aggregates shall be (insert the kind and color desired) and graded in sizes 1, 2 and 3.

(4) Color Pigments—Pigments shall be commercially pure natural or synthetic mineral oxides or other coloring materials manufactured for use in portland cement mixtures and proved satisfactory. Pigments shall be in the manufacturer's original container.

(5) Mixtures—The base for terrazzo finish shall be mixed in the proportions of 1 part of portland cement to 4 parts of clean, coarse sand.

The terrazzo mixture shall be in the proportions of 200 lb. of aggregate to 1 sack of cement with not more than 4 gal. of water and the proper amount of pigment to produce the approved color. The cement and pigment shall be mixed dry to a uniform color before adding the other materials. The terrazzo mixture shall be of the driest consistency possible to work into place with a sawing motion of the strike-off board or straightedge. Changes in consistency shall be obtained by changes in the proportions of aggregate and cement. In no case shall the specified amount of mixing water be exceeded.

(6) Placing—METHOD A—BONDED FINISH—The surface of the structural base slab shall be cleaned of all plaster and other materials that would interfere with bond and shall be thoroughly wetted. It shall be slushed with a neat cement grout thoroughly broomed into the surface. The underbed shall then be spread uniformly and brought to a level not less than ½ in. nor more than ¾ in. below the finished floor.

METHOD B—BROKEN BOND FINISH—The surface of the structural base slab shall be covered with a uniform layer of fine sand ¼ in. thick, and covered with an approved tarpaper overlapping at least 2 in. at all edges. The underbed shall then be spread uniformly and brought to a level not less than ½ in. nor more than ¾ in. below the finished floor.

While the underbed is in a semi-plastic state, the dividing strips shall be installed to conform to the designs shown on the drawings. The top of the strips shall be at least $\frac{1}{32}$ in. above the finished level of the floor.

The terrazzo mix shall then be placed in the spaces formed by the dividing strips and rolled into a compact mass by means of heavy rollers, adding aggregate if necessary so that the finished surface shall show a minimum of 70 per cent aggregate. Immediately after rolling, the surface shall be floated and troweled to an even surface disclosing the lines of the strips on a level with the terrazzo filling.

(7) Curing and Protection—All freshly placed concrete shall be protected from the elements and from all defacements due to building operations. As soon as the concrete has hardened sufficiently to prevent damage thereby, it shall be covered with at least 1 in. of wet sand or other covering satisfactory to the Architect, and shall be kept continually wet by sprinkling with water for at least 7 days when using standard portland cement and for at least 3 days when using high early strength portland cement. The temperature of the concrete at time of placing shall be above 70 deg. F. and it shall be maintained above 70 deg. F. for at least 3 days or above 50 deg. F. for at least 5 days when using standard portland cement and above 70 deg. F. for at least 2 days or above 50 deg. F. for at least 3 days when using standard high early strength portland cement.

(8) Surfacing—When the terrazzo concrete has hardened enough to prevent dislodgment of aggregate particles, it shall be machine rubbed, using No. 24 grit abrasive stones for the initial rubbing and No. 80 grit abrasive stones for the second rubbing. The floor shall be kept wet during the rubbing process. All material ground off shall be removed by squeegeeing and flushing with water.

A grout of portland cement, pigment and water of the same kind and color as the matrix shall be applied to the surface, filling all voids.

In not less than 72 hours after grouting, the grouting coat shall be removed and the surface polished to a satisfactory finish by machines using stones not coarser than No. 80 grit.

(9) Cleaning—After removing all loose material, the finish shall be scrubbed with warm water and soft soap and then mopped dry.

SPECIFICATIONS FOR CONCRETE FLOOR FINISH

(1) **Base Slab**—The surface of the structural base slab shall be finished reasonably true and struck off at a level not less than 1 in. below the required finish grade.

As soon as the condition of the concrete base permits and before it has fully hardened, all dirt, laitance and loose aggregate shall be removed from the surface by means of a wire broom which shall leave the coarse aggregate slightly exposed, or the surface otherwise roughened to improve bond with the topping.

When it is impossible to remove laitance and roughen the slab by brooming, the surface shall be cleaned and prepared for bond by chipping after the base has hardened.

Just prior to placing the finish, the base slab shall be thoroughly cleaned by scrubbing, to the satisfaction of the Engineer.

(2) **Portland Cement**—Portland cement shall be of American manufacture conforming to the "Standard Specifications for Portland Cement" (Serial Designation: C-9-38 or the "Standard Specifications for High Early Strength Portland Cement" (Serial Designation: C-74-38) of the American Society for Testing Materials, and subsequent revisions thereof.

(3) **Aggregates**—Fine aggregate shall consist of clean, hard sand or crushed stone screenings free from dust, clay, loam or vegetable matter and shall be graded from coarse to fine to meet the following requirements:

Passing ⅜-in. sieve	100 per cent
Passing No. 4 sieve	95 to 100 per cent
Passing No. 16 sieve	45 to 65 per cent
Passing No. 50 sieve	5 to 15 per cent
Passing No. 100 sieve	0 to 5 per cent

Coarse aggregate shall consist of clean, hard gravel or crushed stone free from dust, clay, loam or vegetable matter, and from coatings which will tend to weaken the bond. It shall contain no soft, flat or elongated fragments and shall be graded to meet the following requirements:

Passing ½-in. sieve	100 per cent
Passing ⅜-in. sieve	95 to 100 per cent
Passing No. 4 sieve	40 to 60 per cent
Passing No. 8 sieve	0 to 5 per cent

All aggregates shall be selected with care. Coarse aggregate shall be of an approved character and samples of proposed material shall be submitted to the Engineer for approval prior to use.

(4) **Mixture**—The mixture shall be 1 part of portland cement, 1 part of fine aggregate and 2 parts of coarse aggregate by volume. This nominal mix may be slightly varied, depending upon the local conditions, and as the Engineer may direct. If the aggregate is very coarse, the gravel or stone may be reduced, but in no case shall the volume of the coarse material be less than 1½ times the volume of the fine.

The mixture shall be determined by the Engineer and once established shall not be changed except upon his written order.

Not more than 5 gal. of mixing water, including the moisture in the aggregates, shall be used for each sack of portland cement in the mixture. Mixing of the concrete shall continue for at least 1½ minutes after all ingredients are in the mixer.

(5) **Consistency**—The concrete shall be of the driest consistency possible to work with a sawing motion of the strike-off board, or straight-edge. Changes in consistency shall be obtained by adjusting the proportions of fine and coarse aggregate within the limits specified. In no case shall the specified amount of mixing water be exceeded.

(6) **Placing and Compacting**—The base slab shall be thoroughly wetted just prior to the placing of the finish, but there shall be no pools of water left standing on the wetted surface. A thin coat of neat cement grout shall be broomed into the surface of the slab for a short distance ahead of the topping. The wearing course shall be immediately applied before the grout has hardened, and brought to the established grade with a straight-edge. After striking off the wearing course to the established grade, it shall be compacted by rolling or tamping, and then floated with a wood float or power floating machine. The surface shall be tested with a straight-edge to detect high and low spots, which shall be eliminated.

(7) **Finishing by Troweling**—Floating shall be followed by steel troweling after the concrete has hardened sufficiently to prevent excess fine material from working to the surface. The finish shall be brought to a smooth surface free from defects and blemishes. No dry cement nor mixture of dry cement and sand shall be sprinkled directly on the surface of the wearing course to absorb moisture or to stiffen the mix. After the concrete has further hardened, additional troweling may be required. This shall be done as may be directed by the Engineer.

14 years of trucking heavy loads did not injure this concrete floor finish. Crushed trap rock aggregate was used in this wearing course and the surface was finished by troweling. The hard wearing quality of this floor is largely due to the control of the water-cement ratio in mixing and adequate curing. This floor is at the plant of the Continental Can Company, St. Louis, Mo.

Note: Surfaces to be ground shall be swept with soft brooms after rolling to remove any water and surplus cement paste that may be brought to the surface. The wearing course shall then be floated and once lightly troweled, but no attempt shall be made to remove all trowel marks.

(8) **Finishing by Grinding**—After the wearing course has hardened sufficiently to prevent dislodgment of aggregate particles, it shall be ground down with an approved type of grinding machine shod with free, rapid-cutting abrasive stones to expose the coarse aggregate. The floor shall be kept wet during the grinding process. All material ground off shall be removed by squeegeeing and flushing with water.

Air holes, pits and other blemishes shall then be filled with a thin grout composed of 1 part of fine sand and 1 part of portland cement. This grout shall be spread over the surface and worked into the pits with a steel straight-edge, after which the grout shall be rubbed into the floor surface with the grinding machine.

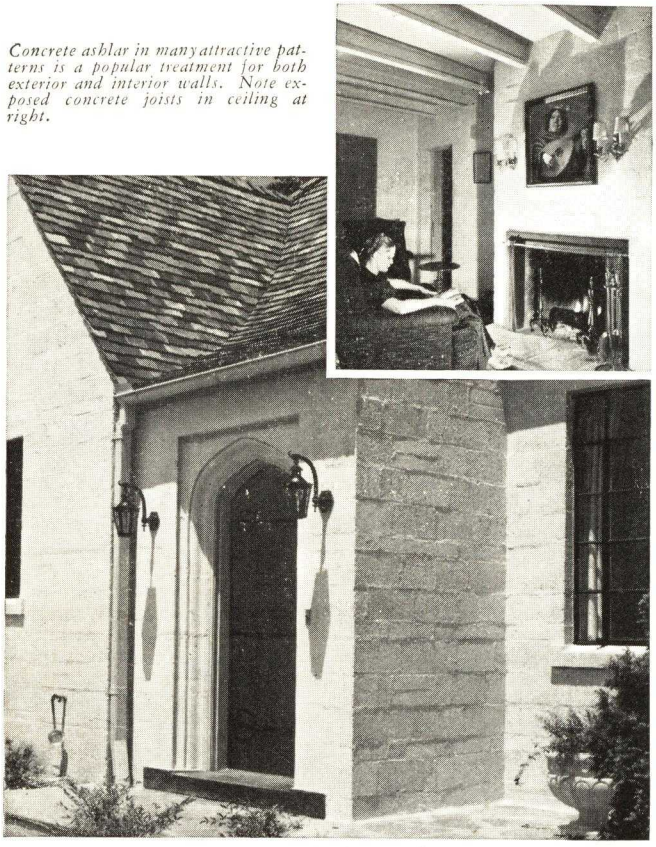
After all patch fillers have hardened for 7 days, the floor surface shall receive a second or final grinding to remove the film and to give the finish a polish. It shall then be thoroughly washed and all surplus material removed.

(9) **Curing and Protection**—All freshly placed concrete shall be protected from the elements and from all defacement due to building operations. The Contractor shall provide and use tarpaulins when necessary to cover completely or enclose all freshly finished concrete.

If at any time during the progress of work the temperature is, or in the opinion of the Engineer will, within 24 hours, drop to 40 deg. F., the water and aggregate shall be heated and precautions taken to maintain the temperature of the concrete above 70 deg. F. for at least 3 days or above 50 deg. F. for at least 5 days when using standard portland cement and above 70 deg. F. for at least 2 days or above 50 deg. F. for at least 3 days when using standard high early strength portland cement.

As soon as the cement has hardened to prevent damage thereby, it shall be covered with at least 1 in. of wet sand, or other covering satisfactory to the Engineer, and shall be kept continually wet by sprinkling with water for at least 7 days when using standard portland cement or for at least 3 days when using high early strength portland cement. In lieu of other curing methods, the concrete may be covered with asphalt-impregnated, waterproof paper. All seams of such paper shall be overlapped and sealed with tape.

CONCRETE ASHLAR



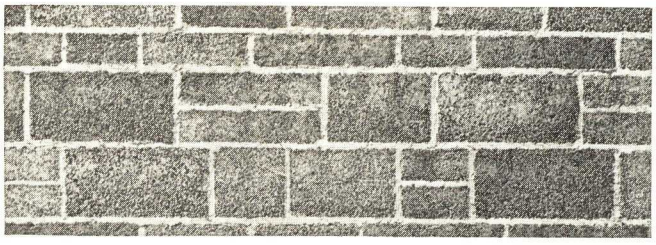
Concrete ashlar in many attractive patterns is a popular treatment for both exterior and interior walls. Note exposed concrete joists in ceiling at right.

Concrete ashlar is an exposed or painted concrete masonry wall employing one or more sized units in its construction. The units may be laid in regular courses, which is known as "coursed" ashlar. Laid in a random pattern, it is known as "random" ashlar. An almost endless number of attractive patterns can be produced by different arrangement of the units in the wall. The surface texture of the units can be varied over a wide range, from a smooth to a coarse, open texture, according to the effect the architect wishes to produce.

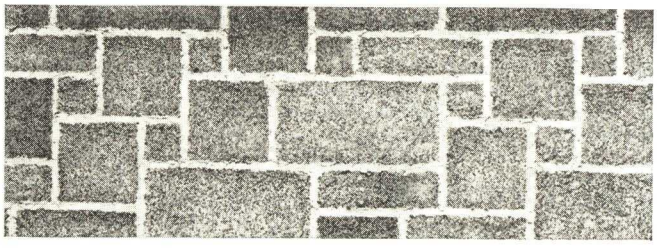
Usually the wall surface is given two or more coats of portland cement paint. For exterior exposed work, this paint helps seal the surface, producing a watertight wall. Any color desired can be obtained by adding proper mineral pigments to the paint. With many textures, patterns and colors available, this method of construction has become increasingly popular.

Suggested Concrete Ashlar Patterns—It is recommended that standard sizes of concrete masonry units or multiples of standard sizes be used wherever possible in ashlar work. The fewer sizes used, the greater the economy of the wall construction. Most manufacturers of concrete masonry units produce standard sizes and a number of multiples which may be worked into coursed or random ashlar patterns.

Many interesting wall variations may be developed by using only a few sizes of units. Mortar joints also may be handled to produce various effects, depending upon the size of the joints, the manner in which they are struck and the color of the mortar used.



Example of coursed ashlar. One 4-in. course to each pair of 8-in. courses. Formed by units with nominal face sizes of 8x16, 8x12, 8x8, 4x16, 4x12, and 4x8 in.



Random ashlar effect achieved by use of only four nominal sizes of units—8x16, 8x8, 4x12, and 4x4 in. Pattern repeats in each square yard of wall area.

PRECAST JOIST CONCRETE FLOORS

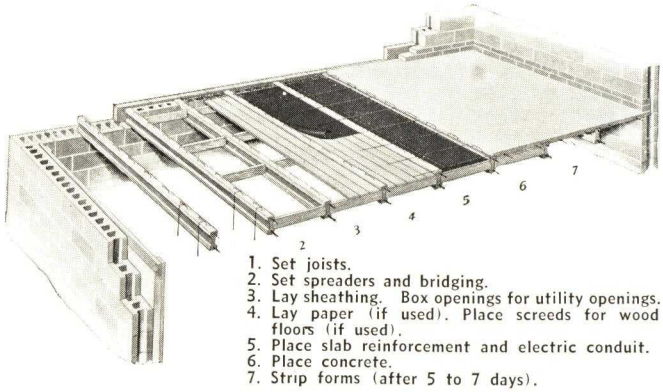
The precast joist concrete floor is a relatively new construction developed to lower the cost of concrete floors—especially suitable for dwellings, apartments and other buildings having relatively light loads. The floor consists of factory-made joists of reinforced concrete which support a concrete slab.

The joists are 8, 10 or 12 in. deep, according to the span and load to be carried, and are usually made in a products plant which delivers them to the site ready for the builder. Usual practice is to place a 2 or 2½-in. concrete slab over these joists. Slab and joists bond together, producing a strong, durable floor.

The underside of the precast joist floor may be left exposed, providing an attractive beamed ceiling effect. If color is desired, portland cement paint may be applied with spray or brush, or the joists may be stained and stenciled. The ceiling may be plastered if desired, plaster being applied on metal reinforcement attached to the underside of the joists.

With concrete as a subfloor any type of floor finish may be used—wood, concrete, tile, carpet, linoleum, rubber tiling, terrazzo or any other popular covering. The concrete itself can be colored and marked off in squares or other pattern, waxed and polished.

7 SIMPLE STEPS IN BUILDING A PRECAST JOIST CONCRETE FLOOR



1. Set joists.
2. Set spreaders and bridging.
3. Lay sheathing. Box openings for utility openings.
4. Lay paper (if used). Place screeds for wood floors (if used).
5. Place slab reinforcement and electric conduit.
6. Place concrete.
7. Strip forms (after 5 to 7 days).

PORTLAND CEMENT ASSOCIATION'S PUBLICATIONS OF INTEREST TO ARCHITECTS

S-4 SWIMMING POOLS

Fundamental principles in locating and constructing outdoor swimming and wading pools are described. Designs for rectangular and oval swimming pools and a circular wading pool are shown. Plumbing layouts and specifications are also included.

S-5 CONCRETE IN SCHOOLS

The designing of school plants to suit curricular programs is given a prominent place in this booklet. Structural layouts and details are illustrated showing architects and engineers how to use concrete to best advantage in design of schools. Contains 22 line drawings and 14 photographs.

S-8 CONCRETE FLOOR FINISHES

Contains information on construction, maintenance and repair of concrete floors. Specifications are included for bonded and terrazzo floor finishes.

S-28 THE NEW BEAUTY IN WALLS OF ARCHITECTURAL CONCRETE

Booklet shows possibilities of concrete as an architectural material for buildings of all types of occupancy and styles of architecture.

T-1 CONCRETE GUIDE

A manual on production of quality concrete for use by contractors and foremen. (Contents largely reproduced on second and third pages of this catalog section.)

T-3 VIBRATION FOR QUALITY CONCRETE

Vibration makes stiff concrete workable and helps to produce dense, watertight, durable concrete. Book covers methods, equipment, test data, recommended practice, bibliography.

T-12 DESIGN AND CONTROL OF CONCRETE MIXTURES

Explains water-cement ratio, field control of concrete and methods of designing mixtures and making tests. A.S.T.M. Standard Specifications for Concrete and Concrete Aggregates are included.

T-18 ANALYSIS OF SMALL REINFORCED CONCRETE BUILDINGS FOR EARTHQUAKE FORCES

Presents designers with a method of analysis in simplified form for the complete design of small reinforced concrete buildings.

T-20 CONTINUITY IN CONCRETE BUILDING FRAMES

Presents analyses of building frames of reinforced concrete subject to either vertical or horizontal load—wind pressure and earthquake. Quick, easy and convenient procedures suitable for office design practice are illustrated by many numerical problems.

T-21 FORMS FOR ARCHITECTURAL CONCRETE

Contains information pertaining strictly to formwork for architectural concrete buildings. Discusses in detail the design, construction and erection of architectural concrete building forms, the technique and craftsmanship of which differs considerably from that employed on structural concrete.

T-22 CONCRETE PILES

Discusses pile foundations, pile driving and formulas. The manufacture, handling and driving of precast concrete piles is described and illustrated by photographs. Cast-in-place bearing piles and precast sheet piles are discussed and data for the design of sheet pile bulkheads is given.

T-27 ARCHITECTURAL CONCRETE FOR SMALL BUILDINGS

Contains design and construction information especially applicable to small one and two-story commercial, industrial and public buildings. Plates are included showing form details and layouts.

P-2 CONCRETE ASHLAR WALLS

Features use of variable-sized masonry units to develop architecturally attractive walls for interiors or exteriors. Defines, describes and pictures concrete ashlar construction. Includes suggested patterns for random or coursed ashlar using standard-sized units and multiples thereof.

P-4 PORTLAND CEMENT STUCCO

Illustrates various types of stucco with color plates. Methods of applications and specifications.

P-25 CONCRETE FLOORS FOR RESIDENCES

A manual of residence floor construction describes the solid slab, concrete joist, tile and joist, precast concrete joist, and steel beam concrete floors.

P-26 FACTS ABOUT CONCRETE MASONRY

Manual of reliable, authoritative data, featuring strength tests of concrete masonry walls, specifications and data on construction, fire-resistance, heat-insulation, sound-absorption and transmission, and design data.

P-32 DESIGNED FOR CONCRETE

Fifty-five selected designs from the 1936 *Pencil Points*—Portland Cement Association architectural competition for the design of firesafe concrete homes. Also includes photos of completed houses and information on popular finishes for concrete walls and floors.

P-101 HOW TO DESIGN AND BUILD PRECAST JOIST CONCRETE FLOORS

Manual for use by architects and contractors on the general characteristics, design and construction of floors built with premolded joists and job-placed reinforced concrete slabs. Typical specifications and details.

P-143 REINFORCED CONCRETE HOUSES—DESIGN AND CONSTRUCTION DETAILS

Manual explaining the various construction details of the reinforced concrete house.

CONCRETE INFORMATION

PORTLAND CEMENT ASSOCIATION

A National Organization to Improve and Extend the Uses of Concrete

33 West Grand Avenue **Chicago, Illinois**

The Portland Cement Association is a research and service organization, supported by companies manufacturing a large proportion of the domestic production of portland cement. Inquiries are invited on any question involving the uses of cement or concrete. Address the general office or nearest district office listed.

ATLANTA, GEORGIA
Hurt Building

AUSTIN, TEXAS
1301 Norwood Building

BIRMINGHAM, ALABAMA
504 Watts Building

CHICAGO, ILLINOIS
33 West Grand Avenue

COLUMBUS, OHIO
50 West Broad Street

DES MOINES, IOWA
408 Hubbell Building

INDIANAPOLIS, INDIANA
610 Merchants' Bank Building

KANSAS CITY, MISSOURI
Gloyd Building

LANSING, MICHIGAN
Olds Tower Building

LINCOLN, NEBRASKA
321 Terminal Building

LOS ANGELES, CALIFORNIA
816 West Fifth Street

MILWAUKEE, WISCONSIN
735 North Water Street

MINNEAPOLIS, MINNESOTA
814 Northwestern Bank Building

NEW YORK, NEW YORK
347 Madison Avenue

OKLAHOMA CITY, OKLAHOMA
1421 First National Building

PHILADELPHIA, PENNSYLVANIA
1528 Walnut Street

PORTLAND, OREGON
618 Southwest Fifth Avenue

RICHMOND, VIRGINIA
1210 State Planters Bank & Trust Building

SAN FRANCISCO, CALIFORNIA
564 Market Street

SEATTLE, WASHINGTON
903 Seaboard Building

ST. LOUIS, MISSOURI
1306 Syndicate Trust Building

VANCOUVER, B. C., CANADA
Birks Building

WASHINGTON, D. C.
837 National Press Building

THE CARNEY COMPANY

MANKATO, MINN.

DISTRICT SALES OFFICES

CHICAGO DES MOINES DETROIT FARGO KANSAS CITY MINNEAPOLIS OMAHA ST. LOUIS

MILLS: MANKATO and CARNEY, MINN. QUARRIES: CARNEY, MINN.

CARNEY CEMENT for Masonry

The Pioneer of the Industry

THE CARNEY COMPANY has manufactured cement since 1883—and originated masonry cement as it is known today. Carney is unlike other cements—it is made from a deposit of natural cement rock particularly adapted to the manufacture of highly plastic, truly hydraulic masonry cement. This rock contains the correct proportion of lime and clay so that when burned and ground the resulting cement produces a lasting bond under all conditions of use—either above or below ground no further addition of lime is needed on the job. THE CARNEY COMPANY maintains elaborately equipped, efficiently manned chemical laboratories for the purpose of controlling constant uniformity of the product.

A Perfectly Balanced Mortar

Possessing all the desirable properties in masonry cement which embody ample strength, workability, and high water retaining capacity.

High, Water Retaining Capacity

The degree of plasticity or workability of a mortar is directly related to the water retaining capacity of the cement. Carney Cement has an extremely high, water retaining capacity. This attribute also assures a better bedding of the brick in the mortar—a feature which is particularly important where porous, highly absorbent brick is used.

Simple Mix

Correct mortar consistency is assured where Carney Cement is used. Mixing errors are avoided because of the simplicity of mixing. One part of Carney Cement mixed with three parts sand and water produces a perfect mortar. No other materials are required.

Tight, Efflorescence Resisting Joints

As stated above, the high water retaining capacity of Carney Cement assures better bedding of the brick in the mortar. This assures a tightly knitted wall. As a further precaution against water penetration through joints, calcium stearate, which is water repellent, is added to Carney Cement when manufactured. Efflorescence due to soluble salts which may be present in the sand or water is prevented by the calcium stearate component of Carney Cement.

Non-fading to Mortar Colors

Laboratory and field experience have proven that good mortar colors will not fade when used with Carney Cement Mortar.

Resistant to Frost Action

Results over a period of more than thirty years in the Northwest, where mortar is subject to many cycles of freezing and thawing, have demonstrated conclusively that Carney Cement mortar is resistant to frost action.

Quantity Requirements

Carney Cement is packed in cloth or paper sacks—one cubic foot each—four sacks to the barrel. One barrel, mixed with three parts sand, will lay up 800 to 1000 brick, depending upon the thickness of the mortar joint. Furthermore, waste from dropping and wall cleaning is largely eliminated where Carney mortar is used, due to its excellent plasticity.

Prominent Buildings in Which Carney Was Recently Used

City and Project	Architect
Aberdeen, S. D.—High School Auditorium	J. W. Henry & Ellerbe & Co. (Assoc.)
Amarillo, Tex.—Kirk-Whitcomb-Kirk Bldg.	Guy A. Carlander
Butte, Mont.—School	Bird & Van Teylingen
Cambridge, Minn.—Epileptic Colony Cottages	Sullivan & Orrfalt
Canandaigua, N. Y.—Veterans' Hospital	Private Plans
Capitan, Ft. Stanton, N. M.—U. S. Marine Hosp.	Private Plans
Cheyenne, Wy.—Supreme Court Bldg.	Wm. DuBois
Chicago, Ill.—Completion of Soldiers Field	Holabird & Root
Chicago, Ill.—Sanitary District Bldg.	F. L. Finlayson
Chicago, Ill.—U. S. Post Office	Graham, Anderson, Probst & White
Des Moines, Iowa—Iowa State Poultry Bldg.	Keffer & Jones
Denver, Colo.—U. S. Custom House	Private Plans
Eau Claire, Wis.—Gillette Rubber Co. Factory	Private Plans
Elwood, Ind.—Continental Can Co. Factory	Battey & Kipp, Inc.
Fort Sill, Okla.—Officers' Quarters, etc.	Private Plans
Grand Forks, N. D.—Central High School	Jos. Bell De Remer
Houston, Tex.—International Harvester Bldg.	Private Plans
Iowa City, Iowa—University Theater Bldg.	George L. Horner
Jacksonville, Ill.—State Dorm. and School Bldg.	C. Herrick Hammond
Kansas City, Mo.—Municipal Courts Bldg.	Wight & Wight
Knoxville, Iowa—U. S. Veterans' Hospital Bldgs.	Private Plans
Lewiston, Me.—U. S. Post Office	Private Plans
Manteno, Ill.—State Hospital Group	C. Herrick Hammond
Middletown, Pa.—Admin. Bldg. and Officers' Qtrs.	Private Plans
Milwaukee, Wis.—Bathhouse	Clas & Clas, Inc.
Minneapolis, Minn.—U. of M. Social Science Bldg.	C. H. Johnston
Minneapolis, Minn.—Sumner Field Homes Housing Project	Magney & Tusler and Associates
Moose Lake, Minn.—Fourth State Insane Hospital	Sund & Dunham
New Windsor, Ill.—High School	Albert Frederic Heino
Omaha, Neb.—Logan Fontenelle Homes Housing Project	Wm. L. Steel & Associates
Omaha, Neb.—University of Omaha Science Building	John Latenser & Sons, Inc.
Missoula, Mont.—Lowell and Central Schools	H. E. Kirkemo
Rapid City, S. D.—School	Perkins & McWayne
Robbinsdale, Minn.—School	Haxby & Bissell
Rochester, Minn.—Library	H. H. Crawford and P. P. Bross
Roseburg, Ore.—Veterans' Hospital	Private Plans
St. Louis, Mo.—Laclede Gas Light Co. Power Plant	Private Plans
St. Paul, Minn.—City Hall and Court House	Ellerbe & Co.
Sheridan, Wy.—Veterans' Hospital	Private Plans
Sioux Falls, S. D.—Washington High School	Hugill & Blatherwick
Superior, Wis.—Parkland Sanitarium	R. C. Buck, Inc.
Waverly, Iowa—Court House	Mortimer B. Cleveland
Wichita, Kan.—University of Wichita Auditorium and Commons Bldg.	Glen H. Thomas
Yankton, S. D.—Women's Ward Bldg.	Walter J. Dixon
Yellowstone Park, Wy.—U. S. Post Office	Private Plans

Specifications

All mortar shall be composed of one part Carney Cement, manufactured by THE CARNEY COMPANY, Mankato, Minn., and three parts clean, well-graded sand, mixed and measured by volume. The Carney Cement and sand, if mixed by hand shall be mixed thoroughly in a dry state.

For machine mix put sand and a portion of water in machine first, then add Carney Cement, after which additional water shall be added to produce a mortar of the desired workability under the trowel. When color is added, an approved brand of good double strength color shall be used in accordance with the directions of the manufacturer of the particular color used. Color should always be used as an addition and not as a replacement of cement.

In warm weather common brick shall be wetted; in cold weather sand and water shall be heated, and wall units kept dry and free from frost before being placed in wall.

Additional Information

Our technical staff will be glad to help with your masonry cement problems. Write THE CARNEY COMPANY, Mankato, Minnesota.

HY-TEST CEMENT COMPANY

Manufacturers of Hy-Test Masonry Cement

GENERAL OFFICES
PHILADELPHIA, PA.

Product

HY-TEST MASONRY CEMENT, a finely ground waterproofed plastic smooth-working cement for laying brick, stone, tile, terra cotta and other masonry units, combining the smoothness in lime and the strength in Portland cement.

MORTAR B VI
TRADE MARK

Composition

Hy-Test Masonry Cement is an intimate mixture of portland cement and hydraulic lime, into which is ground at the mill a recognized waterproofing compound which not only waterproofs but tends to reduce shrinkage of the mortar and increases bonding efficiency between the mortar and brick.

How It Is Used

The proper proportion is one part Hy-Test with three parts clean graded sand, by volume, with sufficient water added to bring to proper consistency. No admixtures of any kind necessary to produce a plastic mortar.

Advantages

The main function of any mortar is to efficiently and durably bond the brick together in order to keep water from penetrating through the joint.

Instead of making our own claims as to the advantages secured with Hy-Test cement, send 5¢ to the Superintendent of Documents, Washington, D. C., for a copy of U. S. Research Paper No. 683 which will give you unbiased facts of the results produced with 50 different kinds of mortars tested at the National Bureau of Standards in a three year investigation supported by the National Lime Association, Portland Cement Association, American Face Brick Association, and a group of Masonry cement manufacturers,—or write to the American Society for Testing Materials for copy of "Permeability Tests of Eight Inch Brick Walls," by L. A. Palmer, describing the amount of water passing through 240 eight-inch brick walls laid with different kinds of mortars.

Hy-Test Masonry Cement was used in the tests conducted at the Bureau of Standards and is described in the above mentioned papers as Mortar No. B VI.

The investigation definitely established that most water penetrates a wall "between the mortar and the brick" and that therefore a mortar must have (a) bonding efficiency, (b) flexibility, (c) low shrinkage (volume change) subsequent to hardening, (d) must be able to maintain the bond under weather exposure of freezing and thawing, (e) high water retaining capacity.

(a) Bonding Efficiency—The American Society for Testing Materials Reprint containing the article "Permeability Tests of 8-In. Brick Wallettes," by L. A. Palmer, prints tables showing Mortar No. B VI as having produced the greatest extent of adhesion with a diversified range of brick, because the figures definitely show that the average penetration of water through a series of brick walls laid with Mortar No. B VI was less than with any other type of mortar.

(b) Flexibility—U. S. Research Paper No. 683, page 641 rates Mortar No. B VI as one of the mortars that gave the most concordant results on flexibility, or stretching properties.

(c) Low Shrinkage—U. S. Research Paper No. 683, page 636 rates Mortar No. B VI among those mortars having low volume change (low shrinkage) subsequent to hardening.

(d) Bond Durability—U. S. Research Paper No. 683, page 638 rates Mortar No. B VI as having the highest possible record in durability of bond after freezing and thawing for a period of one year.

(e) Water Retaining Capacity—U. S. Research Paper No. 683, page 641 rates Mortar No. B VI as one of the mortars having high water retaining capacity or the power to resist undue suction by highly porous brick.

Strength

The highest stress on brickwork permitted by any Building Code in America is 250 lbs. per square inch or 18 tons per square foot at 28 days. Hy-Test mortar will withstand 6 times this load in the same period when cured under normal conditions. It has been approved by the Building Departments of every important city in the United States.

Specification

Mortar—"All mortar for interior and exterior brickwork below and above grade, for rubble stone, interior partitions and other masonry units shall be composed of Hy-Test Waterproofed Masonry Cement (B VI grade) and clean graded sand, with enough water to bring to proper consistency. Three cubic feet of sand shall be added to each bag of Hy-Test cement. If mortar is mixed by hand the cement and sand shall first be thoroughly mixed dry before the water is added.

Waterproofing must be ground into the cement at the mill. It is of utmost importance to thoroughly wet all brick that absorb water rapidly. In cold weather proper precautions shall be taken to protect the green work from freezing."

General Information

Write to the HY-TEST CEMENT COMPANY, Fox Building, Sixteenth and Market Streets, Philadelphia, and we will send gratis a copy of U. S. Research Paper No. 683, and American Society for Testing Materials booklet containing the article "Permeability Tests of Eight-Inch Brick Wallettes" by L. A. Palmer.

KOSMOS PORTLAND CEMENT COMPANY

INCORPORATED

Manufacturers

Kosmos Portland Cement—Kosmos High Early Strength Cement

Kosmortar—Kosmos Waterproofed Portland Cement

SALES OFFICE
LOUISVILLE, KY.

MILLS
KOSMOSDALE, KY.

KOSMORTAR—A MASONRY CEMENT

The Product

Kosmortar is essentially a carefully proportioned mixture of portland cement and hydrated lime. Kosmos Portland Cement is the basic material and a plastic hydrated lime is intimately pulverized with it. This mixture is scientifically blended with a water repellent material.

Kosmortar is made especially for masonry work of all kinds. When mixed with sand and water only, it is ready for immediate use.

Uses

Kosmortar is specified in the place of job-mixed portland cement-lime mortars because of its demonstrated advantages. Kosmortar is used with equal success in mortar for laying masonry units of all types—brick, tile, terra cotta, stone, concrete, and for stucco. It is suitable for load-bearing, foundation, or parapet walls and even free-standing stacks.

To Mix

Kosmortar should be mixed as needed, 1 sack of Kosmortar with 3 cu. ft. of sand with water added for proper consistency. No further additions are required. No slaking or soaking.

Package and Shipments

Each sack of Kosmortar weighs 75 lbs. gross and contains approximately 1 cu. ft.; 4 sacks make a barrel of 300 lbs., which is the unit of sale. 167 barrels is a minimum carload.

Note: Kosmos Products may be shipped in mixed carloads.

Quantity

When mixed with 3 parts of sand, 4 to 6 sacks of Kosmortar (5 sacks on the average) will lay 1000 bricks. The actual quantity depends on the quality of the sand, thickness of the wall, width of the joints, etc.

Plasticity

Any one who sees Kosmortar being used is impressed both by the ease with which the mortar is handled and the excellent results obtained with this exceptionally plastic cement.

Waterproofed

Kosmortar contains an efficient water repellent material. Besides increasing the impermeability of the mortar, this ingredient gives a water-retaining capacity to the mortar so essential when laying porous masonry units. No admixtures are needed on the job.

Strength

Because of its portland cement content, a Kosmortar bond increases in strength with age, becoming stronger than the brick itself. Kosmortar mixed 1:3 develops strength greater than that required by the building code of any city and exceeds requirements adopted by the American Society for Testing Materials (Specification C 91-32T) and by the United States Government (Federal specification SS-C-181a for masonry cements).

Bond

The qualities essential for a strong, tight and durable mortar bond are contained in Kosmortar: (1) Because it is extremely plastic and allows even distribution of mortar and uniform bedding of brick; (2) because its water retaining capacity prolongs the mortar hardening period, thus improving curing and preventing too rapid stiffening of the mortar; thus insuring maximum adhesion and a minimum of volume change resulting in practical elimination of shrinkage cracks; (3) the basic materials have an important influence—portland cement increases strength and durability (weather-resistance); lime increases plasticity, elasticity and watertightness.

Color

Kosmortar is very light gray in its natural state. Colored joints may be obtained by the use of pure mineral pigments. Kosmortar itself will not cause fading or efflorescence. Furthermore, the water repellent material in it tends to prevent efflorescence from any cause.

Uniformity

Kosmortar gives assurance that the mortar will be uniform; it is proportioned at the factory. Mortar cannot be used satisfactorily in an oversanded or excessively wet condition. It is necessary to use the proper amount of Kosmortar.

Below Grade

Kosmortar is a hydraulic, water repellent cement. In masonry below ground the mortar will satisfy the most stringent requirements.

Specifications

(1) All mortar shall consist of Kosmortar (manufactured by the Kosmos Portland Cement Company) and sand.

(2) Use clean, sharp mason's sand, mixed by measure in the proportion of 1 sack of Kosmortar to 3 cu. ft. of sand.

(3) The Kosmortar and sand shall be mixed dry until the mixture is of a uniform color throughout.

(4) Only enough clean water shall be added to make mortar of the proper consistency for the work at hand.

(5) Kosmortar shall be delivered in the original containers and from fresh stock.

(6) Mortar colors, if required, shall be mixed with the mortar in the proportion and manner specified by the color manufacturer.

(7) In freezing temperatures the sand and water shall be heated and the work protected, if necessary, to assure setting of the mortar before the water in it freezes. Masonry units and sand containing any frost shall not be used. In hot weather common brick shall be wetted.

Note: Sand for all mortar shall be well graded and with sharp angular particles, free from vegetable matter, loam (not over 5%), and large pebbles.

Additional Information

On any feature not covered above to your satisfaction, will be gladly sent upon request. We can send you a list of prominent Kosmortar buildings erected since 1922.

LOUISVILLE CEMENT COMPANY

INCORPORATED

GENERAL OFFICES

Speed Building, LOUISVILLE, KY.

DISTRICT SALES OFFICES

CHICAGO, ILL., 228 No. La Salle St. DETROIT, MICH., 600 Murphy Building NEW YORK, N. Y., 101 Park Ave

MILLS: BRIXMENT, N. Y., and SPEED, IND.

BRIXMENT for Masonry

Brixment for Masonry

Brixment is a waterproofed mason's cement that combines the characteristics of portland cement and lime, having both strength and plasticity.

When mixed with sand and water, it makes perfect mortar for any type of brick, tile, or stone masonry and for stucco.

How to Mix

The proper mix is 1 part Brixment and 3 parts sand, measured by volume, with water added for proper consistency. Neither portland cement nor lime is added.

How to Estimate

Brixment is packed in cloth or paper sacks. Each sack contains 1 cu. foot. There are 4 sacks to a barrel.

When mixed with 3 parts of sand, a barrel of Brixment will lay, approximately 800 brick.

Uniformity

The use of Brixment is the architect's assurance that all mortar will be uniform in strength and color and that his specifications will be accurately followed. If oversanded, Brixment mortar works short and, since there is no lime in the mix, the necessary plasticity can be had only by using the proper amount of Brixment.

A FEW BRIXMENT BUILDINGS

Dupont Cellophane Co. (Office Building), Buffalo, N. Y.
Columbian Mutual Life Ins. Building, Memphis, Tenn.
Coast Guard Academy, New London, Conn.
Fine Arts Building, Jackson Park, Chicago, Ill.
Westinghouse Laboratory, East Pittsburgh, Pa.
U. S. Veterans' Hospital, Togus, Me.
Baltimore City Hospital, Bay View, Md.
Odd Fellows Home, Concord, N. H.
U. S. Veterans' Hospital, Waco, Tex.
U. S. Gypsum Co., Asbestos Plant, East Chicago, Ind.
American Can Co., Factory Building, Chicago, Ill.
Republic Steel Nail Mill, Chicago, Ill.
Seagram Distilleries, Louisville, Ky.
Pittsburgh Plate Glass Co. Plant, Crystal City, Mo.
National Biscuit Co., New York, N. Y.
Eastman Kodak Plant, Five Additions, Rochester, N. Y.
Frigidaire Plant, General Motors, Dayton, Ohio
Fisher Body Plant, Memphis, Tenn.
U. S. Post Office, Baltimore, Md.
Airplane Hangars, Roosevelt Field, Long Island, N. Y.
Fox Paradise Theatre, New York, N. Y.
Boulevard Gardens Housing Project, Woodside, L. I., N. Y.
Church of the Covenant, New York, N. Y.
Glenn L. Martin Airplane Factory, Baltimore, Md.

Strength

Mortar made of 1 part Brixment, 3 parts sand (no lime, no portland) has greater strength than that required for the heaviest load-bearing walls.

Its strength increases with age, becoming greater than that of the brick itself. When tested in piers, it approaches that of straight 3-to-1 portland cement mortar. This makes it suitable for foundation, load-bearing, or parapet walls and even for tall, free-standing stacks.

Plasticity

Any bricklayer will testify to the outstanding plasticity of Brixment mortar. This plasticity assures neat, economical brickwork.

Waterproofed

Brixment is thoroughly waterproofed during manufacture. Therefore no waterproofing admixtures are necessary on the job.

Bond

Brixment mortar assures a strong, durable bond with the brick: (1) Because it is so plastic that it allows a more complete bedding of the brick; (2) because it hardens slowly enough to permit deeper penetration into the pores of the brick and (3) because it has high water-retaining capacity. This keeps the brick from sucking the water out of the mortar too fast, thus preventing the mortar from congealing and shrinking away from the brick.

No Efflorescence

Brixment is virtually free from the soluble salts which cause efflorescence. Furthermore, the waterproofing in Brixment also tends to prevent salts in the sand and brick from working to the surface.

Mortar Colors

Brixment does not fade mortar colors. It contains none of the strong acids, alkalies or salts so frequently the cause of fading and of efflorescence in other mortars.

The waterproofing combined with Brixment when manufactured is a further protection to the color because it prevents water from penetrating the mortar and leaching out the pigments.

Below Grade

Being a true hydraulic cement, water-repellent and used without lime, Brixment mortar is ideal for walls below grade.

Specifications

(1) All mortar shall be composed of Brixment, manufactured by the Louisville Cement Company, and sand. (2) The mortar shall be mixed by measure in the proportions of 1 part Brixment to 3 parts clean, sharp sand. (3) The Brixment and sand shall be mixed dry until the color of the mass is uniform. Clean water shall then be added to make mortar of the proper consistency for the work to be done. (4) If mortar colors are used, they shall be mixed with the mortar in the proportion and manner specified by the manufacturer of the particular color used. (5) In freezing weather the sand and water shall be heated.

Additional Information

about any of the above points, will be gladly sent you on request. We have available also a list of several thousand Brixment buildings.

MEDUSA PORTLAND CEMENT COMPANY

Manufacturer of Medusa Products

1000 Midland Building, CLEVELAND, OHIO

SALES OFFICES

CHICAGO, ILL., 1530 Builders Bldg.
GRAND RAPIDS, MICH., Grand Rapids Trust Bldg.
MANITOWOC, WIS., 16th and River St.
MINNEAPOLIS, MINN., 803 Pence Bldg.
NEW YORK, N. Y., 1521 New York Central Bldg.
PITTSBURGH, PA., Oliver Bldg.
WASHINGTON, D. C., 817 Woodward Bldg.
YORK, PA., 25 North George St.
TOLEDO, OHIO, 912 Ohio Bldg.

PLANTS

BAY BRIDGE, OHIO
WAMPUM, PA.
TOLEDO, OHIO
MANITOWOC, WIS.
DIXON, ILL.
YORK, PA.
NEWAYGO, MICH.

THE 12 MEDUSA PRODUCTS

MEDUSA GRAY PORTLAND CEMENT.

MEDUSA WATERPROOFED GRAY PORTLAND CEMENT.

MEDUSA "MEDCO" HIGH EARLY STRENGTH CEMENT.

MEDUSA WHITE PORTLAND CEMENT.

MEDUSA WATERPROOFED WHITE PORTLAND CEMENT.

MEDUSA STONESET, the Non-staining Waterproofed Cement.

MEDUSA BRIKSET, the Waterproofed Masonry Cement.

MEDUSA PORTLAND CEMENT PAINT.

MEDUSA FLOOR COATING.

MEDUSA-LITE, the Super Flat Wall Finish.

MEDUSA WATERPROOFING POWDER.

MEDUSA CONCENTRATED WATERPROOFING PASTE.

MEDUSA WHITE PORTLAND CEMENT

Plain and Waterproofed

Medusa Plain White Portland Cement

The MEDUSA PORTLAND CEMENT COMPANY was the first manufacturer to produce for commercial purposes a true white portland cement. The material has been sold and shipped continuously to all parts of the world since 1907.

Quality—MEDUSA WHITE PORTLAND CEMENT is a true portland cement which passes the requirements for portland cement of the United States Government and the American Society for Testing Materials. The only difference between gray portland cement and Medusa White is that the white is *pure white* and non-staining.

Where to Use—It produces a concrete and mortar of the same great strength as regular gray portland cement and should be used in place of gray cement when pure white or colored effects are desired. Many beautiful colored effects can be secured through the use of colored aggregates or pure mineral colors.

Mortar Specifications—For a non-staining mortar for the setting and pargeting of cut stone, we recommend:

1 part Medusa White Portland Cement

3 parts clean sand, crushed white marble or screened limestone chips, graded so that all coarse particles will pass a 1/8-in. screen with no more than 15% passing a No. 60 screen.

With every bag of MEDUSA WHITE PORTLAND CEMENT use 10 lbs. of hydrated lime or one-fifth part by volume of the cement. Properly slaked and aged lime putty may be used instead of hydrated lime.

Swimming Pools—MEDUSA WHITE PORTLAND CEMENT is used for plaster coating the inside of concrete swimming pools on the sidewalls and floors. Also in pouring the entire walls of the tank. Complete specifications will be found in our book *"How to Make Good Waterproofed Concrete,"* A.I.A. File No. 4.

Stucco—Complete specifications for Portland Cement Stucco will be found in our book *"Portland Cement Stucco with Medusa Waterproofed White Portland Cement,"* A.I.A. File No. 21-d-1.

Terrazzo—For complete specifications, see our book "The Beauty of Terrazzo," A.I.A. File No. 22-e-1.

Cast Stone—MEDUSA WHITE PORTLAND CEMENT (Plain or Waterproofed) should be used for facing of cast stone. Complete specifications can be secured from the Cast Stone Institute, Chicago, Ill.

Other Uses—Interior plastering; curbs; white concrete for buildings; sidewalks; steps; art marble; floor tile; runways for airports; highway markers, etc.

Medusa Waterproofed White Portland Cement

This is our regular white portland cement with which MEDUSA WATERPROOFING POWDER is mechanically ground during manufacture, insuring a complete dispersion of the powder and obtaining its maximum waterproofing value. We recommend its use for all work requiring white portland cement.

The use of MEDUSA WATERPROOFED WHITE PORTLAND CEMENT reduces absorption and penetration of water to a negligible degree. In pargeting mortar it will prevent the staining elements in other masonry material from passing into the stone.

The workability is enhanced by the waterproofing content.

Residence Made of Medusa White Portland Cement
ATLEE B. and ROBERT M. AYRES, Architects
JOHN WESTERHOFF, Contractor

MEDUSA PORTLAND CEMENT PAINT

For Concrete, Brick and Masonry

Medusa Portland Cement Paint Covers Exterior of This Home
NAIRNE W. FISHER, Architect JOSEPH SCHELLINGER, Contractor

Description

MEDUSA PORTLAND CEMENT PAINT is a material having as its base MEDUSA WHITE PORTLAND CEMENT specially prepared, with which we have ground chemicals and color pigments of a permanent nature. It contains no oil, glue, lime, casein or other material affected by the chemical action of lime, alkali or water.

Where to Use

MEDUSA PORTLAND CEMENT PAINT is used on concrete, stucco and masonry surfaces including cement block, brick, stone and tile. The presence of dampness in the surface to be painted is an advantage. Unless the surface is damp, it should be wet down before applying the paint. This paint will not bond permanently with non-absorbent surfaces such as enameled brick, vitrified tile, glazed brick or hard burned, non-porous tile. It should not be applied to previously painted masonry without getting special directions. It cannot be applied to lime or gypsum plaster walls or concrete floors except floors of swimming or wading pools. It is widely used for painting interiors of basements, exteriors of concrete, stucco and masonry homes, buildings, smoke stacks, silos, etc.

Swimming Pools

MEDUSA PORTLAND CEMENT PAINT has been extensively used for swimming pools and the success of this work has been demonstrated by the thousands of satisfied customers. Being immune to the effect of water containing the proper amount of chemicals used to keep the pool sanitary, presenting a surface readily cleaned by scrubbing, containing no adulterant that could become the breeding place for germs, this paint is a most satisfactory product for use in swimming pools.

Packages

Shipped in 5-lb., 10 and 50-lb. metal cans and 350-lb. barrels.

Full directions for application will be found in each container.

Covering Capacity

For ordinary smooth masonry surfaces the covering capacity will range from 200 to 350 sq. ft. per 10 lbs. of paint for one coat. Before applying paint to cinder and Haydite blocks, give a wash coat of neat cement.

Colors

See opposite page for colors of MEDUSA PORTLAND CEMENT PAINT.

MEDUSA-LITE, THE SUPER FLAT WALL FINISH

Quick Drying, Economical

MEDUSA-LITE is a casein paint in paste form that gives a truly durable, economical, flat finish painted surface. It can be successfully used on interior walls and ceilings of plaster, brick, concrete, tile, stone, wood, wallboard, insulating board, metal, canvas, etc.

Where to Use

MEDUSA-LITE is used on interior walls and ceilings of residences, stores, theaters, hotels, apartments, hospitals, office and industrial buildings. Owing to its quick drying qualities and the fact that there are no lingering, disagreeable odors, interiors can be painted and ready for occupancy within a few hours. Hotel and apartment owners find this paint ideal because it enables tenants to move in on time. This paint can be used on fresh plaster or concrete without waiting for it to dry. WHITE MEDUSA-LITE is widely used for industrial interiors because of its economy in first cost and application, and because it is unaffected by light, heat, fumes and chemicals.

Advantages

MEDUSA-LITE dries to a permanent, colorful finish and is limeproof. Colors are intermixable, non-fading and are unaffected by light, heat or fumes. White has a 90% and greater reflective value and does not turn yellow.

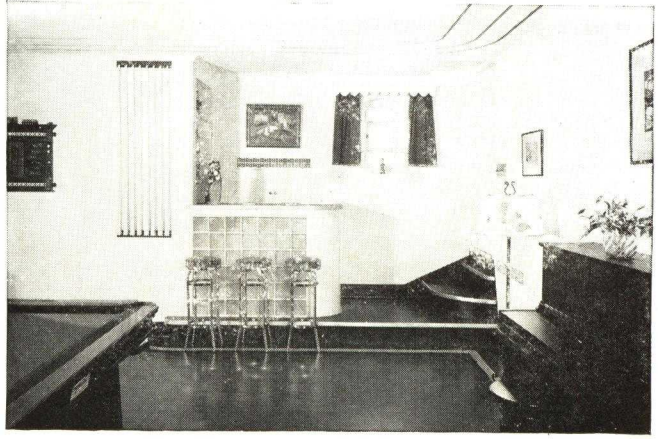
MEDUSA-LITE is economical because one coat generally covers. There are no expensive thinners to buy. Fifty per cent more surface can be painted than with ordinary paints in the same time. It never flakes or checks and stays clean longer. MEDUSA-LITE will not powder, peel or crack. Surface requires no sizing or previous treatment either on old or new walls. It dries to the touch in forty minutes and does not have any disagreeable odors. It is non-inflammable and is unaffected by acid fumes and most chemicals.

Packages

MEDUSA-LITE comes in ¼, 1 and 5-gal. cans.

Colors

See opposite page for MEDUSA-LITE colors.



Recreation Room Painted with Medusa-Lite, the Super Flat Wall Finish

MEDUSA PORTLAND CEMENT PAINT

COLORS

SPANISH BUFF

CREAM

STONE GRAY

PEARL GRAY

GREEN

BLUE

RED
also
BLACK & WHITE

MEDUSA-LITE FLAT WALL FINISH

COLORS

Ivory

Buff

Tan

Gray

Blue

Green

Orchid

Also White

MEDUSA FLOOR COATING—IN THESE COLORS

Light Gray No. 604

Battle Ship Gray No. 605

*Chinese Red No. 305

Brown No. 410

Red No. 303

Also Black and White

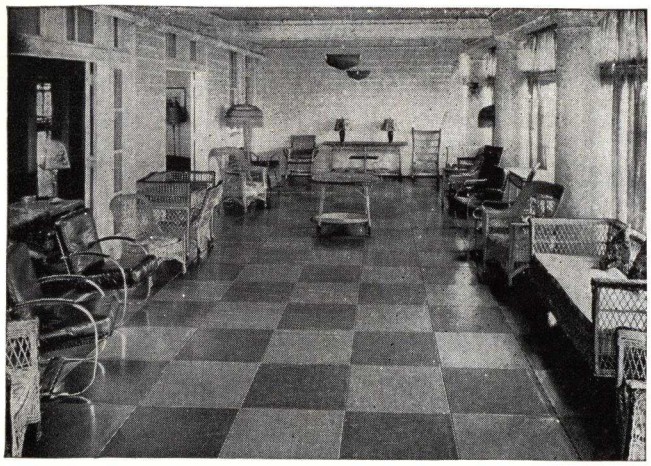
Green No. 205

*When Red or Chinese Red is used, follow with an application of emulsified or paste wax (not liquid) three weeks after final coat. Rewax as necessary.

Inches 1 2 3 4 5 6 7 8
Centimetres 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
TIFFEN® Color Control Patches © The Tiffen Company, 2007
Blue Cyan Green Yellow Red Magenta White 3/Color Black

MEDUSA FLOOR COATING

For Concrete Floors



Medusa Floor Coating Beautifies This Porch in a Country Club

Description

MEDUSA FLOOR COATING overcomes the difficulties usually encountered in painting concrete floors. It makes a colorful finish that is absolutely moistureproof, eliminating surface dusting. The paint is made with a vehicle that is unaffected by alkalies or lime in cement. These alkalies saponify the oils in ordinary coatings and break down the paint film so that the paint comes off in patches, necessitating costly refinishing. MEDUSA FLOOR COATING has an extreme hardness and resists not only ordinary wear, but also the grinding action of dust and dirt.

Where to Use

MEDUSA FLOOR COATING can be used on any porous concrete floor into which water can be absorbed quickly. It is highly recommended for use in auto display rooms, corridors, washrooms and in manufacturing plants where clean, painted concrete floors are essential. This paint eliminates surface dusting. For floors below grade, MEDUSA FLOOR COATING should be applied, if possible, when the heating system is in use, otherwise positive ventilation should be afforded by the use of an electric fan placed on the floor. MEDUSA FLOOR COATING, under ideal conditions, is ready for service in 24 hours after the first coat is applied. Where service is to be severe, wait two or three days.

Colors

MEDUSA FLOOR COATING is furnished in the six colors shown on the preceding page and black and white. These colors are permanent and resist alkaline cleaning or washing compounds.

Packages

Shipped in containers of 1 qt., 1 gal., 5 gal. and 55-gal. drums.

Covering Capacity

On the average troweled floor, the covering capacity for the second or third coats is about 600 sq. ft. per gallon.

MEDUSA STONESET CEMENT

A Non-staining, Waterproofed, Mortar Cement

What It Is

MEDUSA STONESET CEMENT is a non-staining mortar cement which has been waterproofed by the addition of the proper amount of MEDUSA WATERPROOFING mechanically ground in at the mill during the process of manufacture.

It is manufactured from the same raw materials as MEDUSA NON-STAINING WATERPROOFED WHITE PORTLAND CEMENT. These raw materials are free from the elements which cause staining, and waterproofness is assured.

MEDUSA STONESET CEMENT has minimum shrinkage, smooth workability and great plasticity which is so necessary in stone setting mortar.

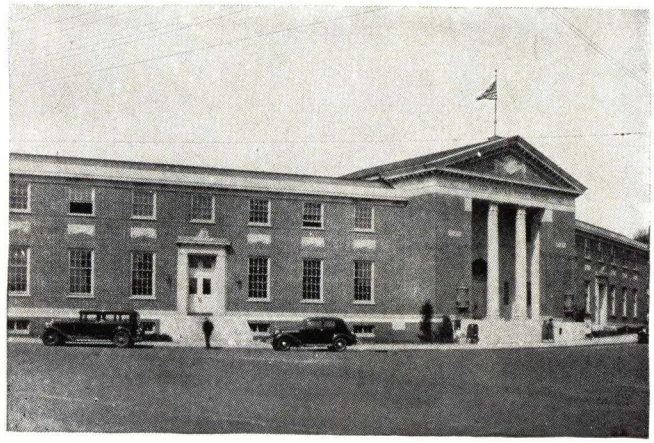
Where to Use

MEDUSA STONESET CEMENT is to be used in mortar for setting, pargeting, and pointing of cut stone, and for laying up face brick. Its low cost also permits its use for mortar in the backup wall as well as for the exterior wall.

The use of one mortar throughout the wall has many advantages from the standpoint of economy and convenience. The use of non-staining, waterproofed mortar throughout the wall provides additional assurance against staining and efflorescence.

We do not recommend MEDUSA STONESET CEMENT for any other use except masonry mortar. MEDUSA PORTLAND CEMENTS, White and Gray (Plain or Waterproofed), should be used for other purposes.

Because of its white color and great plasticity MEDUSA STONESET CEMENT is ideal for laying up face brick. It can be easily tinted to the desired shade.



United States Post Office, Pawtucket, R. I.
JAMES A. WETMORE, Supervising Architect
EDWARD S. MOORE & SON, Contractor
Medusa Stoneset used

Non-staining

A non-staining cement means a cement that will not stain the stone with which it comes in contact. Long and exhaustive tests have proved that MEDUSA STONESET CEMENT is non-staining.

Waterproofed

Authorities agree that it is absolutely necessary that all non-staining mortars be waterproofed to prevent the staining elements in other materials in backup masonry from passing into the stone.

The fact that MEDUSA WATERPROOFING is mechanically ground into MEDUSA STONESET CEMENT during the process of manufacture is assurance that the cement is absolutely waterproofed.

Workability

MEDUSA STONESET CEMENT produces a mortar of great workability and plasticity. Stone setters will find the workability and plasticity of MEDUSA STONESET CEMENT to be of particular advantage in the placing of stone. Its easy spreading qualities make it especially adaptable for pargeting and for use in mortar for the backup wall.

Color

The color of MEDUSA STONESET CEMENT is white, which harmonizes well with all shades of limestone, granite, marble, etc.

Specifications for Mixing

MEDUSA STONESET CEMENT is to be mixed in approximate proportions of 1 part of MEDUSA STONESET CEMENT to 3 parts of sand, by volume. The sand should be well graded, clean, and free from organic matter. To facilitate hand mixing, the sand should be dampened before MEDUSA STONESET CEMENT is added.

No Admixtures Are Necessary

When using MEDUSA STONESET CEMENT no admixtures are necessary to secure waterproofness or plasticity. This fact is extremely important to the architect, contractor and owner.

The contractor is saved the expense and labor of adding admixtures and the architect is assured that the proper amount of waterproofing has been added.

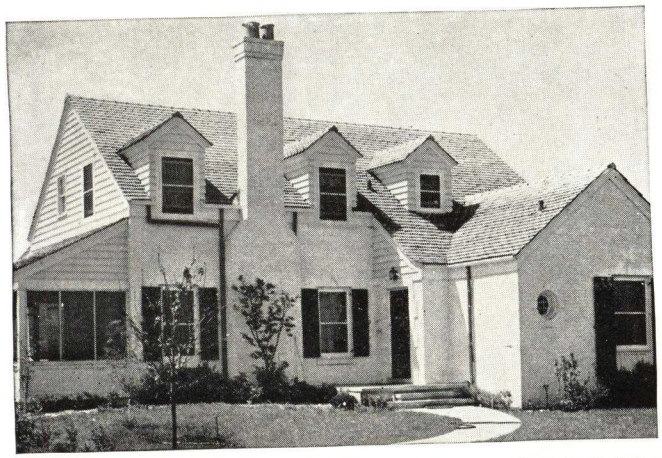
Setting Time

The setting time of MEDUSA STONESET CEMENT is approximately:

Initial—3 hours 40 minutes. *Final*—7 hours 15 minutes

MEDUSA BRIKSET—MASONRY CEMENT

Waterproofed



Medusa Brikset, the Waterproofed Masonry Cement, Used in Building This Home

L. COSBY BERNARD, Architect
H. B. OLNEY, Contractor

A waterproofed masonry cement with a portland cement base for lay-up brick, concrete units, tile and other masonry units. This cement has minimum shrinkage. MEDUSA BRIKSET provides the essentials of a good masonry mortar—workability, plasticity, waterproofness, strength and durability. Great plasticity and workability are obtained without the addition of lime. Its color is a striking advantage when used with or without mortar colors.

Saves Time

MEDUSA BRIKSET spreads easily and smoothly and permits joints to be struck cleanly and rapidly, eliminating waste from dropping. This feature, coupled with the fact that no hydrated lime is required, effects a considerable saving. It has an *initial* set of approximately 4 to 4½ hours and a *final* set of approximately 6 to 8 hours.

Directions for Use

Mix 1 part of BRIKSET with 3 parts of clean, well-graded masons' sand, and add enough water for the desired consistency.

Four sacks of BRIKSET (66 lbs. gross, each) mixed with sand in 1:3 proportions will make ½ cu. yd. of mortar.

TENSILE AND COMPRESSIVE STRENGTH

1 part Medusa BrikseT, 3 parts standard sand

Days	Pounds per square inch	
	Tensile	Compressive
3	128	633
7	197	1371
28	267	1795

Note: Medusa BRIKSET conforms to the United States Government Master Specifications SS-C-181 covering requirements of a masonry cement, which provides for a compressive strength of not less than 175 lbs. per sq. in. at the age of 7 days, for a 1:3 mortar.

MEDUSA WATERPROOFING FOR CONCRETE AND MORTAR

Powder and Concentrated Paste

Description

All concrete and mortar below grade or exposed to the elements should be waterproofed to give insurance against wet and damp walls and floors, to retard disintegration due to the freezing and thawing of absorbed moisture—and ground acids.

Authorities on waterproofing agree that the most effective way to prevent water absorption in concrete and mortar is to incorporate a water repellent material which breaks down capillary attraction on the surface. This method is most economical and assures the user that the entire mass of concrete or mortar is thoroughly and permanently waterproofed.

MEDUSA WATERPROOFING (Powder or Paste) is the original water repellent waterproofing for concrete and mortar. It has been used for more than 30 years under severe water conditions and always gives satisfaction. It contains a large percentage of stearate. Stearate is recognized as the best waterproofing agent known.

Directions for Use

Powder—Use two lbs. of MEDUSA WATERPROOFING POWDER to each sack of portland cement used. MEDUSA WATERPROOFING POWDER is added dry to the cement and aggregate. Mix dry with cement alone where hand mixing is employed.

Concentrated Paste—One gallon of MEDUSA CONCENTRATED PASTE weighs eight lbs.—enough to properly waterproof thirteen sacks of cement. We recommend 1 gal. (8 lbs.) of Concentrated Paste be dissolved in 12 gal. of water at 60° F. or above. Add 1 gal. of this waterproofing paste solution for each sack of cement when mixing the concrete or mortar.

The same waterproofing results are obtained with either Powder or Paste.

The use of MEDUSA WATERPROOFING is recommended only in territories where MEDUSA WATERPROOFED GRAY PORTLAND CEMENT or MEDUSA WATERPROOFED WHITE PORTLAND CEMENT is not obtainable. MEDUSA WATERPROOFED CEMENTS—Gray and White—are our regular portland cements with which the correct amount of MEDUSA WATERPROOFING is mechanically ground during the process of manufacture, insuring a complete dispersion and obtaining the maximum waterproofing value.

The use of MEDUSA WATERPROOFED CEMENTS eliminates the use of admixtures on the job and the expense of supervision to insure that the correct amount of waterproofing has been added.

Specific Uses

MEDUSA WATERPROOFING should be used in all concrete and mortar below grade when exposed to the elements or moisture. A few specific uses are:

Mortar	Cast Stone	Storage Silos
Swimming Pools	Concrete Products	Tunnels
Basement Walls	Shower Baths	Subways
Basement Floors	Terrazzo	Dairy Barns
Retaining Walls	Stucco	Dairy Plants
Plaster Coats	Elevator Pits	Burial Vaults

Waterproofed Mortar

The use of MEDUSA WATERPROOFING in portland cement mortar will tend to prevent the subsequent discoloration and unsightly appearance of brickwork caused by efflorescence which may be attributed to the mortar.

The use of MEDUSA WATERPROOFED MORTAR prevents the absorption of moisture through the joints. Unless the mortar is waterproofed, it is possible that such a quantity of water will be absorbed as to cause considerable inconvenience and damage.

MEDUSA WATERPROOFED CEMENTS and WATERPROOFING POWDER or CONCENTRATED PASTE have proved successful for 30 years.

Packages

MEDUSA WATERPROOFING POWDER is shipped in 40-lb. paper bags. MEDUSA CONCENTRATED WATERPROOFING PASTE is shipped in 8-lb. (1 gal.) cans; 40-lb. (5-gal.) cans and 225 and 400-lb. steel drums.

Literature

Our books "How to Make Good Waterproofed Concrete," A.I.A. File No. 4, containing full specifications and "Medusa Waterproofing for Concrete and Mortar" will be mailed free upon request.

RIVERTON LIME AND STONE COMPANY, INC.

Hydraulic Lime for Concrete, Masonry Mortar and Stucco

MAIN OFFICE, QUARRIES AND KILNS

RIVERTON, VIRGINIA

Stocked by Building Material Dealers—Nearest Dealer's Name Furnished on Request

FLAMINGO HYDRO-HYDRAULIC LIME PRODUCTS

(Copyrighted)

"FLAMINGO" is the trade name applied to the easy-working, water-proofing and quick hardening *Hydraulic* Hydrated Lime produced by the RIVERTON LIME AND STONE COMPANY, INC. at Riverton, Virginia. FLAMINGO *Hydraulic* Hydrated Lime is manufactured from *hydraulic* limestone from their own quarries, and is in accordance with the A. S. T. M. (American Society for Testing Materials) specifications for hydraulic hydrated lime, designation C-141-38T.

FLAMINGO must not be confused with ordinary hydrated lime, for while it has similar plasticity and fineness of grain, FLAMINGO, like portland cement, will set, harden and gain early as well as ultimate strength even while under water, whereas ordinary hydrated lime lacks these important qualities.

For this reason, FLAMINGO is especially adapted for use below as well as above grade.

Sixty-eight years' experience in burning lime, and many years of research and investigation in the development of *Hydraulic* Hydrated lime, stand behind the manufacturers of FLAMINGO products and their guarantee.

Hydraulic Lime is not a new product. It has been, and is being used in concrete and for masonry mortar in all types of buildings in England and Europe. Buildings erected hundreds of years ago with hydraulic lime in mortar and concrete demonstrate its permanence, waterproofness and ability to resist the ravages of time.

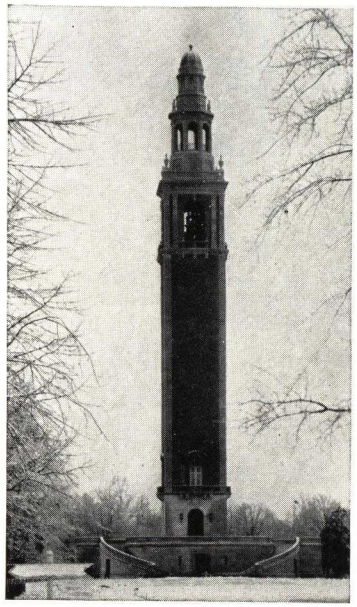
The *Hydraulic* Hydrated Lime products are Waterproofed FLAMINGO for Masonry Mortar, FLAMINGO for Concrete and FLAMINGO for Stucco and Interior Plastering.

WATERPROOFED FLAMINGO FOR MASONRY MORTAR

Will meet the United States Government "Master Specifications for Masonry Cement" Number 443, Circular, Bureau of Standards Number 321, and amendments and replacements, including "Federal Specifications for Masonry Cement" SS-C-181 and SS-C-181b.

Prevents Leaky Walls and Dampness

The use of FLAMINGO does away with water seepage through the mortar joints, and puts an end to dampness on the inside walls. Modern research has demonstrated that, assuming good workmanship, leaky walls are due either to lack of proper bond or to cracks or fissures in the mortar itself, sometimes left when brick is laid in harsh, stiff working mortar, and often due to the expansion and contraction of the cementing material used in the mortar, after it has set. FLAMINGO is ground and milled so fine, and the mortar is so plastic and spreads so smoothly, that it sinks into the pores and adheres everywhere to the surface of the brick and fills every crevice in the joint, thus making so perfect a bond that water seepage between the brick and the mortar is wholly eliminated. *Furthermore (due to its composition), Flamingo is not subject to the extremes of contraction and expansion after it has set, which often result in cracks and fissures found in many mortars.* FLAMINGO for Masonry Mortar contains a carefully proportioned amount of a standard waterproofing, which is ground in and further improves its waterproofing qualities. FLAMINGO mortar is watertight, and is for use below as well as above grade.



Virginia War Memorial Carillon, Richmond, Va.

CARNEAL, JOHNSTON & WRIGHT, Architects

DOYLE & RUSSELL, General Contractors

This building is the tallest wall-bearing masonry structure in Virginia. The brick was laid in water repellant Flamingo Masonry Mortar and the concrete base was strengthened and made watertight by the addition of Flamingo for concrete

Colored Flamingo

Standard mineral mortar colors may be added to FLAMINGO mortar if guaranteed for use with cement and lime mortar by the manufacturers. As a special service to architects, Colored FLAMINGO for Masonry Mortar can be supplied in practically any desired color. A box of mortar samples, showing a representative range of 17 different colors, will be sent to any architect or contractor on request. Samples of old mortar will be matched.

In the manufacture of Colored FLAMINGO, high grade mineral oxide pigments are used and thoroughly mixed under careful laboratory supervision to give evenness of tone. Permanent records are kept to insure exact reproduction at any later time. Colored FLAMINGO is not kept in stock but is made on special order.

Flamingo for Stucco

FLAMINGO makes a stucco that is beautiful in color and texture, plastic, permanent, economical and waterproof.

For scratch coat on metal lath use 2 cu. ft. of sand to each bag of Waterproofed Flamingo for Masonry Mortar and add a generous quantity of plasterer's fiber or hair. If desired, FLAMINGO can be furnished with the fiber added. For all other coats and on masonry or concrete, use 3 cu. ft. of sand to each bag of FLAMINGO.

Mixing for Masonry Mortar

The standard mix is 1 FLAMINGO to 3 sand, by volume; or 1 bag FLAMINGO to 3 cu. ft. of sand. Mix the sand and FLAMINGO thoroughly, add water and complete the mixing. The mortar is ready for use immediately.

Strength

FLAMINGO mortar meets not only the standard building code strength requirements for the heaviest load-bearing walls, but those prescribed by the Bureau of Standards and the United States Government for the masonry cement used in Government buildings.

FLAMINGO mortar takes its initial set in from 2½ to 3½ hours, and its final set in from 6 to 8 hours, progressively increasing in strength until it is as hard as the brick itself.

Uniformity of Strength and Color

The architect and builder may be sure that uniformly sanded FLAMINGO mortar will be notably and consistently light in color and uniform in strength at all times, and under all conditions. The natural color of FLAMINGO mortar approximates that of straight lime mortar, modified and softened by the light cream tint of the neat FLAMINGO.

How Packed

FLAMINGO is packed in 62½-lb. multiwall paper bags, containing 1 cu. ft. (plus) of material. Four bags to the barrel of 4 cu. ft. (plus) weighing 250 lbs.

Typical Flamingo Jobs

FLAMINGO is approved and has been used on projects of the U. S. Treasury, Veterans' Bureau, War Department, Department of the Interior, etc. Large numbers of schools, hospitals and private buildings prove the high quality of Waterproofed FLAMINGO for Masonry Mortar.

Lists of projects on which FLAMINGO has been used, with the names of the architects and builders, will be furnished.

FLAMINGO HYDRO-HYDRAULIC LIME FOR BETTER CONCRETE

FLAMINGO for Concrete is chiefly a di-calcium silicate, and increases the strength, density and watertightness of concrete when used as an addition to the usual mix of portland cement, sand and gravel. When used in blended concrete as a substitution for a portion of the portland cement, it maintains the strength and gives an improved concrete with all the advantages stated below. It is easy to handle, economical in price, reduces the cost of concrete and satisfies the owner, architect, engineer and contractor.

Important

FLAMINGO *Hydro-Hydraulic Lime for Concrete is guaranteed to meet A. S. T. M. Specifications C-141-38T for Type A Hydraulic Hydrated Lime for Structural Purposes. These specifications state "Hydraulic Hydrated Lime may be used . . . as sole cementitious material in concrete, or in portland cement concrete either as blend, amendment, or admixture."*

An Improved Blended Concrete

When used to replace portland cement in the mix in the proportions recommended, FLAMINGO Hydro-Hydraulic Lime gives improved workability, greater density, less shrinkage and cracking, increased toughness and resistance to wear, and great resistance to the disintegrative effects of freezing and thawing with *no reduction in strength.* It assures a durable, uniform low-shrinkage and form-fitting concrete with perfect contact, bond and protection for the reinforcing; lending itself to elaborate and difficult forming with a harder, smoother finish to the concrete. It gives the concrete a vastly improved appearance. Forms can be removed earlier, and the smoothness of the concrete after they are removed is such that the cost of finishing is reduced.

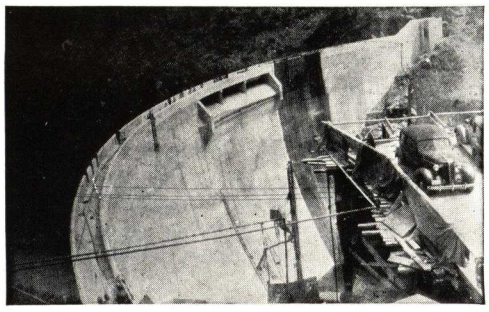
Watertight Concrete

FLAMINGO for Concrete is a most economical waterproofing material for use in all forms of plain or reinforced concrete where watertightness is essential. Due to its extreme fineness and lubricating qualities, FLAMINGO makes a denser and closer textured concrete by decreasing voids, preventing segregation of the components and reduction of honeycombing, stone pockets and bridging. Unlike many waterproofing compounds, FLAMINGO is not an inert material but is an active strength producing agent. The use of FLAMINGO also gives the concrete a smoother, harder surface which is highly resistant to the action of frost, acids and sea water.

Where Used

FLAMINGO for Concrete has been successfully used in the concrete for dams, piers, bridges, viaducts, retaining walls, building foundations, swimming pools, hurricane gates, engine foundations, floors, walks, driveways, etc.

A list of projects in your vicinity and tests by independent Testing Laboratories will be sent on request.



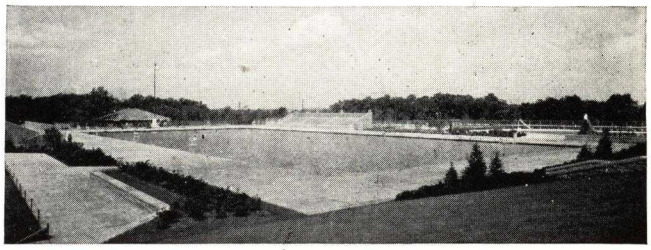
Talbot Storage Dam-Pinnacles of Dan Hydro-Electric Development

CHAS. T. MAIN, INC., Boston, Mass., Engineers
LIGON & LIGON, Baltimore, Md., Contractors

Over 5000 lbs. 28-day compressive strength obtained using 1 sack (1 cu. ft.) Flamingo for concrete and 5 sacks of portland cement per yard of concrete

RECOMMENDED MIXES FOR BLENDED CONCRETE

Compressive strength desired, lbs. per sq. in. (28 days)	Portland cement, bags	Flamingo for concrete, lbs.	Sand, cu. ft.	Stone or gravel, cu. ft.	Water in gals. per sack of Portland cement
A rich mixture of 1:2:4 concrete for reinforced machine foundations subject to vibrations; and reinforced floors, beams and columns for heavy loading and one course walks and driveways.					
3000 to 4000	1	15½	2.4	4.8	6½ to 7
A medium mixture of 1:2½:5 concrete for ordinary machine foundations, thin foundation walls, building walls, arches, and base of two course walks, floors and driveways.					
2000 to 3000	1	20	3	6	8 to 9
An ordinary mixture of 1:3:6 concrete for mass foundations, footings, heavy walls, retaining walls, piers and abutments.					
1000 to 2000	1	25	3.75	7.5	10 to 11



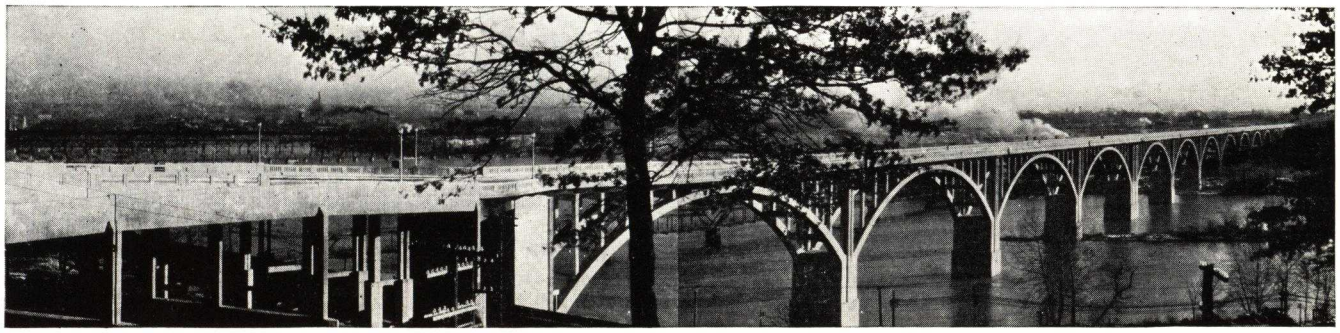
North Park Swimming Pool for Allegheny County, Pennsylvania

KARL B. WEBER, Pittsburgh, Pa., Supervising Architect
JOHN CARSON & SON, Pittsburgh, Pa., General Contractors

The beautiful and watertight concrete of this pool was obtained by using 1 sack Flamingo for concrete and 5½ sacks of portland cement per yard of concrete

RECOMMENDED MIXES FOR WATERTIGHT CONCRETE

Compressive strength desired, lbs. per sq. in. (28 days)	Portland cement, bags	Flamingo for concrete, lbs.	Sand, cu. ft.	Stone or gravel, cu. ft.	Water, gals.
A rich watertight mixture of 1:2:4 concrete for watertight basements, reservoirs, tanks, swimming pools, floor slabs, roofs and all classes of watertight work. Strongly recommended as giving the best watertight concrete.					
3000 to 4000	1	11⅓	2	4	6
An economical watertight concrete for use where high strength is unnecessary.					
2000 to 3000	1	31¼ (½ sack)	3	5.2	8 to 9



Robert E. Lee Bridge (over the James River), Richmond, Va. (Flamingo Used in All Concrete)

LEE, SMITH & VAN DERVOORT, Richmond, Va., Architects
S. M. SIESEL COMPANY, Milwaukee Wis., Contractors
ALLEN J. SAVILLE, INC., Richmond, Va., Engineers

SUPERIOR CEMENT CORPORATION

PORTSMOUTH, OHIO

SUPERIOR CEMENTS

Superior Portland Cement; Superior Waterproofed Portland Cement; Superior Colored Portland Cement; Wifco Mortar Cement Plain; Colored Wifco Mortar Cement; Tri-cal High Early Strength Portland Cement.

Superior Portland Cement

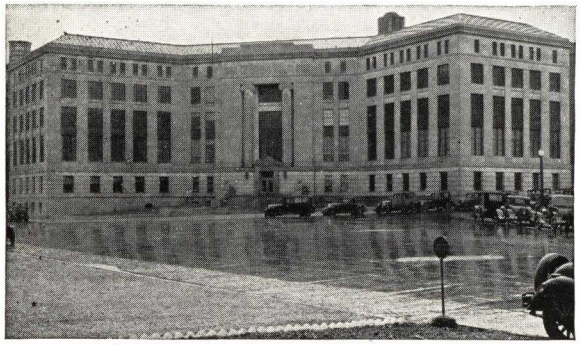
A high quality product meeting all standard specifications and having many years of successful use as a basis for its general acceptance for all kinds of work. It is recognized by the building industry as an outstanding material because of its exceptionally high strength, uniformity and plasticity—these items contributing to better and easier handled concrete.

Superior Low Heat Portland Cement

A cement developed to meet the U. S. Government specifications for low heat cement for use in heavy concrete masonry work, has been used on several major projects and been very successful.

Superior Waterproofed Portland Cement

Another successful Superior product embodying the same high qualities as regular Superior Portland Cement, and adapting itself to those uses demanding this type of material.



Wifco Mortar Cement Used on Central Police Station, Columbus, Ohio
Allied Architects Association of Columbus, Architects
Boyajohn & Barr, Inc., General Contractors

Wifco Mortar Cement

Wifco which is waterproofed and non-staining, has all the valuable strength characteristics of portland cement together with the plasticity demanded by the mason. It is ground to uniform fineness and produces uniformly high strength. Due to this combination of high strength and excellent plasticity, Wifco may be selected with confidence for load-bearing walls. It has been in successful use for over ten years and has established a reputation for excellence throughout the building field.

Wifco Mortar Cement is a quality product in every respect and its economy will be reflected not only in the cost of the material itself, but in the excellent workability which it produces, insuring better workmanship and lower labor costs.

Wifco Specifications and Tests

Economy—Repeated tests indicate that 800 to 1000 bricks are laid with the mortar from four sacks of Wifco.

Compression Strength—Strength in pounds per square inch based on a 1:3 mix by weight, using standard sand; 7 days 883 lbs., 28 days—1870 lbs.

Setting Time—*Initial Set:* 3 hours, 30 minutes. *Final Set:* 10 hours, 5 minutes.

Fineness—93% passing 200-mesh screen.

Non-staining—Wifco is classified as a non-staining cement, for all general uses.

Waterproofed—Keeps water from entering the joint; thus makes for durability and dry wall construction.

Packages—Wifco is packed in multiwall paper bags, holding 74 lbs. net weight—approximately 1 cu. ft.

Specifications—Mix one part of Wifco Mortar Cement with three parts (by volume) of clean, well graded mortar sand which is free of any organic material. Add sufficient water for proper consistency.

BEAUTY AND DURABILITY WITH COLOR

Concrete made with Superior Colored Portland Cement gives new charm to pools, walks, drives, terraces, steps and other home and business improvements by adding beauty to permanent construction. Colored Wifco Mortar Cement enables a distinctive touch to be given to masonry work, making each job individual, and combines beauty with proven Wifco durability.

Superior Colored Portland Cement—Produced in our own mill. The highest quality mineral oxides obtainable are thoroughly ground into the cement under laboratory supervision in uniform quantities so that the resulting color may be reproduced at any time, and that the concrete made from it will be permanently strong as well as beautiful. It is regularly made in the following colors: Red, Blue, Green, Black, Yellow, Brown.

Colored Wifco Mortar Cement—Also manufactured under close laboratory control. Carefully measured quantities of standard mortar colors completely ground into Wifco Mortar Cement, and the entire process of manufacture, enables duplication of results at future times, and prevents loss of strength—assuring durable construction and lasting color. It is regularly made in the following colors: Red, Black, Chocolate Brown, Buff, Light Buff, Green.

Tri-Cal High Early Strength Portland Cement

Tri-Cal, a rapid hardening portland cement, conforming to the tentative specifications for High Early Strength Portland Cement (C74-30T) is manufactured under the most careful and scientific control to insure absolute uniformity. It is a true portland cement containing no admixture or adulteration. It is ground to a high degree of fineness and produces dense impermeable concrete of exceptionally high strength at the early ages and better concrete at all ages. It has a high content of tri-calcium silicate which is the influencing factor in its rapid hardening characteristics.

TYPICAL PHYSICAL ANALYSIS

Initial Set Hrs.	*Final Set Hrs.*	*Fineness Passing 200 M*
1:45	3.25	98.

Tensile Strength
(Lbs. per Sq. In.—1:3 Sand Mortar Briquettes)

1-Day	*3-Day*	*7-Day*	*28-Day*
315	413	489	550

Concrete

Real Mix	*Approx. Field Mix*	*Cement Sacks Cu. Yd.*	*Water Gals. per Sack*	*Slump*
1:4.3	1:2¼:2¾	5.3	6	3 in.

Compressive Strength
(Lbs. per Sq. In.—6x12-in. Cylinders)

1-Day	*3-Day*	*7-Day*	*28-Day*
2008	3320	4597	4910

UNITED STATES GYPSUM COMPANY

300 West Adams Street, CHICAGO, ILL.

For Sales Offices, see File Index for USG Catalog on Roof, Floor and Partition Products

MASON'S LIME

Use

As a mortar for setting brick, stone, etc., and for mixing with Portland cement, concrete, and stucco.

Brands

Mason's Hydrate—

Red Top* Mason's Hydrate (High Calcium and Dolomitic)
Snowdrift* Mason's Hydrate (High Calcium)
Marble Rock Mason's Hydrate (High Calcium)

Mason's Quicklime—

USG* Superfine Mason's Quicklime (High Calcium)
USG Pulverized Mason's Quicklime (Dolomitic)
USG Fine Grain Mason's Quicklime (High Calcium)
USG Pebble Mason's Quicklime (Dolomitic)
USG Crushed Mason's Quicklime (Dolomitic)
Peerless* Pulverized Mason's Quicklime (High Calcium)
Peerless Crushed Mason's Quicklime (High Calcium)
Marble Rock Pulverized Mason's Quicklime (High Calcium)
Marble Rock Pebble Quicklime (High Calcium)
USG Lump Lime (High Calcium and Dolomitic)

Description

The advantages of lime mortar for use in brick, tile, or stone masonry are economy, strength, plasticity, and waterproofing. Either a high calcium or dolomitic lime can be used for masonry.

USG Mason's Hydrated Limes are scientifically slaked by the manufacturer and are ready for mixing and use after soaking.

USG Mason's Quicklimes are thoroughly burned from carefully selected rock and produce a mortar with high plasticity and excellent workability with high sand carrying capacity.

Quicklime must be slaked and aged before using in mortar.

Directions—Hydrated Lime

Hydrating—First pour water into box, then add Hydrated Finishing Lime to the water, distributing it uniformly. The water must cover the lime. Use sufficient water —about 6½ gallons to 50 pounds of hydrate, an amount sufficient for a soft, wet paste.

Soaking—Allow to remain undisturbed for at least 6 hours, preferably over night. Protect from frost and drying up until used. Soaking develops plasticity, and putty should not be allowed to dry after it has reached the correct buttery consistency.

Mixing—Mix putty with sand or with sand and cement, adding sufficient water to bring mix to a hodable consistency.

Directions—Quicklime

Slaking—Add water and lime gradually while mixing, constantly agitating mixture to prevent burning of unslaked portion. Mix to a thin consistency and screen through a quarter-inch mesh screen.

If dolomitic lime is used, the lime must not be hoed or stirred except to level out any hot, dry areas which do not receive water.

Aging—After screening, run mixture into aging box. Lime must be aged until it is cool and the putty is hodable. Lime putty produced from quicklime should never be used until aged at least one week, and a longer time is preferable to assure complete slaking.

Mixing—Mix putty with sand or with sand and cement, adding sufficient water to bring mix to a hodable consistency.

*Registered trade-mark.

Package

Red Top Mason's Hydrate.....50-lb. paper bags
Snowdrift Mason's Hydrate.....40-lb. paper bags
Marble Rock Mason's Hydrate.....50-lb. paper bags
USG Superfine Mason's Quicklime.....80-lb. paper bags
USG Pulverized Mason's Quicklime.....50-lb. paper bags
USG Fine Grain Mason's Quicklime.....80-lb. paper bags
USG Pebble Mason's Quicklime..180-lb. net wood barrels or steel drums
USG Crushed Mason's Quicklime..180-lb. net wood barrels or steel drums
Peerless Pulverized Mason's Quicklime..100-lb. paper bags and 180-lb. net wood barrels or steel drums
Peerless Crushed Mason's Quicklime.....180-lb. net wood barrels or steel drums
Marble Rock Pulverized Mason's Quicklime...60-lb. paper bags, 60-lb. and 90-lb. steel drums
Marble Rock Pebble Mason's Quicklime...100-lb. paper or Calsax bags, 60-lb. and 90-lb. steel drums, 180-lb. net wood barrels
USG Lump Lime is shipped in bulk.
All above brands may be shipped in bulk.

MORTAR MIXES FOR VARIOUS TYPES OF MASONRY

Masonry Type	Type of Construction	Loading	Mortar Proportions (Volume) Lime: Cement: Sand	Remarks
Common and face clay, shale or sand-lime brick	Dwellings, garages and similar construction	Any condition of loading for such types of construction	1 : 0 : 3	
Clay or shale brick	Walls and piers below grade continuously exposed to wet or damp conditions	Ordinary distributed Heavy concentrated Earthquake tremors	1 : 1 : 6* 1 : 1 : 6* 1 : 1 : 6*	
Common and face clay, shale or sand-lime brick	Exterior walls and piers above grade	Ordinary distributed Heavy concentrated Earthquake tremors	2 : 1 : 9* 2 : 1 : 9* 2 : 1 : 9*	2:1:5 Mortar domestic and power plant chimneys
Granite, limestone, marble, sandstone, terra cotta facing and trim	Exterior walls and piers above grade	Ordinary distributed Heavy concentrated Earthquake tremors	2 : 1 : 9* 2 : 1 : 9* 2 : 1 : 9*	Use non-staining portland cement and washed sand
Common and face clay, shale or sand-lime brick, concrete brick	Interior walls and piers above and below grade	Ordinary distributed Heavy concentrated Earthquake tremors	2 : 1 : 9* 2 : 1 : 9* 2 : 1 : 9*	
Hollow clay tile, concrete block, concrete tile, cinder block	Exterior walls above grade and interior partition walls	Non-bearing partitions, exterior and bearing walls and partitions	2 : 1 : 9* 2 : 1 : 9* 2 : 1 : 9*	

Notes: Materials to conform to current "A.S.T.M. Standard Specifications".

Mortar containing portland cement to be used within one hour after mixing.

*One volume of cement is the maximum quantity which should be used. The sand content is to be varied in accordance with its quality in the particular market involved and its proportion may be reduced if greater mortar strength is desired.

From "Masonry Mortar, Bulletin 321" published by National Lime Association.

CLINTON METALLIC PAINT COMPANY

Mortar Colors, Cement Colors, Protective Paints and Roofing Cement

100 Clinton Road, CLINTON, N. Y.

NEW YORK OFFICE: 84 William Street—Telephone, Beekman 3-4091

Products

Manufacturers of CLINTON MORTAR COLORS and CLINTON CEMENT COLORS.

Also manufacturers of the following Clinton Specialties:
Clinton Silk Fibre Elastic Slaters Roof Cement.
Clinton Asbestos Furnace and Retort Cement.
Metallic and Venetian Roof and Barn Paints.
Clinton Hermetic-Seal Liquid Roof Cement.
Clinton High Temperature Fire Brick Cement.
Send for descriptive literature and prices.

Experience

Ever since 1887, the CLINTON METALLIC PAINT COMPANY has served the architectural profession and the bulding trade. Over 50 years of scientific research and manufacturing experience are reflected in the uniform excellence of Clinton products.

Permanent and Uniform

Clinton Mortar Colors are mineral colors, as permanent as the colors in natural rock. Rigid laboratory tests keep them absolutely uniform from shipment to shipment and from year to year. They are free from any form of adulterant.

Directions for Estimating and Using CLINTON Mortar Colors

To get a mortar joint of intense color it is advisable to use approximately 100 lbs. of dry mortar color per 1000 brick laid in running or common bond, with half-inch mortar joints. If mortar joints are wider or narrower, or if a bond requiring more or less mortar per 1000 brick is used, the amount of mortar color required per 1000 brick should be increased or decreased proportionately. Following are two formulas for mortar of deep intense color:

CEMENT MORTAR

Clinton Mortar Color (dry)	25 lbs.
Portland cement	1 bag (1 cu. ft.)
Sand	3 cu. ft.
Hydrated lime	$\frac{1}{10}$ sack

The above is sufficient to lay approximately 250 brick in running or common bond with half-inch mortar joints.

CEMENT LIME MORTAR

Clinton Mortar Color (dry)	30 lbs.
Portland cement	1 bucket (16 qts.)
Hydrated lime	1 bucket (16 qts.)
Sand	6 buckets (96 quarts)

The second formula is sufficient to lay approximately 300 brick in running or common bond with half-inch mortar joints.

As it is not always convenient to weigh color on the job, we tabulate below various shades of Clinton Mortar Color, showing the number of quarts of dry Clinton Mortar Color *(struck measure)* which are equivalent to 25 and 30 lbs.

Caution: This table applies only to genuine Clinton Mortar Colors

	Number of quarts	
	Equivalent to 25 lbs.	Equivalent to 30 lbs.
Clinton Hermatite Red No. 10	10	12
Clinton Mortar Brown No. 400	8½	10½
Clinton D. S. Chocolate No. 402	9	11
Clinton Special Chocolate No. 404	9	11
Clinton Colonial Buff No. 700	19	23
Clinton Pompeiian Buff No. 600	19	23
Clinton Dark Buff No. 717	16½	20
Clinton Mortar Black No. 900	18½	22½
Clinton D. S. Black No. 800	19	23
Clinton D. S. Olive Green No. 1503	17½	21

Pearl Gray Mortar may be produced by using one-eighth as much Clinton Double Strength Black No. 800 as is recommended above to produce intense black mortar.

Clinton Mortar Black No. 900 or Single Strength Black, as it is sometimes called, will not give a jet black mortar. For best results use Cuinton Double Strength Black No. 800.

For Cream Colored Mortar a cement lime mortar or a cement mortar made with white cement and sand should be used, adding about half as much Clinton Colonial Buff No. 700 or Dark Buff No. 717 as recommended above.

Many contractors get good results with smaller proportions of Clinton Mortar Colors than those above recommended. This is possible if coarse sand is used and all ingredients are mixed, remixed, then mixed again. Experience, however, proves that the amounts of color recommended will give good results under all conditions.

Money spent for a little extra color more than pays for itself in power and wages saved at the mixer, and in the owner's satisfaction with the finished job.

CLINTON Pulp Colors

Many users of mortar colors desire the colors in pulp form. Clinton Pulp Colors are of the same high quality as Clinton Dry Colors. Further detailed information with prices will be furnished upon request.

Directions for Estimating and Using CLINTON Cement Colors

The suggestions given below apply only to Clinton Colors mentioned.

The user is cautioned against applying them to other colors.

The amount of Clinton Cement Colors given in the following table produces concrete of intense color tone. The full value of the color used is only obtained by thorough mixing. Careless mixing not only wastes the color, but also may result in spots and streaks in the concrete produced. Each batch should be mixed an equal length of time.

For convenience in estimating and for use when color is weighed on the job, the approximate weight of the volume of color recommended is given. This based on measure filled full and struck off without shaking down or otherwise packing it.

Clinton Color	Tone produced	Volume color per bag cement	Max. weight color per bag cement
No. 92 Red	Red	7 qts.	18 lbs.
No. 82 Red	Deep Intense Red	7 qts.	6¾ lbs.
No. 61 and 64 Red	Bright Intense Red	7 qts.	14¾ lbs.
No. 1150 Brown	Deep Brown	7 qts.	10½ lbs.
No. 714 Yellow	Bright Yellow	7 qts.	7 lbs.
No. 715 and 723 Yellow	Yellow	7 qts.	7 lbs.
No. 1502 Green	Deep Green	7 qts.	14¾ lbs.
No. 1603 Blue	Deep Intense Blue	7 qts.	8¾ lbs.
No. 909 Black	Deep Black	7 qts.	10½ lbs.
Cem-Black	Deep Black (Paste)		6 lbs.

One bag cement and 2 cu. ft. sand yield about 2½ cu. ft. concrete.

We welcome comparison of color effects produced with our products against all other mineral colors sold at equal prices and used weight for weight against Clinton.

Specification

All coloring material to be manufactured by CLINTON METALLIC PAINT COMPANY, Clinton, N. Y., to be delivered on the job in original packages bearing their labels, and to be used according to directions which they will furnish.

ESTABLISHED 1892

THE ATLAS MINERAL PRODUCTS COMPANY

OF PENNSYLVANIA

"The House of Jointing Materials"

MERTZTOWN, PA.

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CANADA: McRae Engineering Equipment Ltd., TORONTO, ONT.

ACID PROOF MATERIALS FOR ALL TYPES OF CONSTRUCTION

Floors—acid, water and oil proof for dairies, meat and food packing plants, citrus fruit plants, bakeries, chemical plants, tanneries, fertilizer plants, acid plants, etc.

Acid Proof Tanks—chemical equipment, acid towers, absorption towers, chimneys for acid gases, fume ducts, etc.

Acid Proof sewers, drains, manholes, foundations.

Jointing of—cast iron pipe, terra cotta pipe, concrete pipe.

FLOORS

Use KOREZ or Tegul-TILESET Acid Proof Cements to join acid proof tile in the construction of acid proof floors. These cements have the following properties:

(1) They are inert to acids regardless of concentration.

(2) They are unaffected by washing with hot water or by abrasion.

(3) They have less than one per cent absorption. (A.S.T.M.)

(4) Adhesion to tile—200 lbs. per sq. in.

(5) Tensile strength—600 lbs. per sq. in.

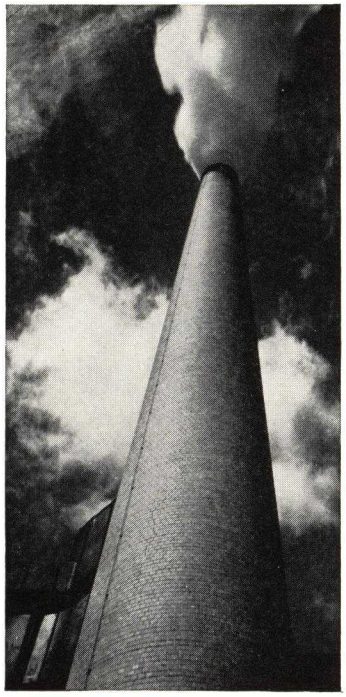
KOREZ is a resin base (bakelite type) cement and is applied cold as a mortar.

Tegul-TILESET is a plasticised sulphur base cement which is melted and poured into the joints.

TANKS—ACID PROOF

Use acid proof brick joined with either VITROBOND, KOREZ, or VITREX, depending upon conditions of operation.

For hydrofluoric acid service use carbon brick joined with Carbo-VITROBOND.



Acid Proof Stack for Acid Gases

SEWERS, DRAINS, MANHOLES, FOUNDATIONS

Use VITROBOND acid and waterproof cement to join acid proof brick in the construction of sewers, manholes, or foundations which are subjected to acids regardless of concentration.

VITROBOND is also used for the jointing of liner plates in the lining of precast concrete pipe.

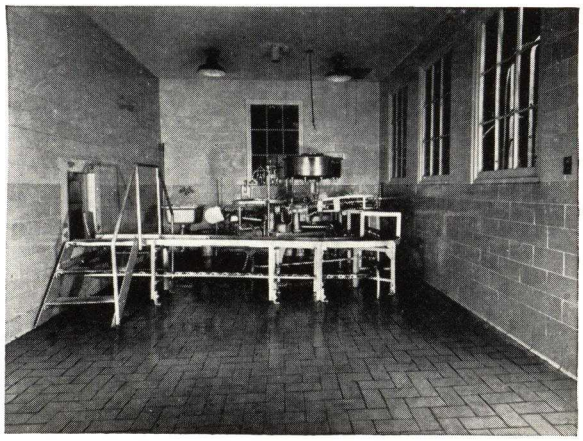
CHIMNEYS AND FUME DUCTS FOR CONVEYING ACID GASES

For these, use VITREX quick setting silicate acid proof cement for acid gases up to 1600° F.

JOINTING CAST IRON, TERRA COTTA AND CONCRETE PIPE

Use Tegul-MINERALEAD for jointing of cast iron pipe—one fifth cost of lead and has greater resistance to vibration—no caulking.

For terra cotta or concrete pipe, use either G-K bituminous cement or Tegul-AMPCO sulphur base cement—root proof, permanent.

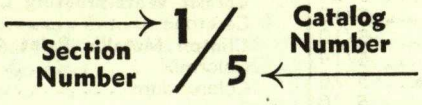


Acid Proof Floor in Dairy—Permanent, Perfect Sanitation

Acid Proof Tank in a Chemical Plant

MEMORANDA

WATERPROOFING
- SECTION - 5



CATALOGS 1 to 27

MANUFACTURERS

THIS INDEX INCLUDES ONLY MANUFACTURERS WHOSE CATALOGS ARE FILED IN THIS SECTION

Adensite Co., Inc. 5/1
Anti-Hydro Waterproofing Co. 5/2
Aquabar Waterproofing Products, Inc. 5/3
Billings-Chapin Co. 5/8a
Brisk Waterproofing Co. 5/4
Cabot, Samuel, Inc. 5/5
Calbar Paint & Varnish Co. 5/6
Ceresit Waterproofing Corp. 5/7
Elaterite Paint & Mfg. Co. 5/8
Hetson-Sommers Co., Inc. 5/9
Horn, A. C., Co. 5/10
Hydrolithic Waterproofing Co., Inc. 5/11
Kuhls, H. B. Fred 5/12
Lastik Products Co., Inc. 5/14
Lewis Asphalt Engineering Corp. 5/13
Master Builders Co. 5/15
Minwax Co. 5/16
Sika Inc. 5/17
Sonneborn, L., Sons, Inc. 5/18
Standard Dry Wall Products, Inc. 5/20
Standard Waterproofing Corp. 5/19
Structural Waterproofing, Inc. 5/21
Toch Brothers Inc. 5/22
Tremco Mfg. Co. 5/23
Truscon Laboratories 5/24
Vortex Mfg. Co. 5/25
Webster, W. F., Cement Co. 5/26
Western Waterproofing Cos. 5/27

PRODUCTS

THIS INDEX INCLUDES ADDITIONAL INFORMATION WHICH IS FILED IN OTHER SECTIONS

Products described or illustrated in manufacturers' catalogs are indexed by section and catalog numbers. All names are listed alphabetically under each product heading.

ACCELERATORS

Cement, Concrete or Mortar

Accello 5/2
Anti-Hydro Waterproofing Co. .. 5/2
Aquabar Waterproofing Products, Inc. 5/3
Aquatite 5/3
B-T 11/13
Ceresit Waterproofing Corp. 5/7
Crescrete 5/7
Dehydratine 5/10
Fastite 9/15
Hetson-Sommers Co., Inc. 5/9
Horn, A. C., Co. 5/10
Kelley 9/15
Maximent Co. 11/13
Quick-Set 5/3
Sika Inc. 5/17
Sonneborn, L., Sons, Inc. 5/18
Speedpatch 5/9
Tomkins, Calvin, Co. 9/15
Trimix 5/18
Specifications 5/10

ACID

Proofing

See Waterproofing—Paint and Compounds; Hardeners and Densifiers

ADMIXTURE

See Specific Type, as; Hardeners and Densifiers; Waterproofing; Antifreeze Compounds

ANTIFREEZE COMPOUNDS

Concrete and Mortar

Accello 5/2
Antifreze 5/9
Anti-Hydro Waterproofing Co. .. 5/2
Aquabar Waterproofing Products, Inc. 5/3
B-T 11/13
Dehydratine 5/10
Fastite 9/15
Hetson-Sommers Co., Inc. 5/9
Horn, A. C., Co. 5/10
Kelley 9/15
Master Builders Co. 5/15
Maximent Co. 11/13
No-Freeze 5/10
Quick Set 5/3
Sika Inc. 5/17
Tomkins, Calvins, Co. 9/15
Specifications 5/10

ASPHALT

Emulsion—Cold Application

Anti-Hydro Waterproofing Co. .. 5/2
Aquabar Waterproofing Products, Inc. 5/3
Barber Asphalt Co., Inc. 6/1
Bondkote 18/14
Carey, Philip, Co. 10/48
Chromate 17/9
Corinco 10/45
Cork Import Corp. 10/44
Cork Insulation Co., Inc. 10/45
du Pont de Nemours, E. I., & Co., Inc. 17/9
(Continued in Next Column)

ASPHALT—Cont.

Emulsion—Cold Application—Cont.

(Continued from Previous Column)

Emulmastic 6/1
Flintkote Co. 6/13
Genasco 6/1
Hako 11/49
Hydrocal 3/29
Hydrocide 5/18
Karnak 5/13
Lewis Asphalt Engineering Corp. 5/13
Merkin, M. J., Paint Co., Inc. 17/19
Minwax Co., Inc. 5/16
Pecora Paint Co., Inc. 18/14
Selbakote 11/46
Selby, Battersby & Co. 11/46
Sonneborn, L., Sons, Inc. 5/18
Stonewall 10/44
Thermotex 10/48
United States Gypsum Co. 3/29
USG 3/29
Webster, W. F., Cement Co. 5/26
Webtex 5/26
Western Waterproofing Cos. 5/27
See also 5/21
Specifications 6/1; 10/45; 17/9

Hot Application

See Asphalt—Basic 6

Waterproofing

See Waterproofing—Paint and Compounds

BACKING

Stone

See Waterproofing; Dampproofing

BONDING COMPOUNDS

Concrete

Adensite Co., Inc. 5/1
Anti-Hydro Waterproofing Co. ... 5/2
Aquabar Waterproofing Products, Inc. 5/3
Asphalcrete 11/52
Bonding Iron 5/15
Bondo 3/33
Ceresit Waterproofing Corp. ... 5/7
Dens-tect 5/25
Ironco 5/3
Iso-Vol 5/24
Master Builders Co. 5/15
Metalbond 5/7
Moulding, Thos., Floor Mfg. Co. 11/52
National Naylegrip Co., Inc. 3/33
Par-Lock Plaster Key 5/25
Truscon Laboratories 5/24
Vortex Mfg. Co. 5/25
Webster, W. F., Cement Co. .. 5/26
Webtex 5/26
Specifications 5/15; 5/25

Plaster

See Plaster—Bond

BRICK

Cleaning Compound

Anti-Hydro Waterproofing Co. . 5/2

CALKING

See Caulking

CAULKING

Compounds

Accurate Metal Weather Strip Co. 16/61
Airtite 5/9
Alglas 7/2
American Bar Lock Co., Inc. ... 7/2
Anti-Hydro Waterproofing Co. . 5/2
Aquabar Waterproofing Products, Inc. 5/3
Aquaseal 17/19
Aquatex 5/3
Armstrong Co. 18/13
Breer's 17/17
Calbar Paint & Varnish Co. 5/6
Caulk-O-Seal 5/6
Ceco Steel Products Corp. 15/6
Everseal Mfg. Co., Inc. 17/12
F.W.B. 17/12
Flex-Sicco 5/22
Hetson-Sommers Co., Inc. 5/9
Hetzel Roofing Products Co. ... 6/49
Horn, A. C., Co. 5/10
Karnak 5/13
Kaukit 5/18
Kauxeme 11/46
King, E. & F., Co., Inc. 17/17
Kinglaze 17/17
Kuhls, H. B. Fred 18/16
Lastik Products Co., Inc. 5/14
Lastikalk 5/14
Lewis Asphalt Engineering Corp. 5/13
Master Builders Co. 5/15
Merkin, M. J., Paint Co., Inc. .. 17/19
Minwax Co., Inc. 5/16
Mortite 5/24
Pecora Paint Co., Inc. 18/14
Plastic Products Co. 18/15
Plastoid 18/15
Plastoid Aluminum 18/15
Plasto-Seal 16/72
Protex Weatherstrip Mfg. Co. .. 16/71
R.I.W. 5/22
Reese Metal Weather Strip Co. . 16/72
Sealtite 16/63
Sika Inc. 5/17

(Continued in Next Column)

CAULKING—Cont.

Compounds—Cont.

(Continued from Previous Column)

Sonneborn, L., Sons, Inc. 5/18
Toch Brothers Inc. 5/22
Tremco Mfg. Co. 5/23
Truscon Laboratories 5/24
Vulcatex 5/10
Vulcatex Primer 5/10
Wampum 5/14
Webster, W. F., Cement Co. .. 5/26
Webtex 5/26
Western Waterproofing Cos. 5/27
See also 16/62; 16/69; 16/73; 17/2
Specifications 5/10; 5/14; 5/18; 16/61; 18/14; 18/16

Pipe and Joints

Anti-Hydro Waterproofing Co. . 5/2
Kuhls, H. B. Fred 5/12

Lead Caps for

Minwax Co., Inc. 5/16
Weathercap 5/16
Specifications 5/16

CEMENT

Accelerators

See Accelerators

Bituminous

Medusa Portland Cement Co. 4/49
R.I.W. 5/22
Self Healing Bridge Cement ... 5/22
Toch Brothers Inc. 5/22

Caulking

See Caulking—Compounds

Colors

See Colors—Mortar, Cement and Stucco

Elastic

See Waterproofing—Integral; Caulking—Compounds; Cement—Pointing

Expansion Joint

See Joints — Expansion — Concrete—Cement for

Hardeners

See Hardeners and Densifiers—Cement and Concrete

Masonry—Waterproofed

See Waterproofing—Integral

Pointing

(See also Caulking—Compounds)

Calbar Paint & Varnish Co. 5/6
Caulk-O-Seal 5/6
Hetzel Roofing Products Co. 6/49
Horn, A. C., Co. 5/10
Kuhls, H. B. Fred 5/12
Lastik Products Co., Inc. 5/14
Master Builders Co. 5/15
Medusa Portland Cement Co. .. 4/49
Medusa-StoneseT 4/49
Mortite 5/24
Plastic Products Co. 18/15
Plastoid Aluminum 18/15
R.I.W. 5/22
Toch Brothers Inc. 5/22
Tremco Mfg. Co. 5/23
Truscon Laboratories 5/24
Vulcatex 5/10
Vulcatex Primer 5/10
Webster, W. F., Cement Co. .. 5/26
Webtex 5/26
See also 5/21
Specifications 5/10; 5/12; 5/14

Waterproofing

See Waterproofing—Integral

COLORS

Mortar, Cement, Stucco Plaster, etc.

Adensite Co., Inc. 5/1
Art-Roc 5/24
Bondo Colormix 3/33
Ceresit Waterproofing Corp. 5/7
Ceretone 5/7
Clinton Metallic Paint Co. 4/53
Colormix 5/15
Colorundum 5/10
Driwal 5/8a
Dycrome 5/15
Gold Bond 9/9
Horn, A. C., Co. 5/10
Keramik 5/10
KuroKrome 5/15
Master Builders Co. 5/15
Maximent Co. 11/13
Metalicron 5/15
Mortite 5/24
National Gypsum Co. 9/9
National Naylegrip Co., Inc. 3/33
Omicron Mortarproofing 5/15
Pecora Paint Co., Inc. 18/14
PurTone 5/1
R.I.W. 5/22
Staybrite 5/10
Toch Brothers Inc. 5/22
Truscon Laboratories 5/24
Specifications 4/53; 5/7; 5/10; 18/14

CONCRETE

Accelerators

See Accelerators

Admixtures

See Specific Type as; Hardeners and Densifiers; Waterproofing, Antifreeze, Fillers—Concrete

Antifreeze Compounds

See Antifreeze Compounds

Hardeners

See Hardeners and Densifiers—Cement and Concrete

Waterproofing

See Waterproofing—Integral

CONTRACTORS

Waterproofing and Dampproofing

See Engineers—Waterproofing and Dampproofing; Waterproofing—Contractors

DAMPPROOFING

Coatings—Paints and Compounds

(See also Waterproofing)

Amurseal 5/2
Anti-Hydro Waterproofing Co. . 5/2
Aquabar Waterproofing Products, Inc. 5/3
Aridclear 5/2
Aridtite 5/2
Barber Asphalt Co., Inc. 6/1
Barrett Co. 6/2
Billings-Chapin Co. 5/8a
Billings-Chapin-Driwal 5/8a
Cemcoat 17/45
Cementhide 17/25
Cemulsion 5/21
Ceresit Waterproofing Corp. 5/7
Dehydratine 5/10
Dens-tect 5/25
Des Moines Elaterite 5/8
Elaterite Paint & Mfg. Co. 5/8
Empire Varnish Co. 17/11
Everseal Mfg. Co., Inc. 17/12

(Continued on Next Page)

DAMPPROOFING—Cont.

Coatings—Paints and Compounds—Cont.

(Continued from Previous Page)

F.W.B. 17/12
Genasco 6/1
Glidden Co. 17/14
Hetson-Sommers Co., Inc. 5/9
Hetzel Roofing Products Co. 6/49
Horn, A. C., Co. 5/10
Hydratine 5/10
Hydrocide 5/18
Hydrolithic Waterproofing Co., Inc. 5/11
Hydron 6/2
Ironite 5/27
Karnak 5/13
Klere-Seal 18/14
Koppers Co. 6/8
Kuhls, H. B. Fred 5/12
Lastik Products Co., Inc. 5/14
Lewis Asphalt Engineering Corp. 5/13
Master Builders Co. 5/15
Mastertex 5/15
Minwax Co., Inc. 5/16
Par-Lock Plaster Key 5/25
Pecora Paint Co., Inc. 18/14
Perma-Seal 5/9
Pittsburgh Plate Glass Co. 17/25
Plastertox 5/22
R.I.W. 5/22
Resto-Crete 5/27
Sommers 5/9
Sonneborn, L., Sons, Inc. 5/18; 17/45
StoneTex 17/31
Tar-Rok 6/2
Super-Por-Seal 5/24
StoneTex 5/24
Super-Por-Seal 17/31
Sika Inc. 5/17
Toch Brothers Inc. 5/22
Toxloxpore 5/22
Truscon Laboratories 5/24; 17/31
Vortex Mfg. Co. 5/25
Waterlox 17/11
Webster, W. F., Cement Co. 5/26
Webtex 5/26
Western Waterproofing Cos. 5/27
Specifications 5/8; 5/8a; 5/11; 5/16; 5/25; 6/2; 6/8; 17/14; 17/25

DENSIFIERS

Cement and Concrete

See Hardeners and Densifiers—Cement and Concrete

DUSTPROOFING COMPOUNDS

Cement and Concrete

See Hardeners and Densifiers—Cement and Concrete

EFFLORESCENCE

Cleaning Compound

See Brick—Cleaning Compound

Deterrents

See Waterproofing

EMULSIONS

Asphalt

See Asphalt Emulsions

ENGINEERS

Waterproofing and Dampproofing

See Waterproofing—Contractors

FABRIC

Waterproofing

See Waterproofing—Felt, Cloth and Fabric

FELT

Waterproofing

See Waterproofing—Felt, Cloth and Fabric

FILLERS

Concrete

Accello 5/2
American Crayon Co. 17/35
Anti-Hydro Waterproofing Co. 5/2
Filtite 17/35
Flamingo 4/50
Horn, A. C., Co. 5/10
Hydratite 5/10
Korkrete 5/13
Korkseal 5/13
Lewis Asphalt Engineering Corp. 5/13
Master Builders Co. 5/15
Old Faithful 17/35
Rex 9/22
Riverton Lime & Stone Co., Inc. 4/50
Staybrite 5/10
Specifications 5/10

Crack or Joint—Cement and Concrete Work

See Joints — Expansion — Concrete — Cement for; Caulking Compounds

FLOOR

Hardeners and Densifiers

See Hardeners and Densifiers

FLOORING

Asphalt

See Asphalt—Emulsions

FORMS

Concrete—Protective Coatings for

Hetson-Sommers Co., Inc. 5/9
Form-X 5/9

GLASS

Block—Joint Compounds

See Cement—Pointing

HARDENERS AND DENSIFIERS

Cement and Concrete

Adaflint 5/1
Adensite Co., Inc. 5/1
Agatex 5/24
American Crayon Co. 17/35
Anti-Hydro Waterproofing Co. 5/2
Aquabar Waterproofing Products, Inc. 5/3
Aquatite 5/3
Armortop 5/2
Art-Roc 5/24
Ceresit Waterproofing Corp. 5/7
Ceretone 5/7
Colored Master Mix 5/15
Colored Metalicron 5/15
Colormix 5/15
Colorundum 5/10
Crescrete 5/7
Dehydratine 5/10
Duracrete 5/3
Duro-Mix 5/3
Durocon 5/3
Dust-X 9/25
Dycrome 5/15
Fastite 9/15
Ferricon 5/24
Ferro-Fax 5/10
Filtite 17/35
Flintox 5/22
Flor-Dye 5/24
Floortex 5/3
Glazecoat 5/15
Hetson-Sommers Co., Inc. 5/9
Hillyard Sales Co. 17/39
Horn, A. C., Co. 5/10
Hornstone Crystals 5/10
Hurundum 5/24
Indurite 5/7
Iron Clad Crystals No. 7B 5/3
Ironco 5/3
Kelley 9/15
Kompo-Seal 11/44
Kompolite Co., Inc. 11/44

(Continued in Next Column)

HARDENERS AND DENSIFIERS—Cont.

Cement and Concrete—Cont.

(Continued from Previous Column)

Lapidolith 17/45
Master Builders Co. 5/15
Master Mix 5/15
Maximent Co. 11/13
Merkin, M. J., Paint Co., Inc. 17/19
Metalicron 5/15
Metalsium 5/7
Old Faithful 17/35
Omicron 5/15
Penetex 5/24
Perfectseal 17/19
PermaRok 5/19
Plastiment 5/17
Pozzolith 5/15
Puzzolanic 5/22
R.I.W. 5/22
Saniseal 5/15
Sika Inc. 5/17
Sonneborn, L., Sons, Inc. 5/18; 17/45
Toch Brothers Inc. 5/22
Tomkins, Calvin Co. 9/15
Tox-Co-Mix 5/22
Toxmix 5/22
Trimix 5/18; 17/45
Truscon Laboratories 5/24
Ven-Ite Co. Inc. 11/14
Venol 11/14
Specifications 5/1; 5/2; 5/3; 5/7; 5/10; 5/15; 11/14; 17/45

INSULATION — COLD STORAGE OR REFRIGERATION

Waterproofing Compounds for

See Waterproofing—Paint and Compounds

JOINTS

Expansion — Asphalt-Fiber Fillers for

Karnak 5/13
Lewis Asphalt Engineering Corp. 5/13

Expansion—Concrete—Cement for

Horn, A. C., Co. 5/10
Hornex 5/10
Kuhls, H. B. Fred 5/12
Vulcatex 5/10
Specifications 5/10; 5/12

Masonry Leadcap for

(See also Flashings) 6
Minwax Co., Inc. 5/16
Weathercap 5/16
Specifications 5/16

MORTAR

Admixtures

See Specific Type as Waterproofing

Colors

See Colors — Mortar — Cement and Stucco

Portland Cement—Waterproofing

See Waterproofing—Integral

Waterproofing

See Waterproofing—Integral

OIL

Proofing

See Waterproofing

PAINT

Asphalt

See Asphalt—Emulsion

Joint

See Caulking Compounds; Cement—Pointing

Waterproofing

See Waterproofing—Paint and Compounds

PLASTER

Bond

(See also Waterproofing—Paint and Compounds)

Anti-Hydro Waterproofing Co. 5/2
Aquabar Waterproofing Products, Inc. 5/3
Aridtite 5/2
Barrett Co. 6/2
Ceresit Waterproofing Corp. 5/7
Dens-tect 5/25
Des Moines Elaterite 5/8
Elaterite Paint & Mfg. Co. 5/8
Everseal Mfg. Co., Inc. 17/12
F.W.B. 17/12
Goldsmith Metal Lath Co. 9/5
Hydrocide 5/18
Karnak 5/13
Lewis Asphalt Engineering Corp. 5/13
Master Builders Co. 5/15
Par-Lock Plaster Key 5/25
Plastertox 5/22
Plastoform 9/5
Reilly Tar & Chemical Corp. 6/10
R.I.W. 5/22
Sonneborn, L., Sons, Inc. 5/18
Statite 5/3
Toch Brothers Inc. 5/22
Truscon Laboratories 5/24
Vortex Mfg. Co. 5/25
Webster, W. F., Cement Co. 5/26
Webtex 5/26
Specifications 5/8; 5/25; 6/2

Waterproofing

See Waterproofing—Paint and Compounds

POINTING

Cement or Compound

See Cement—Pointing; Caulking—Compounds

PRESERVATIVES

Cement Floor

See Hardeners and Densifiers—Cement and Concrete

Masonry

See Waterproofing—Paint and Compounds

PRIMERS

Concrete

See Fillers—Concrete; Asphalts; Waterproofing

PROTECTIVE

Coatings or Compounds—Steel, Concrete, etc.

See Waterproofing—Paint and Compounds

QUICK SETTING

Cement and Concrete

See Accelerators

SPANDRELS

Waterproofing—Felt, Cloth or Fabric for

See Waterproofing—Felt, Cloth or Fabric

STAINS

Mortar, Cement, Concrete and Stucco

See Colors—Mortar, Cement, Concrete and Stucco

STONE

Backing

See Waterproofing; Dampproofing

STUCCO

Colors

See Colors—Mortar, Cement and Stucco

SWIMMING POOL

Paint

See Waterproofing—Paint and Compounds

WATERPROOFING

Admixtures

Accello 5/2
Anti-Hydro Waterproofing Co. 5/2
Aquabar Waterproofing Products, Inc. 5/3
Aquatite 5/3
Duracrete 5/3
Flamingo 4/50
Horn, A. C., Co. 5/10
Hydratine 5/10
Hydrocide 5/18
Master Builders Co. 5/15
Medusa Portland Cement Co. 4/49
Omicron Pozzolith 5/15
Quick Set 5/3
Rex 9/22
Riverton Lime & Stone Co., Inc. 4/50
Sonneborn, L., Sons, Inc. 5/18
Staybrite 5/10
Trimix 5/18
Truscon Laboratories 5/24
See also 9/25
Specifications 5/10

Asphaltic

See Waterproofing—Paint and Compounds; Asphalt, etc.

Cement Coating

Accello 5/2
Anti-Hydro Waterproofing Co. 5/2
Aquabar Waterproofing Products, Inc. 5/3
Artstone Rocor Corp. 17/3
Bondex 17/29
Cementex 5/3
Elasticote 5/3
Everseal Mfg. Co., Inc. 17/12
F.W.B. 17/12
Horn, A. C., Co. 5/10
Hornrock 5/10
Hydrolithic Waterproofing Co., Inc. 5/11
Ironite 5/27
Minwax Co., Inc. 5/16
Par-Lock 5/25
Quick-seal 5/20
Reardon Co. 17/29
Rocor 17/3
Standard Dry Wall Products, Inc. 5/20
Staybrite 5/10
Symentrex 5/10
Thoro-seal 5/20
Truscon Laboratories 5/24
Vortex Mfg. Co. 5/25
Waterplug 5/20
Webster, W. F., Cement Co. 5/26
Webtex 5/26
Western Waterproofing Cos. 5/27
See also 5/21
Specifications 5/10; 5/11; 5/16; 5/20; 17/3

Combination Metal Sheet, Asphalt, Felt, etc.

Brisk Waterproofing Co., Inc. 5/4
Larson 5/4
Wasco Flashing Co. 6/48

Contractors

Anti-Hydro Waterproofing Co. 5/2
Brisk Waterproofing Co., Inc. 5/4
Hetson-Sommers Co., Inc. 5/9
Horn, A. C., Co. 5/10
Hydrolithic Waterproofing Co., Inc. 5/11
Kellogg, M. W., Co. 26/129
Larson 5/4
Master Builders Co. 5/15
Minwax Co., Inc. 5/16

(Continued in Next Column)

WATERPROOFING—Cont.

Contractors—Cont.

(Continued from Previous Column)

Permantite 5/9
Rust Engineering Co. 26/130
Sonneborn, L., Sons, Inc. 5/18
Standard Dry Wall Products, Inc. 5/20
Standard Waterproofing Corp. 5/19
Structural Waterproofing, Inc. 5/21
Western Waterproofing Cos. 5/27
Specifications 5/10; 5/11

Felt, Cloth, Fabric, etc.

Angier Corp. 10/1
Asbestile 6/7
Barber Asphalt Co., Inc. 6/1
Barco-Dex 6/20
Barnett Canvas Goods & Bag Co., Inc. 6/20
Barrell, William L., Co., Inc. 6/21
Barrett Co. 6/2
Bird & Son, inc. 6/3
Brisk Waterproofing Co., Inc. 5/4
Byers 6/47
Carey, Philip, Co. 6/4
Celotex Co. 6/5
Certain-teed Products Corp. 6/6
Cheney Co. 6/43
Con-Ser-Tex 6/21
Copper Armored Sisalkraft 10/2
Copper Kote 6/43
Copperskin 10/1
Flintkote Co. 6/13
Genasco 6/1
Hetson-Sommers Co., Inc. 5/9
Horn, A. C., Co. 5/10
J-M 6/7
Johns-Manville 6/7
Karnak 5/13
Koppers Co. 6/8
Larson 5/4
Lewis Asphalt Engineering Corp. 5/13
Minwax Co., Inc. 5/16
Neponset 6/3
Ru-Ber-Oid 6/9
Ruberiod Co. 6/9
Sisalkraft Co. 10/2
Spando 6/43
Spandreltite 5/9
Triple-Flex 5/10
Turner Resilient Floors, Inc. 6/47
Webster, W. F. Cement Co. 5/26
Webtex 5/26
See also 5/21
Specifications 5/10; 5/13; 5/16; 6/1; 6/2; 6/3; 6/5; 6/6; 6/7; 6/8; 10/2

Integral—Concrete, Mortar, etc.

Adensite Co., Inc. 5/1
Aguaseal 17/19
Anti-Hydro Waterproofing Co. 5/2
Aquabar Waterproofing Products, Inc. 5/3
Aquatite 5/3
Armstrong Cork Products Co. 11/63
B-T 11/13
Ceresit Waterproofing Corp. 5/7
Compound No. 1 5/3
Des Moines Elaterite 5/8
Duracrete 5/3
Elaterite Paint & Mfg. Co. 5/8
Fastite 9/15
Hetson-Sommers Co., Inc. 5/9
Horn, A. C., Co. 5/10
Hydratite 5/10
Hydrocide 5/18
Kelley 9/15
Konkerit 5/22
Kuhls, H. B. Fred 5/12
Leakproof 5/15
Master Builders Co. 5/15
Maximent Co. 11/13
Medusa-Brikset 4/49
Medusa Portland Cement Co. 4/49
Merkin, M. J., Paint Co., Inc. 17/19

(Continued on Next Page)

WATERPROOFING—Cont.

Integral—Concrete, Mortar, etc.—Cont.

(Continued from Previous Page)

Mortite 5/24
Mortaron 5/3
Permantite 5/9
R.I.W. 5/22
Ru-Ber-Oid 6/18
Ruberoid Co. 6/18
Santorized Trimix 5/18
Standard Dry Wall Products, Inc. 5/20
Sika Inc. 5/17
Sonneborn, L., Sons, Inc. 5/18
Staybrite 5/10
Stearate 5/1
Stearox "30" 5/15
Superior Cement Corp. 4/51
Thoro-seal 5/20
Toch Brothers Inc. 5/22
Tomkins, Calvin, Co. 9/15
Toxement 5/22
Toxmix 5/22
Truscon Laboratories 5/24
Wifco 4/51
See also 5/23; 9/25
Specifications 4/51; 5/1; 5/2; 5/3; 5/7; 5/8; 5/10; 5/15; 5/18; 5/20; 5/24

Iron Method

Aquabar Waterproofing Products, Inc. 5/3
Ceresit Waterproofing Corp. 5/7
Ferritex 5/24
Ferrocon 5/3
Horn, A. C., Co. 5/10
Ironco 5/3
Ironite 5/27
Master Builders Co. 5/15
Metalon 5/10
R.I.W. 5/22
Toch Brothers Inc. 5/22
Truscon Laboratories 5/24
Western Waterproofing Cos. 5/27
See also 5/21
Specifications 5/3; 5/7; 5/10

Mastic

See Asphalt Emulsion

Membrane Method

See Waterproofing—Paint and Compounds; Waterproofing—Felt, Cloth and Fabric; Waterproofing—Combination Metal Sheet, Asphalt, Felt, etc.

Paint and Compound

(For Surface Treatments or for use with Membrane Systems)
(See also Dampproofing)

Adensite Co., Inc. 5/1
Amurseal 5/2
Anti-Hydro Waterproofing Co. . 5/2
Aquabar Waterproofing Products, Inc. 5/3
Aquaseal 17/19
Aridclear 5/2
Aridtite 5/2
Arnesto Paint Co., Inc. 17/2
Artstone Rocor Corp. 17/3
B-T 11/13
Barber Asphalt Co., Inc. 6/1
Barrett Co. 6/2
Berry Brothers, Inc. 17/4
Billings-Chapin Co. 5/8a
Bird & Son, Inc. 6/3
Bondex 17/29
Bondlite 17/34
Bondo 3/33
Cabot, Samuel, Inc. 5/5; 17/6
Calbar Paint & Varnish Co. 5/6
Caulk-O-Seal 5/6
Cemcoat 17/45

(Continued in Next Column)

WATERPROOFING—Cont.

Paint and Compound—Cont.

(Continued from Previous Column)

Cementex 5/3
Cementhide 17/25
Ceresit Waterproofing Corp. 5/7
Clear Coat 5/3
Clerseal 5/1
Collopake 17/6
Cork Import Corp. 10/44
Dehydratine 5/10
Dens-tect 5/25
Des Moines Elaterite 5/8
Driwal 5/8a
Elasticote 5/3
Elastigum 6/2
Elaterite Paint & Mfg. Co. 5/8
Empire Varnish Co. 17/11
Everseal Mfg. Co., Inc. 17/12
F.W.B. 17/12
Flintkote Co. 6/13
Genasco 6/1
Granite 17/4
Hetzel Roofing Products Co. 6/49
Hetson-Sommers Co., Inc. 5/9
Horn, A. C., Co. 5/10
Hornrock 5/10
Hydrocide 5/18
Hydronon 6/2
Karnak 5/13
Kaukit 5/18
Klere-Seal 18/14
Konkerit 5/22
Koppers Co. 6/8
Korkrete 5/13
Korkseal 5/13
Krodeproof 5/13
Kuhls, H. B., Fred 5/12
Lastphalt 11/13
Leakproof 5/15
Lewis Asphalt Engineering Corp. 5/13
Lionoil 17/4
Marine Cement No. 3A 5/3
Master Builders Co. 5/15
Masterseal 5/15
Mastertex 5/15
Mastic Insulite Cement No. 4 .. 5/3
Maximent Co. 11/13
Merkin, M. J., Paint Co., Inc. ..17/19
Metalon 5/10
Midland Chemical Laboratories, Inc. 17/42
Midseal 17/42
Minwax Co., Inc. 5/16
National Naylegrip Co., Inc. 3/33
Neponset 6/3
Omicron 5/15
Par-Lock Plaster Key 5/25
Pecora Paint Co., Inc. 18/14
Penetex 5/24
Pittsburgh Plate Glass Co. 17/25
Plastic XC 6/2
Quick-seal 5/20
R.I.W. 5/22
Reardon Co. 17/29
Reilly Tar & Chemical Corp. 6/10
Resto-Crete 5/27
Ric-wiL 26/120
Rocor 17/3
Ru-Ber-Oid 6/18
Ruberoid Co. 6/18
Self Healing Bridge Cement 5/22
Semi-Mastic 5/3
Somotex 5/9
Sonneborn, L., Sons, Inc. .5/18; 17/45
Standard Dry Wall Products, Inc. 5/20
Standard Waterproofing Corp. .. 5/19
Stanwaco 5/19
Static 6/13
Statite No. 3 ..... 5/3

(Continued in Next Column)

WATERPROOFING—Cont.

Paint and Compound—Cont.

(Continued from Previous Column)

Stearox "30" 5/15
Stone Backing No. 3B 5/3
Stonewall 10/44
Super-Por-Seal 5/24
Symentrex 5/10
Tar-Rok 6/2
Thoro-seal 5/20
Toch Brothers Inc. 5/22
Toxloxpore 5/22
Trimix 5/18
Truscon Laboratories 5/24
Venostone 17/29
Vortex Mfg. Co. 5/25
Waterlox 17/11
Webster, W. F., Cement Co. 5/26
Webtex 5/26
Western Waterproofing Cos. 5/27
Western's-Ironite 5/27
Western's-Repellant 5/27
Wilbur & Williams Co. 17/34
See also 5/21; 5/23; 6/14
Specifications .. 5/2; 5/5; 5/7; 5/8; 5/8a; 5/10; 5/13; 5/15; 5/16; 5/18; 5/25; 6/2; 6/8; 17/3; 17/4; 17/6; 17/25; 17/29

Pre-Formed Unit

See Waterproofing—Combination Metal Sheet, Asphalt, Felt, etc.; Waterproofing—Felt, Cloth and Fabric

Protective Coatings

See Waterproofing—Felt, Cloth, Fabric, etc.

Transparent

Adensite Co., Inc. 5/1
All-Weather 5/15
Anhydrosol 5/22
Anti-Hydro Waterproofing Co. . 5/2
Aquabar Waterproofing Products, Inc. 5/3
Aquaseal 17/19
Aridclear 5/2
Art-Roc 5/24
Billings-Chapin Co. 5/8a
Cabot, Samuel, Inc. 5/5; 17/6
Ceresit Waterproofing Corp. 5/7
Cersolac 5/7
Clear Coat 5/3
Clerseal 5/1
Collopake 17/6
Dehydratine 5/10
Driwal 5/8a
Empire Varnish Co. 17/11
Everseal Mfg. Co., Inc. 17/12
F.W.B. 17/12
Hetson-Sommers Co., Inc. 5/9
Horn, A. C., Co. 5/10
Hydrocide 5/18
Klere-Seal 18/14
Kuhls, H. B. Fred 5/12
Lastik Products Co., Inc. 5/14
Master Builders Co. 5/15
Masterseal 5/15
Merkin, M. J., Paint Co., Inc. 17/19
Minwax Co., Inc. 5/16
Pecora Paint Co., Inc. 18/14
Permaseal 5/9
R.I.W. 5/22
Sika Inc. 5/17
Sonneborn, L., Sons, Inc. 5/18
Super-Por-Seal 5/24
Toch Brothers Inc. 5/22
Truscon Laboratories 5/24
Waterlox 17/11
Webster, W. F., Cement Co. ... 5/26
Webtex 5/26
See also 5/23; 9/25
Specifications 5/8a; 5/10; 5/15; 5/16; 5/18; 5/26; 17/6

ADENSITE CO., INC.

Manufacturers of Concrete Waterproofings and Hardeners

152 West 42nd Street, NEW YORK, N. Y.

LABORATORY: 25-25 51st Avenue, LONG ISLAND CITY, N. Y.

Products

ADENSITE, Liquid Integral used in gauging water for Hardening and Waterproofing portland cement concrete and mortar.
ADAFLINT, a flush-on Floor Hardener in crystal form.
CLERSEAL, a colorless Waterproofer.
STEARATE PASTE, an integral Waterproofing in paste form.
PURTONE COLORS, mineral color in powder form for portland cement Floor Finish.

ADENSITE—A LIQUID INTEGRAL WATERPROOFER

Uses — Waterproofing concrete walls below grade, either in mass concrete or in plaster coat.

Hardening and dustproofing cement floor finish.

Waterproofing portland cement stucco.

For brick masonry, Adensite gauged mortar is smooth working, does not drag and prevents "riding."

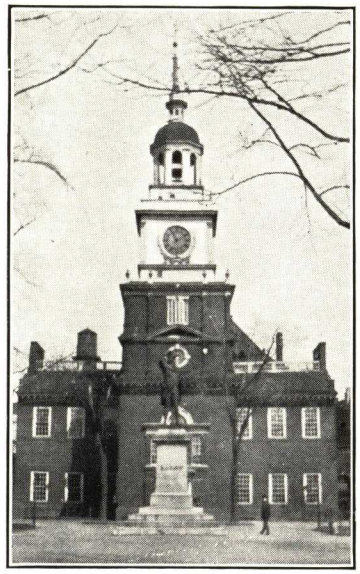
Authoritative Tests—Upon request, we shall be pleased to furnish the architect with authoritative test data on Adensite, compiled from testing laboratory results and research work carried out at the U. S. Bureau of Standards for the A. S. T. M.

Guarantee—Adensite is unconditionally guaranteed to produce positive and permanent results by the manufacturers, the ADENSITE CO., INC. Surety maintenance bonds furnished on waterproofing jobs.

Service—Our field men visit construction operations while Adensite is in use.

A LIQUID INTEGRAL ADENSITE ITS FUNCTION GUARANTEED

TRADE-MARK



Independence Hall, Philadelphia
Waterproofed with Adensite gauged plaster coat

Adensite Specifications

Waterproofing Mass Concrete — The gauging liquid for concrete shall be prepared by placing from 3 to 4 gal. of Adensite in a 52-gal. barrel and adding water. Adensite can be added direct to the water in mixer before letting in the dry mix. For every 1-bag batch, use between 3 and 4 gal. of the prepared liquid (amount of liquid varies with fineness of aggregate and temperature).

Joints Between Pourings—Shall be thoroughly grouted with Adensite grout.

Waterproof Plaster Coatings—Shall be ⅝ in. in thickness, applied in 2 coats and properly coved and bonded to the floor.

Bonding New to Old Concrete—All surfaces before application of new work shall be thoroughly roughed, cleaned and dampened with Adensite grout to insure perfect bond.

Adensite Grout—Add 1 part Adensite to 3 parts water and enough cement to give mixture a creamy consistency.

Protection of Green Work—To protect green work against action of water, the pump shall be kept in operation 24 hours after pouring or troweling of work.

Floor Hardening—Upon the plain concrete floor slab shall be laid a 1-in. topping of 1 part cement and 2 parts clean sand.

This dry mix shall be tempered with a liquid composed of 3 gal. of water to 1 qt. of Adensite for every 1-bag batch. No dryer shall be used.

Gauging Liquid for Floor Finish—Gauging liquid may be prepared by putting 4 gal. of Adensite into a 52-gal. barrel and adding water (no stirring required).

Bond—When slab is over 48 hours old, before topping is stretched, it shall be given a coating of Adensite grout.

When slab is over 7 days old, before topping is stretched, it shall be roughed with a pick or chisel, cleaned and given a coat of Adensite grout.

Brick Masonry—The mortar shall be composed of 1 part portland cement, and 3 parts clean sand, tempered with a liquid composed of 1 part Adensite to 12 parts water.

Shipments

Adensite is shipped in 5, 30 and 50-gal. containers.

Stearate Paste is shipped in 440, 240 and 40-lb. containers.

Adaflint is shipped in 2-lb. boxes, 25 to a case.

Clerseal is shipped in 5, 30 and 50-gal. barrels.

Some Users of Adensite

Grosvenor Atterbury, New York, N. Y.
Alfred C. Bossom, New York, N. Y.
Harold B. Brady, Elizabeth, N. J.
Bureau of Yards & Docks, Washington, D. C.
Clinton & Russell, New York, N. Y.
George W. Conable, New York, N. Y.
Day & Klauder, Philadelphia, Pa.
Delano & Aldrich, New York, N. Y.
Dennison & Hirons, New York, N. Y.
I. E. Ditmars, New York, N. Y.
C. E. C. Dyson, Toronto, Ont., Canada
J. H. & W. C. Ely, Newark, N. J.
J. W. Ferguson Co., Paterson, N. J.
Fletcher-Thompson Co., Inc., Bridgeport, Conn.
D. R. Franklin, Toronto, Ont., Canada
John F. Jackson, New York, N. Y.
Mack & Sahm, Wilkes-Barre, Pa.
John Molitor, City Architect, Philadelphia, Pa.
New York Central Railroad Co., New York, N. Y.
John T. Rowland, Jr., Jersey City, N. J.
F. B. & A. Ware, New York, N. Y.
Warren & Wetmore, New York, N. Y.
F. W. Wentworth, Paterson, N. J.

Pure Double Pressed Stearate with Pozzolana

Adensite 30% Double Pressed Stearate Paste with Pozzolana waterproofs concrete, mortar and plaster. This paste gives added workability and plasticity and reduces shrinkage of concrete and mortar. Specifications on request.

Adaflint—An Applied Hardener for Cement Floors

Adaflint, dissolved in water, 2 lb. to the gallon and slushed over an old or new floor, will render a cement finish hard and dustless. Furnished in natural gray, oak and green.

Clerseal—Colorless Waterproofing for Masonry Above Grade

Clerseal can be applied with brush or spray. One gallon is sufficient for 200 to 300 sq. ft. of surface in one application.

5/2

ANTI-HYDRO WATERPROOFING CO.

TELEPHONE
Bigelow 3-5440

295 Badger Avenue, NEWARK, N. J.

ESTABLISHED 1904

REPRESENTATIVES, SERVICE AND STOCK IN ALL LARGE CITIES

ANTI-HYDRO OF CANADA LTD., 309 Shaughnessy Bldg., 407 McGill St., MONTREAL, CANADA

Products and Services

"ANTI-HYDRO," a Liquid Integral Compound for *Waterproof* and *Durable* Concrete or Mortar; increases and hastens *Hardening* and *Strength* for portland cement mixtures.

ARMORTOP, a penetrating liquid applied *Hardener* and *Dust Preventer* for *Cement Floor* Surfaces.

AMURSEAL, a black liquid *Dampproofing* applied to exterior of *Foundation Walls and Footings.*

ARIDTITE, a black liquid *Dampproofing* and *Plaster Bond* coat for interior of *Walls above Grade.*

ARIDCLEAR, a transparent liquid *Dampproofing* for *Stone, Brick, Stucco* or *Cement Walls above Grade.*

ACCELLO, a water solution of calcium chloride for *Accelerating* the *Set of Concrete* in *Cold Weather* and *Preventing Freezing.*

ADMIXTURE, a finely divided silica admix, used to increase plasticity and durability of concrete.

CALKING COMPOUNDS—*Plastic Material for Knife or Gun Application:* made in black or gray and shipped in 1-gal., 5-gal., 30-gal. and 55-gal. containers. It adheres perfectly to all construction materials.

CONSULTING WATERPROOFING ENGINEERS for consultation and design for all waterproofing constructions.

25-Year Guarantee

Written guarantees to maintain waterproof concrete for 25 years and damp-proof masonry for 5 years have been furnished on many important installations under our supervision.

A surety bond may be obtained on all waterproof installations supervised by Anti-Hydro Engineers.

"ANTI-HYDRO" INTEGRAL WATERPROOFING AND HARDENER

Description—"Anti-Hydro" is a liquid compound, reacting chemically with portland cement. There are no alums, hydrate of lime, greases, oils, stearic acid, iron admixtures or other decomposable ingredients. "Anti-Hydro" causes cement to hydrate to a far greater percentage than with water alone and speeds the hardening of the cement. The result is dense, hard waterproof cement masonry of increased compressive and tensile strength, impervious to water, moisture, frost, oils, sugar solutions, alkalis, sea water and remarkably resistant to acid action.

"ANTI-HYDRO" FOR PERMANENT CONCRETE HARDENS WATERPROOFS

Tests—Reports of comparative tests made at the following laboratories are available:

National Bureau of Standards; California Institute of Technology; Case School of Applied Science; Columbia University; E. L. Conwell & Co.; Georgia School of Technology; David Kirkaldy Laboratories, London, England; H. C. Nutting Co.; Pittsburgh Testing Laboratories; University of Michigan.

Functions of "Anti-Hydro"—

(1) *Waterproofs* concrete and mortar.

(2) *Increases the plasticity and workability* of concrete and cement mortars.

(3) Produces *durable concrete, permanent* against *water, weather,* and *frost.*

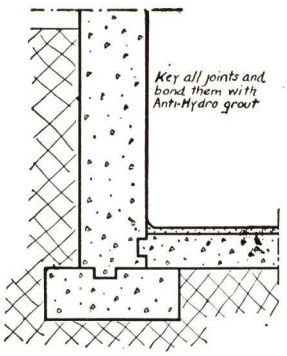
(4) *Increases* and *speeds compressive* and *tensile strength* of mortars and concrete, with *increased ultimate strength.*

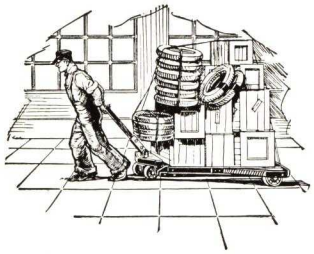
(5) *Hardens* and *dustproofs* cement floor toppings.

(6) *Prevents corrosion* of steel reinforcing.

(7) Protects concrete against *freezing,* during and after placement.

(8) *Bonds* securely concrete between pourings and permanently holds cement toppings to slabs.





Hardens and Dustproofs Concrete Floors

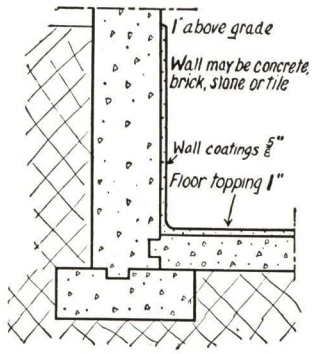
"Anti-Hydro" Specifications

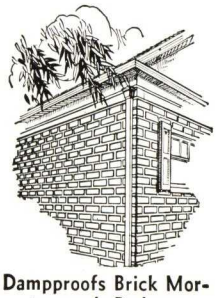
Waterproofing Mass Concrete—For 1:2:4 concrete not over 5½ gals. of water per bag of cement shall be used for gauging and 1 qt. of "Anti-Hydro" shall be added to the mixture with or immediately after the water. Not less than 1½ gals. of "Anti-Hydro" shall be used per cubic yard of concrete. Concrete shall be well spaded when placed in forms. All surface and ground water must be pumped or drained away from the forms during pouring and for 24 hours thereafter. All joints shall be keyed and bonded with "Anti-Hydro" grout. (See bonding directions following.)

Hardening and Waterproofing Floors—Cement floor toppings of 1:2 mix shall be of 1-in. thickness and shall be hardened and waterproofed by the addition of 1 gal. "Anti-Hydro" per barrel (4 bags) of cement. Proper consistency of the mortar will be obtained by gauging the mixture with not over 3½ gals. of water per bag of cement and 1 qt. of "Anti-Hydro" added with or immediately after the water. This procedure insures the double purpose of hardening and waterproofing cement surfaces exposed to wear in one operation. The topping shall be bonded to underlying concrete according to bonding directions following.

Waterproofing Wall Coatings—Wall coatings of cement plaster shall be of 1:2 mix and gauged by the addition to the water of 1 gal. of "Anti-Hydro" per barrel (4 bags) of cement. They shall be applied in 2 coats (scratch and finish), shall be ⅝ in. thick above the floor level to at least 1 ft. above grade, and shall be coved at base and bonded to the floor and underlying masonry.

Waterproofing Masonry Mortar—Portland cement and sand mortar for use with brick, block or stone shall be of 1:3 mix, gauged and tempered with a solution of 1 volume of "Anti-Hydro" in 15 volumes of water. Wet all brick. Push-lay and thoroughly grout all brick at every course. Parge with same mortar between the face brick and back-up masonry.





Dampproofs Brick Mortar and Reduces Efflorescence

Calking Leaks Under Pressure—"Anti-Hydro," undiluted, can be added to *fresh* portland cement to the consistency of a thick paste, for plugging leaks against water pressure in concrete or masonry. Ask for special instructions.

Bonding Old and New Concrete—To assure perfect bond to abutting masonry or concrete, all old surfaces shall be roughened thoroughly, cleaned, dampened and grouted. The grout shall be made by stirring ½ to ⅔ bag of portland cement gradually into a solution of 1 gal. of "Anti-Hydro" in 3 gals. of water until a thick, creamy consistency is obtained. After applying this grout to the prepared surface, the concrete or mortar shall be placed *while the grout is still wet.*

Note: Other specifications for waterproofing furnished on request: *Cast Stone, Stucco, Dampproof Paint, Road Work, Acid Resistance.*

"ANTI-HYDRO" QUANTITIES

Kind of work	Quantity Anti-Hydro per bbl. cement	Covering capacity
Waterproofing in mass 1:2:4 concrete	1 gal.	⅔ cu. yd. concrete
Waterproofing ⅝-in. plaster coat	1 gal.	100 to 125 sq. ft.
Waterproofing 1-in. floor topping	1 gal.	100 to 80 sq. ft.
Waterproofing stucco ⅞ in.	1 gal.	100 sq. ft.
Dampproofing brickwork ⅜-in. joint 1:3	1 gal.	1000 brick or 50 cu. ft.
Dampproofing in cement wash	8 gal.	2400 sq. ft.—2 coats
Dampproofing in. ⅜-in. cement plaster	1 gal.	150 sq. ft.
Hardening cement floor 1-in. topping	1 gal.	100 to 80 sq. ft.

How Shipped. "Anti-Hydro" is shipped in standard containers of 1 gal., 5 gal., 20 gal., and 30 gal.

OTHER "ANTI-HYDRO" PRODUCTS

Aridclear Dampproofs Exterior Masonry

ARIDCLEAR
THE TRANSPARENT DAMPPROOFING
TRADE-MARK

Aridclear, a transparent dampproofing, prevents the penetration and absorption of driving rains into exposed masonry of brick, stone, stucco, or cement. One gallon dampproofs from 70 to 120 sq. ft.

Specifications—Cut out open joints and remove loose mortar. Point up with trowel using cement and sand mortar waterproofed with "Anti-Hydro". To the clean, dry masonry apply two saturating coats of Aridclear with brush or spray. Allow at least 12 hours between coats.

How Shipped—Aridclear is shipped in 1-gal., 5-gal., 30-gal. and 50-gal. containers.

Armortop, Applied Hardener and Dustproofer for Concrete

ARMORTOP
THE APPLIED HARDENER FOR CONCRETE
TRADE-MARK

Description—Armortop is a liquid compound, which, applied to new or old concrete surfaces, changes soft granular topping into a granite-like mass that resists most severe wear and abrasion without dusting. It saves tearing up and relaying old floors beginning to rut. The complete transformation can be accomplished in the evening after closing hours, by unskilled labor.

Armortop penetrates into the concrete and reacts chemically with the cement, binding the loose disintegrating particles of the dry concrete into a dense, hard mass, with permanent results. Armortop should not be confused with temporary paint coatings.

The covering capacity of Armortop varies with the density of the floor. One gallon will completely harden from 70 to 150 sq. ft. of floor surface.

A concrete test slab showing the results of Armortop treatment will be sent on request.

Specifications—Upon the clean, dry floor apply a solution of 1 part Armortop and 1 part water in 2 or more coats, depending upon the density of the floor. Allow 4 hours to elapse between applications.

How Shipped—Armortop is shipped in containers of 1 gal., 5 gal., 30 gal. and 50 gal.

Amurseal Dampproofing

AMURSEAL
THE FOUNDATION DAMPPROOFING
TRADE-MARK

Amurseal, a black liquid asphaltic dampproofing, may be applied cold with spray or brush to the exterior of foundation walls or exposed concrete. Two coats give a solid, elastic film. Covering capacity approximately 80 sq. ft. per gallon, single coat; 50 sq. ft. per gallon, two coats.

How Shipped—Amurseal is shipped in drums of 5 gal., 30 gal. and 55 gal.

Aridtite Dampproofing and Plaster Bond

ARIDTITE
THE DAMPPROOF PLASTERBOND
TRADE-MARK

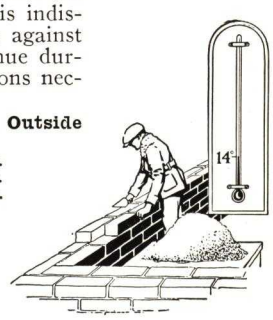
A black liquid asphaltic dampproofing and plaster bond applied cold to the inside surface of exterior walls in a single coat. Aridtite provides a perfect bond for plaster and assures a lasting job. It prevents moisture passing through the walls and thus eliminates stains and discolorations on plaster. Also used for coating unexposed sides of cut stone. Covering capacity, approximately 80 sq. ft. per gallon, single coat.

How Shipped—Aridtite is shipped in drums of 5 gal., 30 gal. and 55 gal.

Accello, Concrete Accelerator and Anti-Freeze

ACCELLO
For Accelerating the Set of Cement
TRADE-MARK

Description—Accello, a standardized solution of calcium chloride, uniform in quality and strength, is used to accelerate the set of cement in concrete, mortar and floor finish in very cold weather, and to prevent freezing of portland cement mixtures at temperatures as low as 14° F. In plain concrete, cement plaster, floor toppings, brick mortar and road work, the use of Accello during the winter months, when the temperature falls as low as 14° F., is indispensable. It insures masonry work against freezing and permits work to continue during the cold weather. The proportions necessary are shown below:



Proportions Accello and Water at Outside Air Temperatures—

35° F., 1 part Accello to 20 parts water.
32° F., 1 part Accello to 15 parts water.
28° F., 1 part Accello to 12 parts water.
25° F. (or less), 1 part Accello to 10 parts water.
14° F. (or less), mechanical heat is necessary.

How Shipped—Accello is shipped in 50-gal. barrels and 5-gal. drums.

Detailed Information

Write for complete data and specifications for any work within the scope of "Anti-Hydro" products.

Dealers Everywhere Carry Stock

A complete stock of "Anti-Hydro" products is carried by dealers throughout the country.

The Services of Our Engineers Are Available at All Times

AQUABAR WATERPROOFING PRODUCTS, Inc.

Waterproofings, Dampproofings, Floor Hardeners, Technical Paints
"Known the World Over"

Perry Building, PHILADELPHIA, PA.

Representatives in All Principal Cities—Nearest Dealers Name Furnished on Request

Products

INTEGRAL COMPOUND No. 1 WATERPROOFING PASTE.
DURACRETE PUZZOLANIC PLASTICIZER FOR CONCRETE (Liquid or Dry).
AQUATITE INTEGRAL LIQUID WATERPROOFING.
CONCENTRATED INTEGRAL WATERPROOFING POWDER.
CEMENTITE ADMIXTURE FOR WORKABILITY (Powder).
MORTARON SHRINKPROOFING PLASTICIZER FOR MASONRY MORTAR (Liquid or Dry).
CLEAR COAT No. 2 COLORLESS WATERPROOFING LIQUID.
FERROCON METALLIC WATERPROOFING.
IRONCO NON-SHRINK AGGREGATE and BONDING IRON.
STATITE PLASTER BOND No. 3 DAMPPROOFING PAINT
MARINE CEMENT No. 3A.
STONE BACKING No. 3B.
MASTIC INSULITE CEMENT No. 4 (Trowel).
SEMI MASTIC.
EMULSIFIED ASPHALT.
IRON-CLAD CRYSTALS No. 7B FLOOR HARDENER.
IRON-CLAD LIQUID FLOOR HARDENER (Surface Treatment).
DURO-MIX INTEGRAL LIQUID FLOOR HARDENER.
DUROCON METALLIC HARDENER.
QUICK-SET ANTI-FREEZE and ACCELERATOR.
PRESERVO WOOD FLOOR PRESERVATIVE.
FLOORTEX CONCRETE PRESERVATIVE.
CONCO CEMENT FLOOR PAINT.
CEMENTEX CEMENT PAINT.
ELASTICOTE No. 6 WATERPROOFING PAINT.
AQUATEX ELASTIC CAULKING COMPOUND.
GLAZTEX FLOOR WAX.

THIRTY-EIGHT YEARS OF QUALITY AND SERVICE, 1901-1939

Over a quarter of a century resistance to storm, sleet and rain, as well as torrid suns, is the test to which AQUABAR PRODUCTS have successfully been subjected. The methods described are the development of the best practice known to waterproofing engineering and cover practically every field encountered in building construction and maintenance. Each product is the result of many years' careful research in our laboratories, and is added to the AQUABAR line only after the most exhaustive tests have shown each to be the most efficient in its respective field. Architects' and Engineers' specifications, test data, testimonials, etc., furnished upon request without obligation.

INTEGRAL WATERPROOFINGS

Integral Compound No. 1—A soft semi-paste which is easily dissolved in water for waterproofing foundation walls, floors, roof slabs, and all other forms of plain and reinforced concrete where absolute watertightness is essential; lubricates, with no increase of water, without affecting tensile strength; renders surface free from honeycomb by increased density.

Specifications for Waterproofing Mass Concrete—A dry mixture of cement, sand and stone 1:2:4 mix, shall be tempered to a medium wet consistency with water to which 1 part of AQUABAR Integral Compound No. 1 has been added to every 50 parts of water in strict accordance with manufacturer's directions.

Machine Mix—Figuring ½ gal. basis, add ⅔ pt. to each bag cement for mass concrete 1:2:4 mix, etc.

Covering Capacity—Use approx. ½ gal. per cu. yd. mass concrete 1:2:4 mix for ordinary moisture conditions; where water pressure exists, use ⅔ to 1 gal. per cu. yd.

Specifications for Waterproofing Cement Mortar and Stucco—The waterproofed cement mortar, consisting of 1 part cement, 2 parts sand with water shall be prepared by tempering to the proper consistency, to which 1 part of Integral Compound No. 1 has been added to every 25 parts water, in strict accordance with manufacturer's directions.

Covering Capacity—Approx. 1 gal. will waterproof 150 to 225 sq. ft. stucco (depending upon wetness of mix) ¾ in. plaster coat.

Aquatite Integral Liquid Waterproofing—A liquid compound for waterproofing, hardening and accelerating all concrete mixtures and cement mortar. Mixes readily and uniformly, insuring strength and hardness to concrete. Lubricates and enriches cement mortar, permitting quicker and easier troweling and, due to this plasticity and reduced amount of gauging water, prevents shrinkage from joints and efflorescence.

Specifications for Waterproofing Mass Concrete—To the 1:2:4 mixture for gauging add 1 gal. of Aquatite for every cubic yard concrete. Proper consistency will be obtained if for each barrel of cement 1 gal. of Aquatite and from 10 to 15 gal. of water be used. If forms are below water level, an extremely stiff mixture should be poured.

Machine Mix—Figuring on 1-gal. basis add ⅔ qt. each bag cement for mass concrete 1:2:4 mix.

Covering Capacity—Use 1 gal per cu. yd. mass concrete 1:2:4 mix for ordinary moisture conditions. Where water pressure exists, use 1½ gal. per cu. yd.

Specifications for Waterproofing Cement Mortars—The 1:2 mortar shall be gauged by the addition of Aquatite to all water used in the proportion of 1 gal. each barrel (4 bags) cement.

Machine Mix—Add 1 qt. to each bag cement.

Covering Capacity—1 gal. will waterproof 100 sq. ft. 1 in. top coat 1:2 mortar or waterproof sufficient mortar to set up 1000 brick.

WATERPROOFINGS

Clear Coat No. 2 Colorless Waterproofing—Colorless transparent liquid for waterproofing, preserving, stainproofing exterior masonry walls above grade, cement, brick, stone masonry, limestone, concrete, stucco, terra cotta, etc. Does not change the appearance of the coated surface, nor leave a film upon application. Penetrates, filling all pores, rendering surface impervious to moisture and driving rains, permanently.

Covering Capacity—Approx. 125 sq. ft. per gal. 1 coat, 80 sq. ft. 2 coats, depending upon porosity.

Ferrocon Metallic Waterproofing—Iron method for waterproofing concrete, brick and similar surfaces on interior against pressure. Finely powdered iron mixed with sand, cement and water, and applied with brush to the inside surface of the foundation to waterproof against absorption of moisture and seepage of water. For use on old and new structures. Three to five coats recommended for pressure. Detailed specifications furnished upon request.

Specifications—Clean and roughen all surfaces, making them free from all foreign matter by scraping all loose material off and wirebrushing if necessary. Cut out all cracks and openings to a depth of 1 in. and fill with stiff mortar. Wet entire surface to be waterproofed. Under no circumstances use Ferrocon on dry surface.

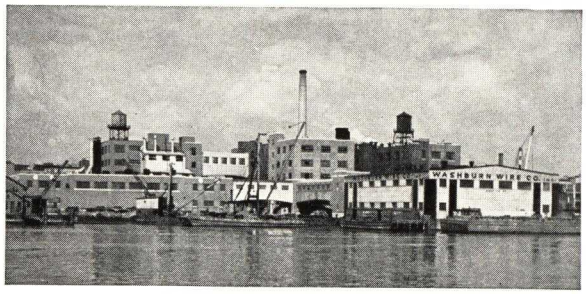
1st coat: Ferrocon and water mixed to creamy consistency.

2nd coat: Ferrocon and cement mixed with water brushed on.

3rd coat: Ferrocon and cement mixed with water troweled on.

Add Ferrocon to water slowly, stirring constantly. Should be well rubbed in with rotary motion. Allow to become thoroughly dry, assuming reddish brown color. For additional coats use mixture same as for second coat.

Covering Capacity—Approx. 10 to 15 lbs. per 100 sq. ft. depending upon porosity.



Washburn Wire Co., 116th St. and East River, New York, N. Y.
Entire substructures waterproofed with Integral Compound No. 1
Hydrostatic pressure. Private plans
JOHN H. DEEVES & BROS., INC., Contractor

Statite Plaster Bond No. 3—A black compound for application to masonry wall surfaces of all kinds, so as to form a dampproofing and bond for plaster (not portland cement mortar). It eliminates furring and lathing. Apply by brush or spray. *Note: do not use for concrete walls or ceilings.*

Covering Capacity—Approx. 75 sq. ft. per gal. 1 coat; 50 sq. ft. 2 coats.

Marine Cement No. 3A—A black compound of heavy consistency for dampproofing exterior foundation walls below grade, also for application to floor slabs of ground floors, gymnasiums, etc. Applied cold with brush or spray.

Covering Capacity—Approx. 60 sq. ft. per gal. 1 coat; 40 sq. ft. 2 coats.

Stone Backing No. 3B—A black compound for dampproofing unexposed surfaces of cut stone and for rustproofing roofing metal surfaces. It is applied just as it comes from the container.

Covering Capacity—Approx. 125 sq. ft. per gal. 1 coat; 75 sq. ft. 2 coats.

Mastic Insulite Cement No. 4—A black mastic for waterproofing foundations, walls, tunnels, etc., against heavy water pressure; for overcoating, caulking and patching old roofs, ceiling cracks, open joints, etc. Applied cold (with trowel) ⅛ to $\frac{3}{16}$ in. thick according to the smoothness of the surface. When set, it has the consistency of hard rubber, never gets brittle and is unaffected by changes in temperature. Very elastic and adhesive; works freely.

Covering Capacity—Approx. 15 sq. ft. per gal. ⅛-in. thickness 8-10 sq. ft., ¼-in. thickness trowel coat.

Semi-Mastic—A heavy bodied bituminous coating containing long staple asbestos fibre to produce a brush coating of definite thickness. For the dampproofing of masonry walls and floors above and below grade. Can be used on all masonry surfaces, but not concrete, nor can it be applied to ceilings.

Covering Capacity—Approx. 30 sq. ft. per gal. 1 coat. 20 sq. ft. per gal. 2 coats.

Emulsified Asphalt—Pure unadulterated asphalt scientifically emulsified so that it may be used cold and without heating when mixed with aggregate for repairing cement floors, all roads and by itself as a bonding and waterproofing agent.

Covering Capacity—Approx. 75 sq. ft. per gal. 1 coat; 50 sq. ft. 2 coats.

Asphalt Primer—A liquid asphalt undercoating which will provide a foundation bond between structural elements and other bituminous materials to be applied thereon. Penetrates deeply. Apply cold with brush on dry surface.

IRONCO NON-SHRINK AGGREGATE AND BONDING IRON

For bonding top finish and hardening concrete slab, patching and resurfacing old concrete floors, correcting concrete disintegration and surface spalling, interior and exterior, honeycombs and grouting bridge seats, rails, etc. Ironco increases strength 50%, eliminating shrinkage and checking of gunned concrete; and it resists abrasive and corrosive agents.

Specifications—Ironco is an aggregate to be combined with cement gravel and sand in the following proportions (by weight): 1 part cement, 1 part clean sharp sand, 1 part Ironco where clearance is 1 in. or less, or 1 part cement, 1 part clean sharp sand, 1½ parts ¼-in. pea gravel, 1 part Ironco. For concrete pipe joints, 2 parts cement, 3 parts sand, 1 part Ironco. To any of these mixes, after turning it over enough times dry to insure the even distribution of aggregates and cement, add enough clear clean water to make the mix placeable, and in all cases avoid excess of water.

FLOOR HARDENERS

Iron-Clad Crystals No. 7B (Surface Treatment)—These crystals are dissolved in water, and applied to the concrete surface with a stiff brush or broom in two coats of equal strength for wearproofing, waterproofing and dustproofing of same.

Covering Capacity—Approx. 2 lbs. will treat 100 sq. ft. surface 2 coats.

Iron-Clad Liquid Floor Hardener (Surface Treatment)—A powerful chemical in liquid form mixed with water. Flush over concrete floors—work into floor by sweeping. Combines with free lime and other elements in the cement. Forms new compounds which add considerable density and hardness to the surface. Apply to old and new floors.

Specifications—1 gal. per sq. ft. 2 coats.

Duro-Mix Integral Liquid Floor Hardener—A liquid added to water used in mixing cement top coat for wearproofing, waterproofing and dustproofing light duty and commercial floors. Adds to plasticity and density, increases strength and resistance to wear.

Specifications—Use 1 gal. per 100 sq. ft. top coat 1:2 mix, or add 1 qt. per bag cement.

Durocon Metallic Floor Hardener—A chemically treated all-ferrous water absorbent metallic hardener containing Ocon which gives advantages of low water-cement ratio, and provides a concrete of increased strength, resisting acid, alkali, etc. Easy to finish and free from dusting and crazing. Furnished in natural, gray, red, brown, or green. Also non-slip. Detailed specifications upon request.

Hotel Breakers, Palm Beach, Fla.

After exhaustive tests AQUABAR CLEAR COAT No. 2 Colorless Waterproofing Liquid was selected to waterproof exterior walls of entire structure against hurricane driving rains, high winds, etc.

QUICK-SET ANTI-FREEZE AND ACCELERATOR

This liquid is added to water used in mixing mass concrete cement mortar, etc., for accelerating the set to prevent freezing. Causes rapid evaporation of the water, and speeds final set, permitting work to continue in temperatures as low as 20° F.

PRESERVO WOOD FLOOR PRESERVATIVE

A translucent liquid for preserving and dustproofing maple and yellow pine floors, without changing appearance of the surface. It prevents rotting and decay, and adds to wood those essential elements for preserving its life and appearance.

Covering Capacity—Approx. 350 sq. ft. per gal. 1 coat; 250 sq. ft. 2 coats, depending upon porosity.

FLOORTEX CONCRETE PRESERVATIVE

A moderately viscuous amber liquid of non-volatile synthetic base which when applied to any dry concrete surface penetrates and fills the pores with a waterproof corrosive resistant. Recommended for application to all concrete exposed to severe corrosive conditions such as floors in manufacturing plants, silos, tanks, vats, bottling plants, etc.

PAINTS

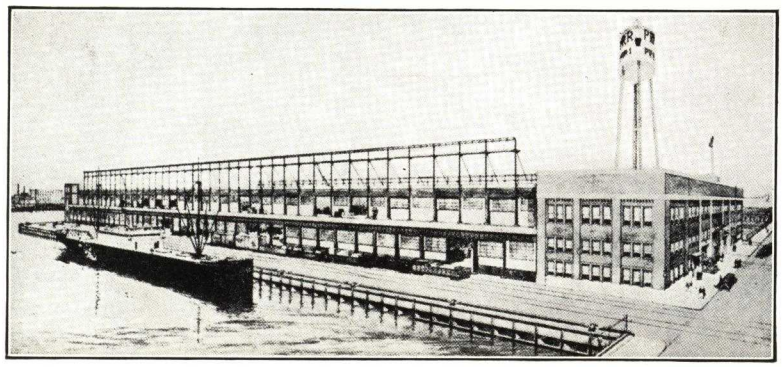
Conco Cement Floor Paint—For protecting and decorating cement floors above or below grade, prevents dusting and disintegration, absorption of oils, greases and other foreign matter; is extremely durable, and resists wear to a remarkable degree. Light gray, lead, olive green, red brown and rust.

Covering Capacity—Approx. 250 sq. ft. per gal. 1 coat; 150 sq. ft. 2 coats.

Cementex Cement Paint—Cement paint in powder form for use over concrete, stucco and other virgin masonry surfaces, outside or inside. Adheres firmly—giving a waterproof decorative and lasting finish. Excellent for swimming pools, laundries, interior or exterior wet or dry surfaces. Made in various colors.

Covering Capacity—9 lbs. and 3 qts. water will make 1 gal. which covers approx. 100 sq. ft. 2 coats.

Elasticote No. 6 Waterproof Paint—A highly specialized liquid cement coating for waterproofing and dampproofing exterior and interior concrete, brick, cinder



Import Pier No. 1, Pennsylvania R. R., Canton, Baltimore, Md.

A. R. WILSON, Engineer of Bridges (P. R. R.) SINCLAIR & GRIGG, Contractors

Nearly half million square feet of Durocon-built floors

block, stucco, plaster and masonry walls. Gives a handsome appearance and offers excellent wearing qualities. Made in various colors. Recommended for swimming pools.

Covering Capacity—Approx. 150 sq. ft. per gal. 1 coat; 100 sq. ft. per gal. 2 coats.

AQUATEX ELASTIC CAULKING COMPOUND

For the caulking of window and door frames, pointing masonry and terra cotta joints and flashings of all kinds. A plastic material composed of weatherproof, waterproof and elastic bonding oils and gums, properly reinforced to permanently fill interstices and remains elastic and unaffected by weather. Absolutely stainproof. Gum or knife consistency in all colors.

MORTARON SHRINKPROOFING PLASTICIZER

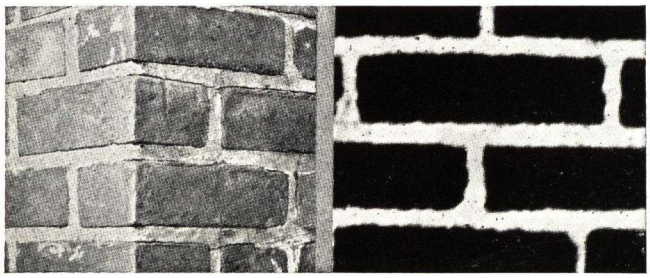
For Masonry Mortar (Liquid or Dry)

Architects and builders agree that shrinkage of mortar which results in cracks between mortar and brick is the main cause of leakage. All mortars shrink excessively during first 24 to 48 hours before a strong bond is formed between mortar and brick. Shrinkage occurs regardless of whether patent masonry, cement or lime mortars or a combination of cement and lime are used, waterproofed or otherwise.

Shrinkage is inevitable in any mortar mix because more than twice as much water is required to provide workability than is needed to hydrate the cement.

Only by reduction of water content without loss of workability can shrinkage be checked.

Reduces Shrinkage—Mortaron produces an ideal workable mortar with much less water and reduces shrinkage appreciably or below the critical point at which it breaks the bond.



Without Mortaron
Shrinkage Cracks—Leaky Walls

With Mortaron
Check Shrinkage—Perfect Bond

Increases Plasticity—Not only does Mortaron retain required workability with less water; it actually increases it. The gelatinous properties of Mortaron so increase plasticity that the mason must automatically reduce water or add sand, or both to obtain proper consistency.

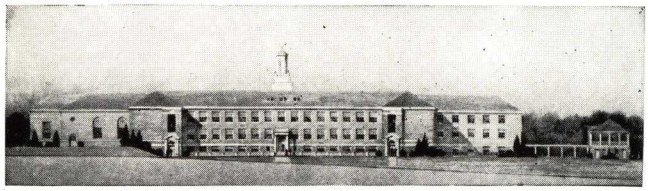
Ellis Hospital, Schenectady, N. Y.
All face brick and backing shrinkproofed with Mortaron
Heacock, Hokanson & Scheuringer, Architects
James E. Lowe & Sons, Inc., Contractors
C. O. Struse & Sons, Brick Masons

Checks Efflorescence—The puzzolanic action of Mortaron reduces soluble salts which cause efflorescence originating from the mortar.

Reduces Water Absorption — Mortaron assists bond, checks capillary action and renders pores more water repellant.

Improves Adhesion—The puzzolanic effect of Mortaron increases the extent of bond.

Increases Strength—Greater density resulting from reduced water-cement ratio increases bond, shear and compressive strengths of mortar.



High School, Wyomissing, Pa.
Muhlenberg Brothers, Architects. Edward A. Reider, Contractor
Frank H. deTemple, Masonry Contractor
All exterior masonry walls shrinkproofed with Mortaron

Shrinkage of Fresh Mortar—Shrinkage takes place during setting and early hardening period of the mortar. No appreciable shrinkage takes place after twenty-four to forty-eight hours.

MORTARON SHRINKAGE TESTS

E. L. CONWELL & CO., PHILADELPHIA, PA.
Nos. 230791-2-3

Mix	Shrinkage in Inches Specimens 3" (Diameter) x 60" (Original Height)	Bond Strength	Compressive Strength Specimens 3" x 6" Cylinder	
	48 Hours	28 Days	7 Days	28 Days
1:1:6 Plain	0.756**	33.0*	802*	998*
1:1:6 **With Mortaron**	0.720	36.8	825	1093
1:3 Plain	0.686	41.8	1779	2405
1:3 **With Mortaron**	0.612	46.0	1864	2598

Average of three specimens. **Decrease in height. *Pounds per square inch.
Materials Used: Samples of standard brands of cement and hydrated lime, etc.
Admixture added at the rate of 1 qt. per bag cement and 1 qt. per bag lime.
Mortars in comparison contained equivalent quantity of water, including the liquid content of the admixture.
Special Note—3-in. (diameter) x 60-in. (original height) cylinders used to check actual shrinkage in comparison far more accurate and practical than 2x4 or 3x6-in. cylinders.

Note: All mixtures and tests as shown were devised by the Conwell Testing Laboratory. No one connected with our Company was permitted to interfere or make suggestions to the Testing Laboratory. We desired to present to the Architectural and Engineering profession the true advantages to be gained by the use of Mortaron Shrinkproofing as seen by absolutely disinterested parties.

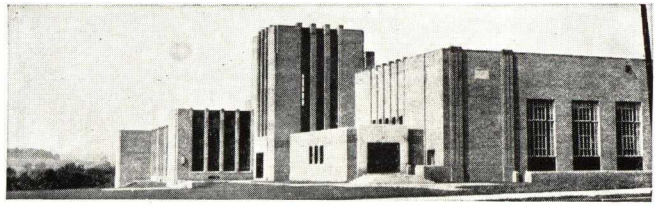
Checking the report you will note Bond Strength for 28 days shows considerable gain in strength of mortar when it has Mortaron in it. It is that characteristic which prevents masonry work breaking loose from the joint, allowing water to enter, and permitting disintegration to start and to continue. This gain in strength, considered in connection with the fact that Mortaron Shrinkproofing really does reduce shrinkage to an appreciable extent, is of material value.

Specifications—(Liquid Form)—Mortar for all exterior exposed brick, backup tile or stone walls, full thickness of the wall, shall consist of 1 part cement, 1 part slaked lime putty, 6 parts sand — 1:2:7 — 1:3 (or other mixes as designated) or approved masonry cements, to which shall be added Mortaron Shrinkproofing in the proportions of 1 qt. per each bag cement and/or each bag lime.

Charity Hospital, New Orleans, La.
Mortar for all exterior masonry walls and backing shrinkproofed with Mortaron
Weiss, Dreyfous & Seiferth, Architects
George A. Fuller Co., Contractor
C. O. Struse & Sons, Brick Masons

(Powder Form)—Mortaron Shrinkproofing shall be added to the mortar in the proportions of 2 lbs. per each bag cement and/or each bag lime.

Should patent masonry mortar be used instead of cement and lime, Mortaron to be added in same proportion as above stipulated.



Senior High School, Norristown, Pa.
2,000,000 brick shrinkproofed with Mortaron. Entire substructure waterproofed with Integral Compound No. 1. Durocon used in concrete floors
Davis & Dunlap, Architects. Ralph S. Herzog, Contractor

DURACRETE FOR DURABLE CONCRETE (Liquid or Dry Form)

Is an integral water reducing agent and puzzolanic plasticizer which automatically reduces the amount of water required to produce a plastic workable concrete mix.

The amount of water in concrete required to hydrate the cement is small compared with the quantity required to make it workable, therefore if the amount of placing water is reduced the water cement ratio, which governs the strength and durability of concrete, is also reduced, resulting in a concrete with more strength, greater durability and density and less shrinkage.

The excess water required for placing concrete evaporates during the process of curing, which causes porosity and shrinkage, therefore if the amount of placing water can be reduced and the workability maintained by the use of DURACRETE a concrete with less absorption and shrinkage and greater density and water tightness is produced. The porosity of concrete is in direct proportion to the space left unoccupied by the evaporation of water.

Because of the puzzolanic nature of DURACRETE it readily combines with the free lime (calcium hydroxide) liberated during the hydration of cement resulting in a concrete with greater resistance to corrosion and disintegration due to alternate freezing and thawing.

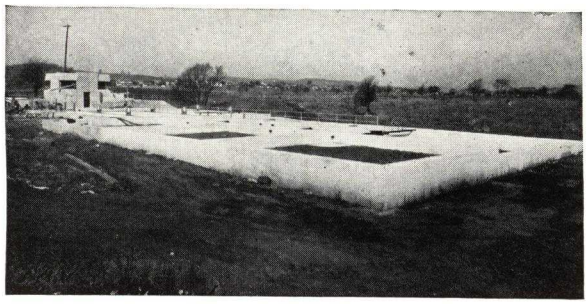
The workability of concrete is the measure of effort necessary to place or move concrete in the forms and around reinforcing steel, therefore DURACRETE, which increases workability, permits the concrete to be placed with less labor and manipulation, resulting in lower placing costs. Concrete with DURACRETE can be handled in chutes and pumped through pipes with less water and a considerable reduction in frictional resistance. Concrete with DURACRETE produces a smooth surface, free from honeycombing after the forms are stripped, reducing surface finish cost. The cost of DURACRETE is usually offset by reduction in labor costs of placing and finishing.

Concrete with DURACRETE has uniform consistency due to the fact that its cohesive quality reduces segregation of the aggregates. DURACRETE increases workability 100% without any increase in water in mixes whose slumps are 3 in. or less.

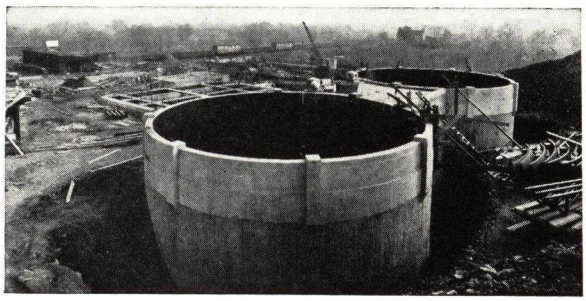
Specifications—Liquid DURACRETE shall be added to concrete mixes in the proportion of 1 gal. per cu. yd. of concrete. The volume of water in all cases shall be reduced by not less than the volume of DURACRETE added to the mix.

Specifications—Dry DURACRETE shall be added to concrete mixes in the proportion of 2 lbs. per sack of cement.

Special Note: Dry DURACRETE will not absorb water and become plastic when exposed to the air, but will remain in dry, powder form.



Sewage Disposal Plant, Boyertown, Pa.
WILLIAM H. DECHANT & SONS, Engineers
THOMAS PROCTOR CO., Contractors



Sewage Disposal Plant, Phoenixville, Pa.
ALBRIGHT & FRIEL, Engineers
THOMAS PROCTOR CO., Contractors

TEST SHOWING IMPROVED WORKABILITY BY USE OF DURACRETE

	Gals. water per sack of cement		Slump in in.	Design strength 28 days	Tested strength 28 days
	Net	Gross			
Plain concrete	4	5½	3	3500	3800
	4.2	5½	2¾	3500	3750
	4.1	5½	1¾	3500	3820
Average			2½		3790
Same concrete with Duracrete	3.9	5½	6½	3500	4310
	3.9	5½	5	3500	4030
	3.9	5½	4½	3500	3860
Average			5⅓		4067

Workability by slump test increased 113% over plain mix.

E. L. Conwell & Co. Laboratory tests—Sewage Disposal Plant, Phoenixville, Pa.

COMPARISON OF WORKABILITY

Average of 6 batches	Cement lbs.	Sand surface, dry lbs.	Stone surface, dry lbs.	Water, lbs.	Admixture (c.c.)	Water cement ratio, gals. per sack	Slump, ins.
Plain concrete	5.78	13.78	17.11	3.381	None	6.60	4.9
Concrete with admixture added* Water decreased 15%	5.78	13.78	17.11	2.791	37.8	5.61	4.8

*AQUABAR DURACRETE added in accordance with manufacturer's directions.

COMPARISON OF SLUMPS WITH THE SAME AMOUNT OF WATER

Average of 5 batches	Cement, lbs.	Sand surface, dry lbs.	Stone surface, dry lbs.	Water, lbs.	Admixture (c.c.)	Water cement ratio, gals. per sack	Slump, ins.
Plain concrete	5.78	13.78	17.11	3.227	None	6.3	1.7
Concrete with admixture added	5.78	13.78	17.11	3.144	37.8	6.3	6.7

(Workability increased 294%.)

CONCLUSIONS (By Testing Laboratory)

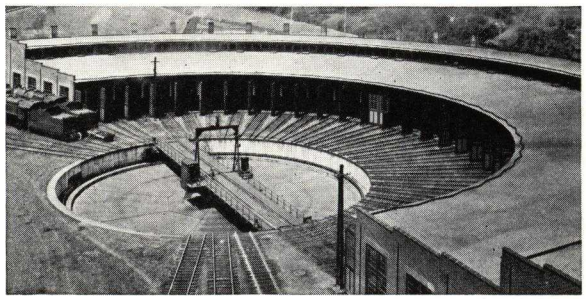
The concrete containing the admixture has approximately the same slump as the plain concrete, notwithstanding a decrease of 15% in the total water in the former.

The concrete containing the admixture and 15% less total water has a slightly higher seven-day compressive strength than the plain concrete. The seven-day compressive strengths of both concretes are higher than that indicated in most established water-cement ratio curves for Portland cement concrete.

Batches of concrete fabricated with the admixture showed slump increases in excess of 100% more than that of batches of plain concrete containing the same water-cement ratio. (294% increase.)

Partial List of DURACRETE Installations

American Viscose Co., Front Royal, Va. Ballinger Co., Engrs.
Sewage Disposal Plant, Boyertown, Pa. Wm. H. Dechant & Sons, Engrs.
Sanitary Trunk Sewers, Allentown, Pa. Earl Meckley, City Engr.
Incinerator, Lower Merion Township, Pa. Albright & Friel, Engrs.
Sewage Treatment Plant, Clarks Green, Pa. Albright & Friel, Engrs.
Filtration Plant, Mansfield, Pa. Wm. H. Dechant & Sons, Engrs.
Filtration Plant, East Greenville, Pa. Albright & Friel, Engrs.
Penna. Railroad Locomotive Pits, Enola, Pa. A. R. Wilson, Engr. of Bridges
24½ Street Bridge, Altoona, Pa. H. J. Baum, City Engr.
Evans Crematory, Reading, Pa. Muhlenberg & Shenk, Archts.
Elementary and Junior High School, Camden, N. J. B. H. Edwards, Archt.
Washington School, Trenton, N. J. P. L. Fowler Co., Archts.
School, Waldwick, N. J., G. Nordham, Archt.
Armory, Ligonier, Pa. R. H. Brocker, Archt.



Penna Railroad Engine Facilities, Harrisburg, Pa.
A. R. WILSON, Engineer, Bridges and Buildings
MCCLOSKEY & CO., Contractors

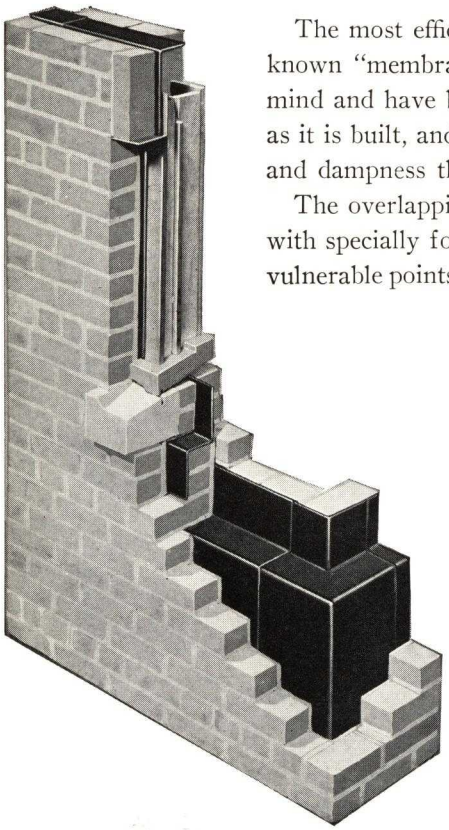
DURACRETE used in all concrete on above structures.

BRISK WATERPROOFING CO., INC.

Specialists in Preventive and Remedial Waterproofing
Appliers of Larson Pre-Formed Waterproofing Units

103 Park Avenue, NEW YORK, N. Y.
REPRESENTATIVES IN BOSTON, PHILADELPHIA AND WASHINGTON

LARSON PRE-FORMED WATERPROOFING UNITS



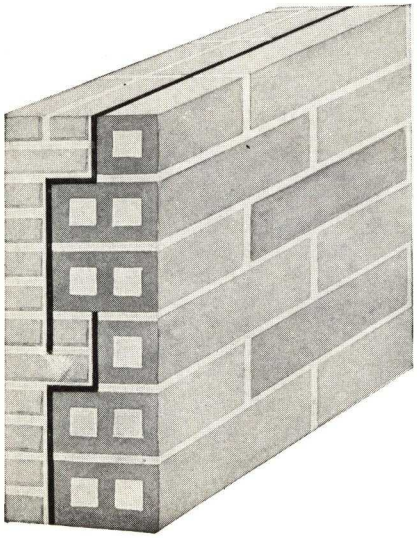
External Corner Showing Sill and Lintel Protection

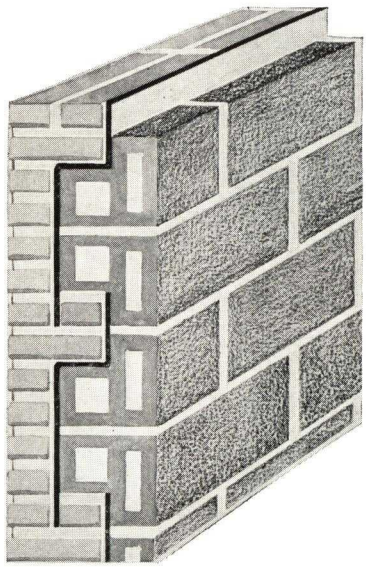
The most efficient way of waterproofing, even against considerable pressure, is by the well-known "membrane method." Larson Waterproofing Units have been developed with this in mind and have been designed in such a way as to be easily and quickly laid in the brickwork as it is built, and sealed within it. The result is a continuous membrane barrier against water and dampness throughout the entire wall area and around all openings for doors and windows.

The overlapping joints are completely sealed as they are laid, and all corners are provided with specially formed units to insure a continuous seal locked to the standard wall units at these vulnerable points.

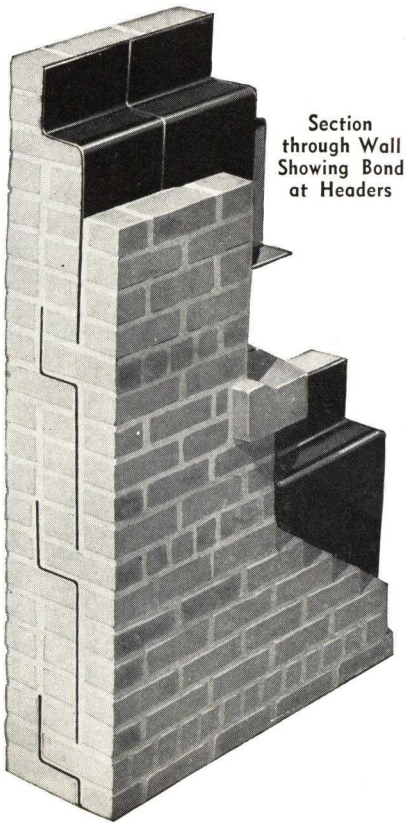
CHECK THESE TEN IMPORTANT FEATURES

(1) Provides a permanent membrane sealed within the wall.
(2) Complete protection from foundation to roof.
(3) Structural steel, pipes and conduits completely sheathed.
(4) Entire perimeter of windows flashed.
(5) Pre-formed to correct size and shape.
(6) System sealed to roof flashings.
(7) Adaptable to all bondings, brick or block back-up, and all architectural features.
(8) Strength of wall not affected.
(9) Limits penetration of water to outer 4 inches of wall.
(10) Installed and guaranteed by the BRISK WATERPROOFING CO., INC.





Units Used with Various Types of Cinder Concrete, Cement or Terra Cotta Blocks



Section through Wall Showing Bond at Headers

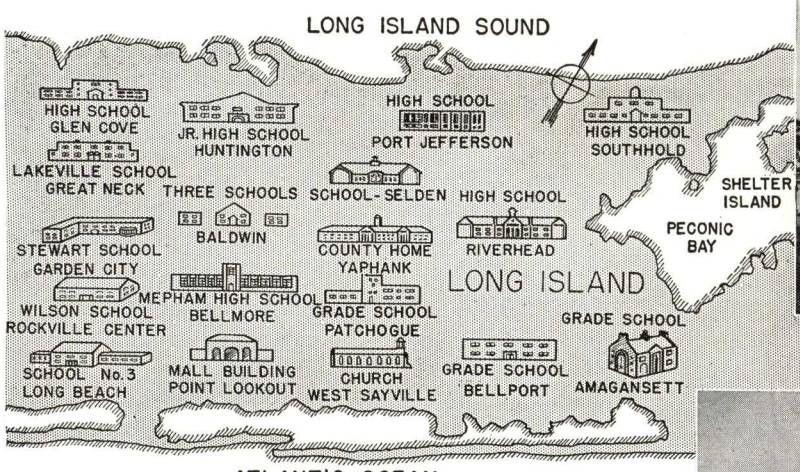
The Larson System Keeps Buildings Dry in Hurricane

On September 21, 1938, a hurricane of unprecedented intensity struck Long Island. Many of the buildings directly in the path of this storm had been waterproofed by means of Larson Pre-Formed Waterproofing Units. An immediate survey was made of these buildings by our engineers. In no case was there any leakage in the walls protected by Larson Units. The location of the buildings is shown in the map below; five of the buildings are pictured.

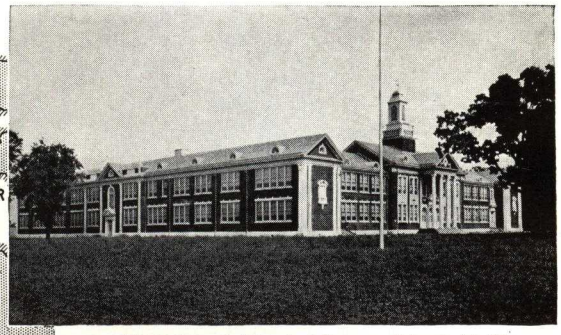
Demonstration to Architects

We have prepared an exhibit demonstrating the advantages and construction details of the Larson System. This consists of photographs, scale models, samples of materials and *a complete motion picture* of the construction of buildings using these units. This exhibit can be seen by any architect at the offices of the BRISK WATERPROOFING CO., INC., 103 Park Avenue, New York City, by appointment — or we will arrange for the exhibit to be shown at the architect's office by our local representative.

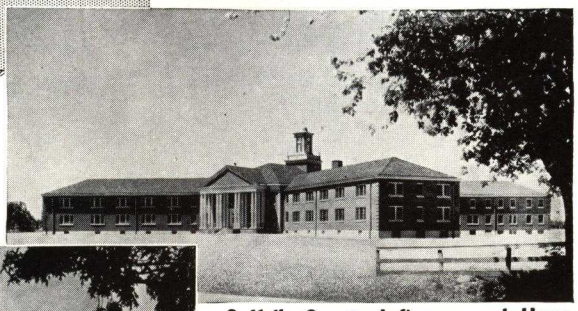
Information as to specifications, unit costs and details of the Larson System may be obtained by writing to our New York office.



The map above shows the portion of Long Island which received the full impact of the hurricane, and indicates the location of important buildings protected by Larson Pre-Formed Waterproofing Units. How these buildings withstood the force of the storm is explained at the top of the page.

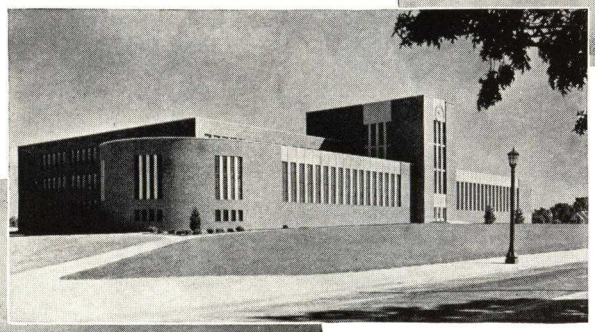


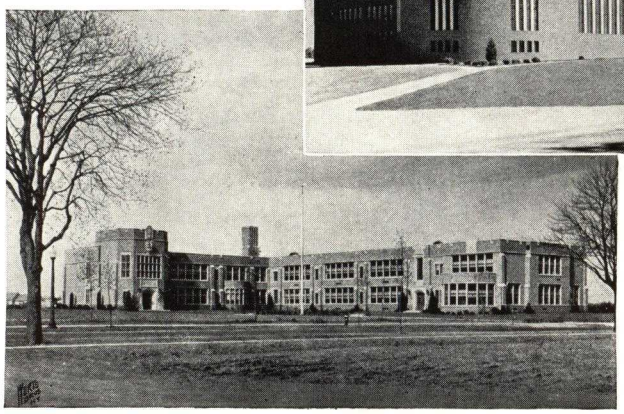
High School, Riverhead, Long Island, N. Y.
WILLIAM LA FON, Architect



Suffolk County Infirmary and Home
Yaphank, Long Island, N. Y.
BISHOP & METCALF, Architects

Right:
W. C. Mepham High School
Belmore, Long Island, N. Y.
FREDERIC P. WIEDERSUM
Architect

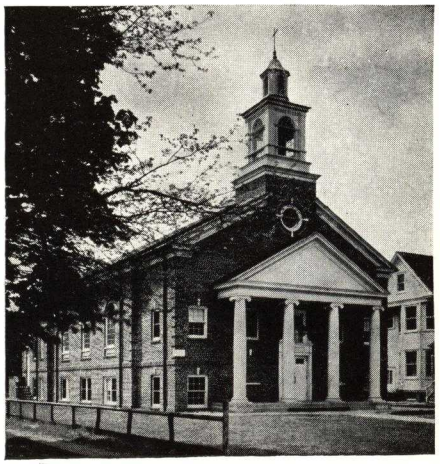




Left:
Stewart School
Garden City East,
Long Island, N. Y.
TOOKER & MARSH, Archts.

Right:
First Reformed Church
West Sayville,
Long Island, N. Y.
LESLIE M. DENNIS, Archt.

Photos by Wurts Bros.
New York City



SAMUEL CABOT, INC.

Clear Brick and Cement Waterproofings for External Application

141 Milk Street, BOSTON, MASS.

For Branch Offices and Agents, see our pages on Stains and Collopakes

For Cabot's Shingles, Stains, Insulating "Quilt," Collopakes (for every paint use), Wood Preservatives, see File Index

PRODUCTS DESIGNED TO WATERPROOF BRICK, STUCCO, CEMENT, STONE, AND ALL TYPES OF MASONRY ABOVE GROUND LEVEL

CABOT'S CLEAR BRICK WATERPROOFING

For All Red Brickwork, Sandstone, and Similar Dark Surfaces

This material has a record of forty years of satisfactory service all over the country. It is based on a natural water-repellent, a wax created and employed by nature for waterproofing purposes, dissolved in a penetrating solvent that carries the wax deep into the pores of brick or stone and seals them. It gives much better protection than linseed oil—one coat is equivalent to three of the oil—and it goes further and lasts many times as long.

Prevention of Efflorescence—The white efflorescence on brickwork is due to the fact that the bricks absorb rain water. This water dissolves the salts within the brick, and when it dries out, the salts are carried to the surface, where they leave unsightly white stains.

Our Clear Brick Waterproofing stops any moisture from getting into the bricks and therefore prevents efflorescence.

CABOT'S CLEAR CEMENT WATERPROOFING

For Stucco, Cast Stone, Concrete, and Other Light Surfaces

This waterproofing is composed of ingredients isolated from naturally waterproof materials, dissolved in a penetrating organic liquid. It is transparent, and will not darken light surfaces.

Clear Cement Waterproofing fills and seals all the voids and pores in cement and stucco walls. Even on the roughest surfaces, it blocks up every hole, and since it is not an integral waterproofing, but is applied after the wall is finished, it seals all cracks and joints as well.

More than twenty years of actual trial in the field have thoroughly proved the worth of this Waterproofing.

South Shore Hotel, South Shore Drive, Chicago, Ill.
Waterproofed with Cabot's Clear Brick Waterproofing

Cabot's

Clear Brick and Cement
Waterproofings

Samuel Cabot Inc

ARCHITECT'S SPECIFICATIONS FOR APPLICATION OF CABOT'S WATERPROOFINGS

Cabot's Clear Brick Waterproofing

All exterior red or dark brick walls, or sandstone, including joints, shall be waterproofed with Cabot's Clear Brick Waterproofing. Apply only to structurally sound, clean, dry surfaces with a brush, like paint, or with a spray gun. Two coats are usually sufficient but not more should be applied than the brick and joints will absorb, and no coating should remain on the surface.

Covering Capacity—One gallon will cover from 200 to 300 sq. ft., two coats, on common brick of average quality, and from 300 to 400 sq. ft. on face brick.

Prevention of Efflorescence

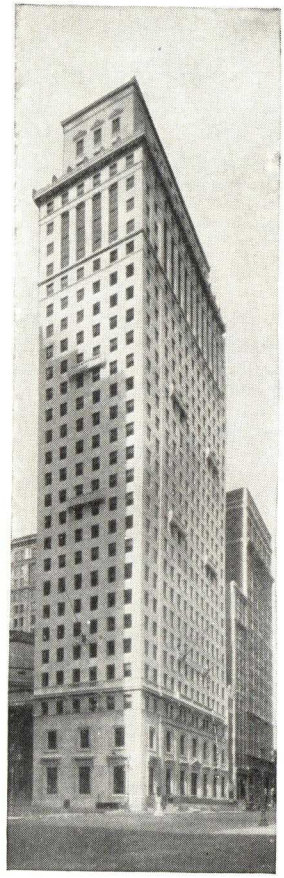
All brick walls, on which efflorescence of salts or mortar stains have appeared, shall be washed with a weak muriatic solution, following which the surface shall be rinsed with clean water and allowed to dry. Cabot's Clear Brick Waterproofing shall then be applied with a brush like paint, or with a spray gun. Only as much waterproofing shall be applied as is necessary to fill all the pores and no coating should remain on the surface.

Cabot's Clear Cement Waterproofing

All exterior (concrete) (caststone) (stucco) (limestone) (light colored brick) surfaces, including joints, shall be waterproofed with Cabot's Clear Cement Waterproofing. Apply only to structurally sound, clean, dry surfaces with a brush, like paint, or with a spray gun.

Only as much waterproofing shall be applied as is necessary to fill all pores, and no more; but, if the surface is not uniform and some parts are more porous than others, care should be taken to apply sufficient waterproofing to fill all places. No coating should remain on the surface.

Covering Capacity—One gallon will cover from 200 to 300 sq. ft., two coats, on smooth concrete, brick or stone, and from 100 to 200 sq. ft., two coats, on stucco or rough cast, depending upon character and condition of the surface.



Girard Trust Company Building, Philadelphia, Pa.
McKim, Meade & White, Architects
Cabot's Clear Cement Waterproofing used on all ornamental cast-stone parapet embellishments

CALBAR PAINT & VARNISH COMPANY

Manufacturers of Technical Paints, Caulking and Glazing Compounds

FACTORY AND EXECUTIVE OFFICE
2612-26 North Martha Street
PHILADELPHIA, PA.

Products

CALBAR "CAULK-O-SEAL" (Reg. U. S. Pat. Off.), NON-STAINING CAULKING, POINTING and GLAZING COMPOUND.

Also Calbar Industrial and Technical Coatings and Finishes.

Calbar Caulk-O-Seal Non-staining Caulking, Glazing and Pointing Compound

The necessity for a material having an elastic nature for sealing cracks, waterproofing and glazing, prompted us some years ago to devote a large amount of time, money and effort to produce a product that would fill every requirement for varying conditions. After several years of constant experiments and gradual improvements we developed a compound which was considered the acme of perfection. Time has proven that our product is just right. Each feature has been carefully tested and we offer those, who are interested in a caulking compound of exceptional merits, Calbar Caulk-O-Seal Plastic Compound.

The saving of fuel from air leakage is an economic necessity. Heating, ventilating and air conditioning of buildings can not be controlled while there are cracks around doors and windows and other openings where air in unregulated amounts can enter. Of course, there are other things to consider also. Such openings allow dirt, dampness and deterioration to get in their work. It is well recognized at the present time that all buildings, from the modest two-story home to the highest skyscraper, require caulking. The cost is low and the benefit is great.

Caulk-O-Seal—Permanently Plastic Compound

Caulk-O-Seal is a permanently plastic compound that is impervious to heat, cold, moisture and fumes. It dries with a tough surface hide which can be painted over without bleeding through. Beneath the surface it remains plastic and pliable for years, taking up expansion or contraction of adjoining surfaces. Vibration does not harm it. It is strictly a waterproof product. It adheres firmly and tenaciously to any surface, whether glass, marble, tile, brick, concrete, wood, steel, limestone, etc.

Caulk-O-Seal—Non-staining Compound

Caulk-O-Seal is a truly *non-staining* compound. This feature is of extreme importance and we suggest that it be considered carefully. It will not stain the surrounding surface adjacent to the place applied. This is a distinctive feature of our product and worthy of consideration. Many beautiful buildings, of limestone and marble construction principally, have been marred by the use of a compound which exudes liquid. The liquid is required as it is the life of the compound. If it bleeds out, its life is lessened. It will be a revelation to you to make a few simple tests with Caulk-O-Seal. Samples will be furnished to demonstrate its *non-staining* quality.

Method of Application

The method of application advocated by us is by the use of a hand caulking gun. We furnish a light, powerful gun, easily operated and capable of developing a high pressure. Caulk-O-Seal is the proper consistency and is easily forced to the required depth in an opening. A canvass of caulking contractors proves conclusively that the use of a hand gun saves labor costs and does the work properly, making a smooth, even, exterior finish. Air pressure guns available if preferred.

Caulk-O-Seal—Gun Grade or Knife Grade

Caulk-O-Seal is supplied in Gun Grade (for use with caulking gun) and in Knife Grade (for use with a putty knife or caulking tool). Made in white, gray, limestone, buff, natural, green, red, maroon and black. Special colors made to order in any quantity. Packed in all sized convenient containers. One gallon of Gun Grade will caulk about 150 lineal feet of an opening, ¼ in. wide and ½ in. deep. Seventeen lbs. of Knife Grade is equivalent to one gallon of Gun Grade.

Caulking Around Window and Door Frames

In new construction, it is recommended that the compound be applied between the frame proper and the masonry. When spaces are deeper than ½ in., they should be packed within ½ in. of the surface with oakum and the remaining space completely filled with Caulk-O-Seal. The staff bead is then put in place.

Pointing Stonework, Terra Cotta, Copings, etc.

All joints should be raked back to a depth of ½ in. and filled in with Caulk-O-Seal.

Glazing

For embedding and glazing glass in wood or metal sash or skylights, use the same as putty. The elasticity of Caulk-O-Seal prevents glass from breaking due to vibration or contraction and expansion.

Guarantee

Caulk-O-Seal when applied as directed under usual conditions will give exceptionally satisfactory service and last for a number of years. Many installations are still in perfect condition after ten years.

References

Many important buildings have been caulked with Caulk-O-Seal, including schools, hospitals, apartment houses, churches, public buildings, hotels, United States Government buildings, and industrial plants.

Contractors approved by us are available in principal cities of the United States.

CERESIT WATERPROOFING CORPORATION

Manufacturers of Waterproofings, Dampproofings, Concrete Floor Hardeners and Other Protective Products

GENERAL OFFICES AND FACTORY

512 South Canal Street, CHICAGO, ILL.

SALES REPRESENTATIVES AND WAREHOUSE STOCKS IN ALL PRINCIPAL CITIES

Ceresit Waterproofing Compound

The use of integral waterproofing provides a practical, economical, and thoroughly successful method of securing positive waterproofness in Portland cement mixtures.

Ceresit Waterproofing Compound is the original waterproofing paste developed in 1909. It is still made from the original formula, modified, refined and concentrated. Ceresit has been used internationally for over a quarter century.

It waterproofs, densifies, and lubricates concrete. Produces a "fatty" mix, thus increasing workability to a marked degree. It makes concrete flow more easily through chutes and forms and around reinforcing. Permits a noticeable reduction in the water content which adds to the strength and increases the density. Has no chemical reaction with the cement. It mixes easily with the water which makes its use a simple operation without adding to labor costs.

Quantity Required—6-8 lbs. per cu. yd. of concrete. 6-8 lbs. per 100 sq. ft. of cement mortar or cement floor finish, 1 in. thick. 1 pt. weighs about 1 lb.

Ceresit Waterproofing Liquid

Contains the same basic waterproofing elements as the paste. Made to meet the demand for integral waterproofing of the liquid type.

Quantity Required—1 gal. per cu. yd. of concrete. 1 gal. per 100 sq. ft. of 1-in. mortar.

Ceresit Waterproofing Powder

Performs same waterproofing functions as the paste. Made in powder form for certain classes of work.

Quantity Required—2 lbs. per sack of portland cement.

Cresolac Transparent Waterproofing

A waterproofing and stormproofing liquid for exteriors of stucco, brick, stone and similar materials. Waterproofs effectively without any discoloration.

Quantity Required—100-150 sq. ft. per gal. Applied with brush or spray. Amount required depends upon porosity of surface.

Ceresit Foundation Dampproofing

A black asphaltic paint for waterproofing exterior foundation walls below grade.

Quantity Required—60-75 sq. ft. per gal., 1 coat. 40-50 sq. ft. per gal., 2 coats.

Ceresit Plaster Bond

A black, tacky asphaltic dampproofing and bonding paint applied to walls before plastering.

Quantity Required—60-75 sq. ft. per gal., 1 coat. 40-50 sq. ft. per gal, 2 coats.

CERESIT
TRADE MARK REGISTERED

The prestige of more than a quarter century of successful use stands behind Ceresit products. Through engineering research and actual application in construction and maintenance problems each Ceresit product has been developed to the highest degree of efficiency. Ceresit products are being used in all parts of the United States, Canada, Mexico and many other countries.

Ceresit Metallic Waterproofing

A surface application which can be used after construction is completed. It is of value in waterproofing basements of new as well as existing buildings.

Ceresit Metallic Waterproofing is a pulverized iron compound in powder form with which is combined during the process of manufacture, certain oxidizing chemicals. It conforms to U. S. Government specifications and has been used on many large government projects.

Quantity Required—20-25 lbs. per 100 sq. ft. for walls. 15 lbs. per 100 sq. ft. for floors before cement topping is applied.

Ceresit Metalbond

A metallic binder to assist in bonding new concrete floor toppings, and to provide a waterproof membrane between slab and topping.

Quantity Required—15-20 lbs. per 100 sq. ft.

Ceresit Instant Patcher

A specially processed compound in powder form, which when mixed with water sets hard immediately. Used to stop active leaks, plug bleeder holes, patch masonry and emergency concrete repairs. 10 lbs. fill approximately 150 cu. in. Packed in 10 lb., 20 lb., 25 lb., and 100 lb. sealed containers.

Ceresit Waterproof Patcher

A prepared compound, powder form, for concrete repair and waterproofing work, sets hard in a few hours. Recommended for building cove in leaking basements.

Quantity Required—100 lb. makes approximately 40 ft. of cove.

Overnight Craxement

A metallic patching cement for repairing concrete floors, trucking lanes and similar work. Floors repaired in late afternoon are ready for heavy duty the next morning. Will resist lactic and similar acids. Shipped ready for use.

Craxement can also be supplied in red, brown, and battleship gray colors.

Quantity Required—12-15 lbs. per sq. ft., 1-in. thickness.

Ceresit Metallic Hardener

The application of Metallic Hardener to the surface of new concrete floors is universally recognized as the most practical method of producing wear-resisting concrete. This type of floor will not dust and is waterproof and oilproof. Ceresit Metallic Hardener is manufactured from pure iron properly graded, and is entirely free from oil, grease, and non-ferrous metals. It meets rigid U. S. Government Specifications.

Quantity Required—30 lbs. per 100 sq. ft. medium duty. 40 lbs. per 100 sq. ft. heavy duty. 50 lbs. per 100 sq. ft. extra heavy duty.

Colored Ceresit Metallic Hardener

Regular hardener combined with color, machine mixed. Standard colors are red, brown, battleship gray and green.

Quantity Required—Same as regular Metallic Hardener.

Metalsium

A combination of regular hardener with Silium and other elements to produce a material with puzzolanic properties and having greater resistance to acids and alkalis, as well as added plasticity and workability. Also furnished in colors.

Indurite Liquid Hardener

A chemical solution for surface application to new or old concrete floors. Hardens and dustproofs the surface by chemical reaction. An approved method, in successful use for many years.

Quantity Required—1½ gal. covers 100 sq. ft. 3-coat application.

Indurite Crystals

These crystals dissolved in water produce the liquid hardener described above.

Quantity Required—2½ lbs. per gal. of water, then 1½ gal. of solution per 100 sq. ft.

Crescrete Integral Hardener

A chemical solution for integral use in new cement floor toppings. Gives a wear resisting, non-dusting and waterproof surface. Accelerates the set and increases workability.

Quantity Required—1 qt. in gauging water per sack of cement. Use double quantity for floors subject to lactic or similar acid.

Ceretone Coloring Pigment

A semi-liquid integral hardener and coloring material. Gives a floor of lasting color with a wear-resisting, dustproof and waterproof surface. Made in red, buff, brown, black and green.

Quantity Required—10-16 lbs. in gauging water per sack of cement.

Luxstar Cement Paint

A waterproof decorative cement coating for use on brick, stone, or stucco exteriors, basement walls, swimming pools, etc. White and a wide range of attractive colors.

Quantity Required—10 lbs. mixed with water covers 250 sq. ft. for 1 coat; 150 sq. ft. for 2 coats.

THE ELATERITE PAINT & MANUFACTURING CO.

Waterproofing and Bonding Materials

DES MOINES, IOWA

DISTRIBUTORS

EASTERN OFFICE: Geo. J. Benziger, 33 E. 20th St., New York, N. Y.—Algonquin 4-9084

BUTTE, MONT., Archie Adams, 618 Metals Bank Building
CHICAGO, ILL., Charles L. Brown, 1719 Fisher Bldg.
KANSAS CITY, MO., Stewart Sand & Material Co., 304 City Bank Bldg.—Victor 5920
LOS ANGELES, CALIF., California Stucco Co., 1840 E. 25th St.
MILWAUKEE, WIS., Spray-O-Bond Co., 2225 No. Humboldt Ave.—Locust 4660
OAKLAND, CALIF., R. M. Johnson, 1716 Filbert St.
ST. LOUIS, MO., F. A. Cammann Builders Service Co., 927-28 Century Bldg.—Chestnut 0866
SEATTLE, WASH., F. T. Crowe Corp., 216 Walker Bldg.
WASHINGTON, D. C., Robley E. Dickerson, 1924 Kearney St., N. E.
TORONTO, ONT., CANADA, W. L. Anderson, Terminal Warehouse, 207 Queens Quay

Products

No. 60, DES MOINES ELATERITE for WATERPROOFING and BONDING; No. 65, DES MOINES ELATERITE for STONE BACKING.

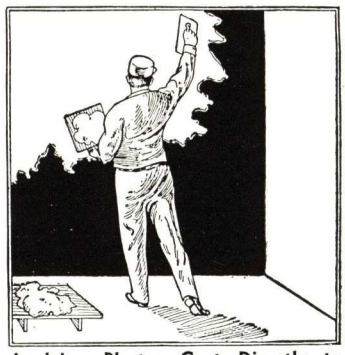
Also manufacturers of Preservative Paints for all classes of surfaces, including Acid and Heat Resisting Paint, Metal Protective Paint, and Waterproofing Gum.

DES MOINES ELATERITE

TRADE-MARK

No. 60, Waterproofing and Bonding

No. 60, Des Moines Elaterite, is both a waterproofing (either membrane or integral) and a bonding material. Its base is elaterite, an intensely adhesive, extremely elastic, non-porous, acid-resisting, absolutely waterproof hydrocarbon, called "mineral rubbers" by geologists. It is mined from true fissure veins extending to great depths and the only deposits of commercial size are located in western United States. Elaterite is entirely distinct from either natural or cut-back asphalts, common to waterproofing materials, and vastly superior.



Applying Plaster Coat Directly to "Des Moines Elaterite" Waterproofing and Bonding Coat

Because of the individual characteristics of this pigment No. 60, Des Moines Elaterite, seals the pores of concrete, cement, brick, tile or stone with an elastic, permanently pliable, rubbery envelope, destroys capillary attraction by its insulating properties and provides a continuous, protecting film which completely shuts out dampness. In addition, its intensely adhesive quality (determined as 295 lbs. by Bureau of Standards of New York City) makes No. 60 an ideal bonding material, permitting direct application over it of plaster or stucco coats and bonding them firmly and permanently.

Advantages—Intensely adhesive, permanent character; extreme resistance to all acids, preventing disintegration; permanent pliability and elasticity, preventing breaking of the waterproof film from hair cracks or expansion and contraction; smooth liquid character, providing a continuous, rubbery blanket; absolute waterproof character, sealing the surface against passage of dampness; combination of waterproofing and bonding, permitting doing away with lath or furring, economizing room and saving in labor and material costs. It meets every waterproofing requirement, thus there is no need to specify a different material for outside foundations, inside walls, bonding or integral waterproofing.

Application—Applied cold, it spreads easily with broad flat brushes or may be applied with air gun. No hot swabbing or layers of felt required and any workman can apply it.

Covering Capacity—100 to 150 sq. ft. (one coat) per gal.; 80 to 100 sq. ft. (two coats) on cement, brick or stone, depending on porosity; 250 to 300 sq. ft. on wood or metal.

Specifications—***(a) For Waterproofing Substructures***—The waterproofing contractor shall apply a waterproof membrane of No. 60, Waterproofing and Bonding, Des Moines Elaterite, manufactured by THE ELATERITE PAINT & MANUFACTURING Co., Des Moines, Iowa, to the outside of all foundation walls to a point 6 in. above grade, including piers, and to be carried over all footings and properly joined to waterproofing course on outside walls. Membrane shall consist of 2 coats properly applied so there shall be no pinholes or uncovered spaces. At least 24 hours must elapse after the application of first coat before applying a heavy second coat, allowing it to dry thoroughly before covering. Walls shall be cleaned thoroughly to remove all loose particles, must be dry and, if of concrete, thoroughly set before applying No. 60, Waterproofing and Bonding, Des Moines Elaterite.

(b) For Dampproofing Interior Walls Which Are to Be Plastered, or for Waterproofing Exterior Walls Which Are to Be Stuccoed—The contractor shall apply 2 coats of No. 60, Waterproofing and Bonding, Des Moines Elaterite, manufactured by THE ELATERITE PAINT & MANUFACTURING Co., Des Moines, Iowa, over the inside surface of all exterior walls which are to be plastered, and outside surface of all walls which are to be stuccoed. The walls shall be clean and dry and the application so made that there shall be no pinholes or uncovered spaces. At least 24 hours must elapse between the application of the first and second coat, which shall be a heavy coat.

Plaster shall be applied directly over the coating of No. 60, Des Moines Elaterite, after the second coat is "set" but while it is still "tacky," though not sooner than 3 hours after the second application, nor longer thereafter than 10 days. Stucco shall be applied directly over the coating of No. 60, Des Moines Elaterite, while it is "tacky," but not sooner than 3 hours after application of the second coat nor longer thereafter than 10 hours.

(c) For Integral Waterproofing Use—All plaster or stucco (or mortar for laying up brick, or cement floor or roof toppings or concrete) to be made waterproof must have No. 60, Waterproofing and Bonding, Des Moines Elaterite, as manufactured by THE ELATERITE PAINT & MANUFACTURING Co., Des Moines, Iowa, incorporated integrally, proportioned either with the water used for tempering or with the quantity of portland cement used in the batch in the following manner:

If proportioned with the water used for tempering it shall be 1 to 8—1 part No. 60, Des Moines Elaterite, to 8 parts water.

If proportioned with the portland cement it shall be 1 gal. No. 60, Des Moines Elaterite, to each 1⅔ bags of portland cement used.

The No. 60, Des Moines Elaterite, shall be added to the mixture in the foregoing proportions after the water has been put in for tempering, and the mixing shall then be continued until there is complete and thorough distribution throughout the mixture. It must not be added to the water before the latter has been put in for tempering the mixture.

For integral mixture in waterproofing concrete which is subject to heavy water pressure the proportion shall be changed to 1 part No. 60, Des Moines Elaterite, to 4 parts water used—1 gal. No. 60 to each 4 gal. of water. The No. 60 to be added after the water has been stirred into the mixture and the stirring continued until there is complete distribution.

No. 65 Stone Backing

Specification — All stone shall be coated, before setting, on the five unexposed sides; also entire inner surface, including joints, shall be coated after the stone is set with No. 65, Stone Backing Des Moines Elaterite, as manufactured by THE ELATERITE PAINT & MANUFACTURING Co. of Des Moines, Iowa.

Protecting Stone Facing from Discoloration with "Des Moines Elaterite"

Prices and References

Sent on request.

ESTABLISHED 1879

THE BILLINGS-CHAPIN CO.

DIVISION OF THE GLIDDEN COMPANY

Manufacturers of Damp-proof Coatings, Paints, Varnishes, Stains and Enamels

MAIN OFFICE AND FACTORIES
11010 Berea Road, CLEVELAND, OHIO

NEW YORK BRANCH, 21-11 44th Avenue, LONG ISLAND CITY

BOSTON BRANCH, 44 Midway Street

A LEADER IN DAMP-PROOFING AND STAIN-PROOFING

For over twenty-five years, Driwal has been the recognized leader in damp-proofing and stain-proofing materials. Specified by prominent architects and used on important buildings, it has always given the most thoroughly satisfactory results. Driwal becomes effective by penetrating into the pores of the material and lining them with an insoluble substance which makes them fully water repellent.

Driwal

TRADE-MARK

Driwal is made in four varieties: Clear, for limestone, sandstone, cast stone and brick; Heavy Bodied Clear, a heavier bodied form of Clear; White, for stucco, brick and concrete; and Black for below grade waterproofing.

Clear Driwal for Stain-proofing and Damp-proofing

Clear Driwal is a colorless liquid which effectively damp-proofs and prevents the staining of limestone, sandstone, cast stone, concrete and brick.

It keeps stone in its natural condition and is entirely safe for use on the lightest colored, finest textured quarry products.

Clear Driwal also retards the absorption by stone of dirt and grime from the atmosphere and materially assists in keeping buildings free from the city's dirt and grime.

Specifications for Stain-proofing— ***New Buildings***—(a) All stone dust must be thoroughly brushed off and the stone dry to a depth of at least ¼ in. before any attempt is made to treat the surface.

(b) All surfaces, except the outside face, of all cut stone shall be given one saturating coat of Clear Driwal, preferably with a flat brush.

(c) After the building has been cleaned and tuck pointed and allowed to dry, the face of the stone shall be given one or two coats (optional) of Clear Driwal, allowing at least one day to elapse between coats.

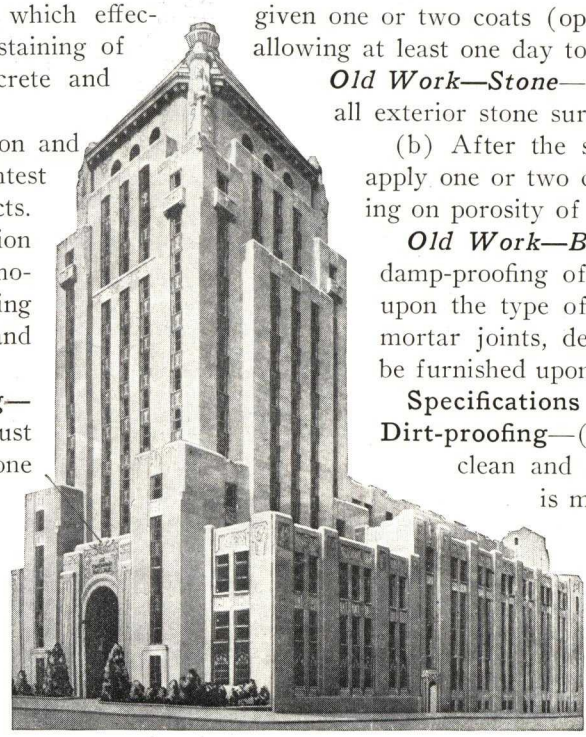
Old Work—Stone—(a) Prior to application, all exterior stone surfaces shall be cleaned.

(b) After the stone is thoroughly dry, apply one or two coats of Driwal, depending on porosity of surface.

Old Work—Brick—As the successful damp-proofing of brick surfaces depends upon the type of brick and condition of mortar joints, detailed specifications will be furnished upon request.

Specifications for Damp-proofing and Dirt-proofing—(a) The surface must be clean and dry before any attempt is made to apply Driwal.

(b) The exterior surface and all joints shall be given two saturating coats of Clear Driwal, applied with a flat brush or spray. At least one day shall be allowed to elapse between coats.



Cincinnati Times-Star Building, Cincinnati, Ohio
SAMUEL HANNAFORD & SONS, Architects
Damp-proofed with Clear Driwal

Heavy Bodied Clear Driwal

This material is a heavier bodied and more concentrated form of Clear Driwal. On all but the most porous surfaces Heavy Bodied Clear will satisfactorily damp-proof in one coat.

It can be used on the same surfaces as the Clear, and becomes effective in the same way.

On highly porous surfaces, where more than the usual number of coats would be required, anyway, Heavy Bodied Clear will fill the pores more quickly and more effectively damp-proof in fewer coats.

Black Driwal

Designed for below-grade waterproofing and supplied in three consistencies:

No. 1, for fairly smooth surfaces
No. 2, for rough surfaces
No. 3, a paste compound for surfaces subjected to heavy pressure

White Driwal

White Driwal decorates at the same time it thoroughly damp-proofs a surface, covering old stains and restoring the original fresh and attractive beauty of stucco and similar surfaces.

White Driwal becomes effective by penetrating into the pores of the surface and can be used on any surface where reasonable penetration can be secured, but should not, of course, be used on previously painted surfaces.

Billings-Chapin-Dri-Coat

Dri-Coat is a white pigmented damp-proof sealer for interior walls and cement floors with the unique quality that it may be applied to interior walls to stop the penetration of moisture from the exterior.

Dri-Coat in most ordinary cases will eliminate moisture trouble, but will not correct serious construction defects where there is water pressure from without.

To Specify—Not to be used over old coats of paints, kalsomine, or enamels. Normally dries hard over night for recoating. Any paint, flat wall, or enamel can be used over it when perfectly dry. Covers approximately 350 sq. ft. per gal., one coat.

Write us for further information.

HETSON-SOMMERS CO., INC.

Manufacturers of Paints and Waterproofings

211 Norman Avenue
BROOKLYN, N. Y.

TELEPHONE
EVergreen 9-4570

PERMANTITE

Products

PERMANTITE CONCENTRATED LIQUID INTEGRAL WATERPROOFING.

WATERPROOFING PAINTS AND COATINGS.

PERMA-SEAL TRANSPARENT DAMPPROOFING.

MASTIC DAMPPROOFING; SEMI-MASTIC DAMPPROOFING; LIQUID and PLASTIC ASBESTOS ROOF COATING; CAULKING CEMENTS; FOUNDATION COATINGS; CEMENT FLOOR HARDENERS and COATINGS; WATERPROOFING FABRICS, FORMX, TECHNICAL PAINTS and VARNISHES; LIQUID TILE.

The Company and Services

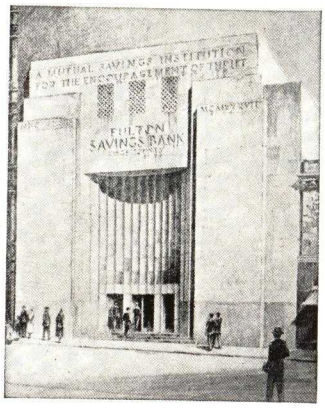
HETSON-SOMMERS CO., INC., during 25 years of close contact with the building trades, have developed an extensive line of dampproofing materials which have earned the recognition of leading architectural and contracting firms.

Our Waterproofing Engineers and Construction Specialists are always available for consultation regarding waterproofing problems. The policy of the Company does not permit recommendation of a stock product when special conditions indicate the need of a special product.

PERMANTITE—THE INTEGRAL WATERPROOFING, HARDENER, ACCELERATOR AND ANTI-FREEZE FOR CONCRETE AND MORTAR

A concentrated liquid to be added to gauging water of concrete and cement mortar. It accomplishes these six important functions when used as specified: (1) It lubricates the mass, resulting in easier and more effective troweling. (2) Materially increases the bonding tendencies. (3) Reduces the freezing point of all cement masses to the minimum. (4) Quickens the set. (5) Permanently waterproofs and hardens the cast; improves the surface. (6) Increases the crushing, tensile and abrasive strength.

The addition of Permantite to concrete also results in decreased porosity, thus increasing resistance to acids and alkalis—an essential in many types of industrial work.



Fulton Savings Bank, 378 Fulton Street, Brooklyn, N. Y.

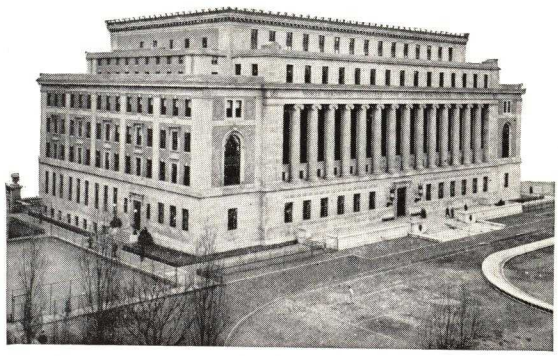
Method of Using—Permantite is poured directly into the mix *after* the gauging water has been added—1 quart of Permantite to each bag of cement. (In hand mixed *cement mortar,* the Permantite is added to the water before mixing—1 gallon Permantite to 17 gallons of water. For concrete, 1 gallon Permantite to 30 gallons water.)

Special Note—Permantite must *never* be poured in a dry mix or used with lime, gypsum plaster or any ready mixed stucco preparation other than Portland Cement Stucco.

TABLE OF PROPORTIONS

One gal. Permatite	
	1 cu. yd., 1-2-4 Concrete Mix
	100 sq. ft., Cement Mortar—1 in. thick
	1000 Brick, 1-3 Mortar Mix
	25 sq. yds., Portland Cement Stucco

Supplied in 55 and 30-gal. drums, 5-gal. pails.



New Library, Columbia University, 114 Street and Morningside Heights, New York City

PERMA-SEAL

A transparent permanent dampproofing for face surface work. Requires no thinners and can be applied with either brush or spray equipment.

SOMMERS MASTIC DAMPPROOFING

An elastic, full bodied, black, slow drying waterproofing compound for inside surfaces of exterior brick or terra cotta walls. Prevents penetration of dampness (either above or below ground), renders walls verminproof and stainproof. Compounded for *trowel* application. Provides a perfect bond surface for gypsum plaster. Impervious to high or low temperature.

Semi-mastic—Same characteristics as Mastic but for brush application where troweling is not practical.

LIQUID TILE FOR FLOORS

A hard but not brittle floor finish based on bakelite type resins. It is more permanent than paint, dries to a high gloss finish in four hours, and is impervious to either acid or alkali.

Liquid Tile is designed for exceptional durability under excessive abrasive wear and thus is unaffected by the use of strong soap, scouring powders and cleaners.

FORM X

To Obtain Smooth Concrete Surfaces Over Plywood and Form Lumber

Form X has been developed after long research to discover a coating for plywood and dressed lumber that would produce a *Smooth* surfaced concrete, without the grain marks of the lumber and plywood showing as a result of the cement following the contour of the grain.

Form X is a waterproof and alkaliproof transparent liquid coating, that by being thinned to an easy working consistency is applied with a long handled bristle brush. This completely closes the pores, coats the entire surface and produces a smooth, glass-like film. Penetrates and adheres to the forms and will film and bridge narrow openings between the boards or sheets making one continuous and unbroken area.

Form X treated forms may be used over and over again by just recoating. Does not discolor concrete.

Form X is a perfect preservative for any material to which it is applied. Form X can be used at any temperature in any climate, by inexperienced labor at negligible cost. Dries completely in 15 minutes.

Form X has a covering capacity of 200 to 300 square feet per gallon. New material should be given a priming coat, thinned with 25% of Form X *Thinner* and a second finishing coat of Form X thinned 10%. When forms are used again just one finishing coat is required.

5
10

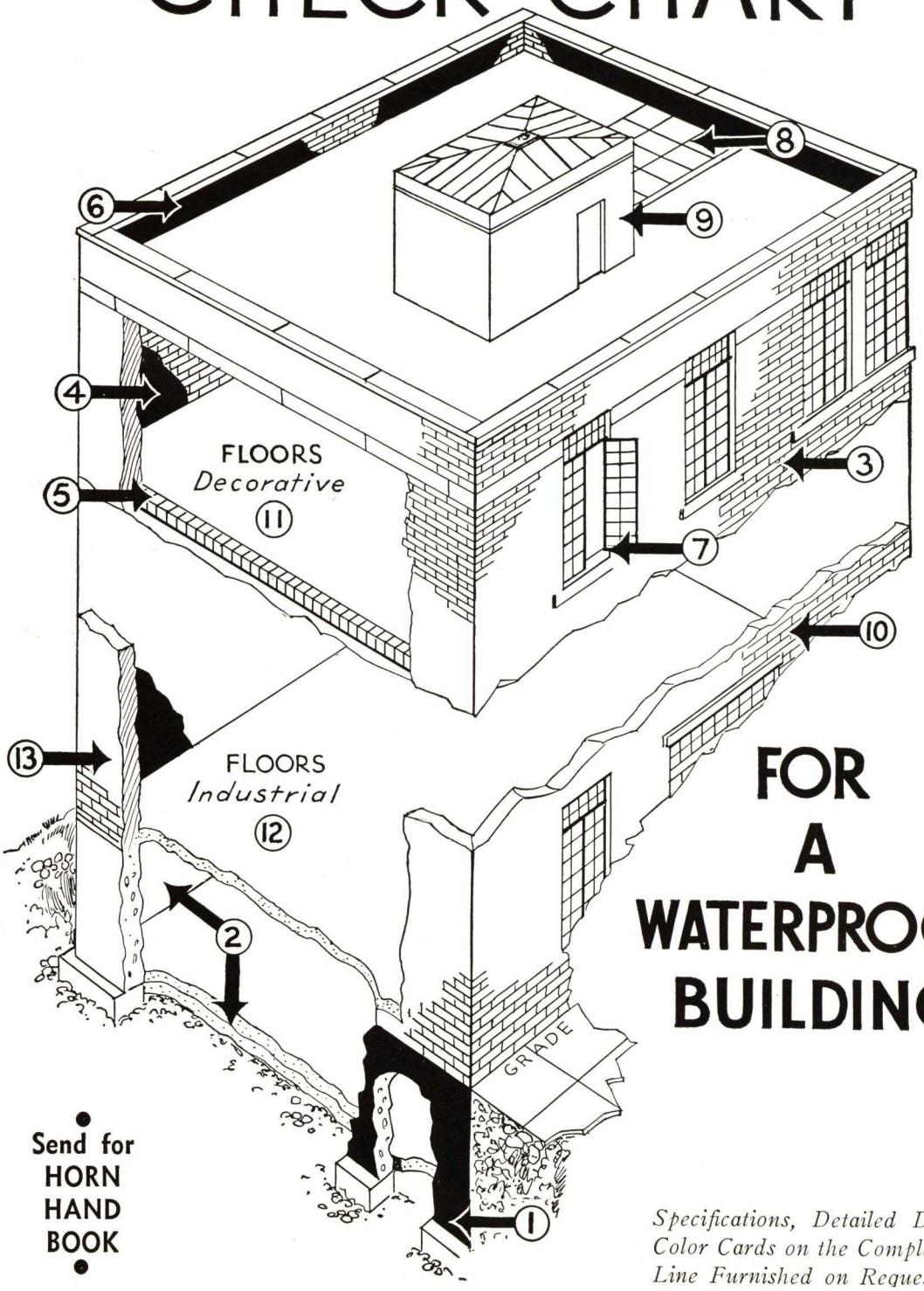
ESTABLISHED 1897

A. C. HORN COMPANY

Products for Preservation and Decoration
Horn Building, LONG ISLAND CITY, N. Y.
BRANCHES AND WAREHOUSES IN PRINCIPAL CITIES

A HORN PRODUCT FOR EVERY CONDITION AND METHOD

CHECK CHART



FOR A WATERPROOF BUILDING

Send for HORN HAND BOOK

Specifications, Detailed Data and Color Cards on the Complete Horn Line Furnished on Request.

WATERPROOFINGS—DAMPPROOFINGS—FLOOR TREATMENTS

To Set a Proper Standard in Your Specifications — Specify "Horn or Equal"

1 FOUNDATION WATERPROOFING (Against Surface Drainage)

Coat exterior of foundation walls below grade with DEHYDRATINE No. 4 FOUNDATION COATING. Waterproof all concrete below grade with HYDRATITE, 2 lbs. per bag of cement. Fill joint between floor and wall with HORN EXPANSION JOINT CEMENT.

2 FOUNDATION WATERPROOFING (Against Hydrostatic Head)

Specify METALON metallic waterproofing on top of rough floor slab and inside of walls to grade level. Specify HYDRATITE integral waterproofing, 2 lbs. per bag of cement for all concrete below grade. Specify "Horn detail joint" between floor and wall.

3 BRICK MORTAR

Specify 1 part cement, 1 part lime, 6 parts sand with 2 qts. HYDRATITE integral waterproofing for each bag of cement and lime, for watertight "pre-shrunk" mortar joints, and minimum efflorescence.

4 DAMPPROOFING EXTERIOR WALLS

A.—Brick—For walls well pointed up where no openings are to be bridged, use DEHYDRATINE No. 1 under furring. For walls not solidly built, use DEHYDRATINE No. 10 SEMI-MASTIC. For finest jobs specify DEHYDRATINE No. 10 MASTIC.

B.—Concrete Walls—Do not attempt to bond lime or gypsum plaster to concrete. Either fur the walls after applying DEHYDRATINE No. 1 or roughen the surface and apply Portland cement plaster, waterproofed with HYDRATITE.

5 SPANDREL BEAM WATERPROOFING

Specify *Horn Spandrel Beam Method* using TRIPLE-FLEX Fabric.

6 PARAPET WATERPROOFING

A.—Parapet Joints—Prime with shellac or lacquer and fill with VULCATEX CAULKING COMPOUND installed by "Vulcatex Thriftube Pressure Method."

B.—Parapet Backs—Prime with DEHYDRATINE No. 1. Trowel on $\frac{1}{16}$-in. thickness of DEHYDRATINE No. 10 MASTIC from coping line to flashing of roof line.

7 WINDOW CAULKING

Avoid narrow joints. Specify minimum width ½ in. Pack with oakum to within ½ in. of surface. Prime joints with shellac or lacquer. Caulk with VULCATEX using "Vulcatex Thriftube Pressure Method."
Specify same for door openings.

8 TILED ROOF DECKS (Joints)

Specify HORNEX Rubber Expansion Joint for priming and filling 1-in. joints between roof deck and parapet. Install HORNEX joints at 10-ft. intervals throughout roof area.

9 PENTHOUSE or STUCCO WALLS

Specify one coat of SYMENTREX SUCTION STOP *two coats of* SYMENTREX, of color to be selected. All cracks or openings must be filled or pointed first.

10 POROUS MASONRY

A—To seal porosity, and slightly deepen the color thereby developing texture, apply two coats DEHYDRATINE No. 2.

B—To seal the porosity and not change color use two coats DEHYDRATINE No. 2A transparent waterproofing.

11 CEMENT FLOORS (Decorative)

A—Specify COLORUNDUM "in accordance with manufacturers directions" for cement floors that are equivalent to tile in beauty and durability. Standard colors—red, green, brown, black, French grey (all priced the same).

B—For floors already installed use HOLZON. Can be used below grade—or Koncrex.

12 FLOORS (Industrial)

A—Heavy duty concrete: Specify 40 lbs. per 100 sq. ft. FERRO-FAX metallic hardener.

B—Average factory floor: Specify 30 lbs. per 100 sq. ft. FERRO-FAX metallic hardener. (In colors also.)

13 LEAKY BUILDINGS

HORN maintains a nation-wide service of waterproofing engineers to render expert reports and recommendations on remedial waterproofing of all types of existing structures.

These Products Are Time-Tested, Meet Rigid Specifications and Are Unexcelled for Quality, Efficiency and Economy

THE HYDROLITHIC WATERPROOFING CO., INC.

ASSOCIATE CONTRACTORS

THE HYDROLITHIC WATERPROOFING CO., INC.
6415 Hamilton Avenue
PITTSBURGH, PA.

TAYLOR-HYDROLITHIC CO., INC.
95 Liberty Street
NEW YORK, N. Y.

Service

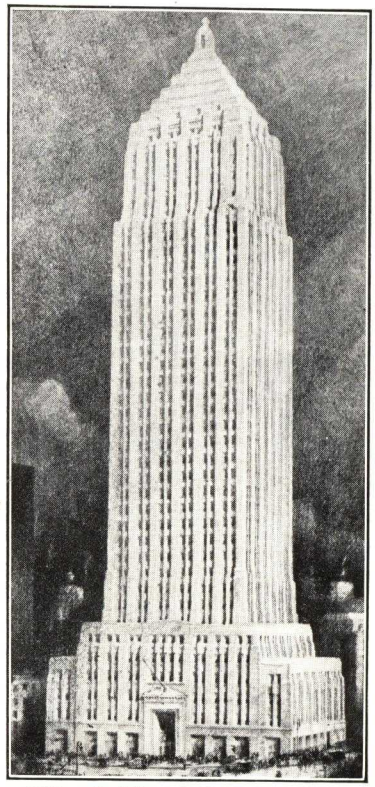
We specialize in the waterproofing of basements, pits, pools, shafts, tanks, tunnels, etc., in both *New* and *Old* structures, and do not undertake work for which we cannot give a positive guarantee against the penetration of water, mineral oils, gases and certain acids. We operate throughout the country and all applications are made by experienced mechanics trained in our service. To procure satisfactory results a thorough knowledge of both material and application is very essential, and for this reason we offer no material for sale.

Product

Hydrolithic is a waterproof cement, applied as a coating, 5/8 in. thick to the inside surfaces of exterior walls, and 1 in. thick over the top of the floor slab; producing a sanitary wall finish, smooth and even, and a long-wearing floor surface of pleasing light gray color.

Our coatings are perfectly bonded and become not only a permanent part of the structure to which they are applied, but lend strength and durability as well. A pioneer in the field of cement waterproofing, Hydrolithic has a long and successful record, and that record will continue, as we rigidly maintain our high standard for both material and workmanship.

TRADE-MARK
HYDROLITHIC
30 YEARS OF DISTINCTIVE SERVICE



Office Building Gulf Refining Co., Pittsburgh, Pa.
TROWBRIDGE & LIVINGSTON, Architect
E. P. MELLON, Associate Architect

Advantages

Waterproofing the inside surfaces of structures has many advantages over the outside method as it requires less excavating, eliminates supporting walls, furring and plaster, and takes the place of the usual floor finish. In case of fracture, due to damage or settlement, repairs can be quickly and economically made, as our waterproofing is exposed to view and is readily accessible. Another advantage is that it can be applied to wet or dry surfaces, even under heavy water pressure. Lastly, our coatings do not deteriorate, but become stronger and harder with age.

Specifications

The interior surfaces of all exterior walls to a height of.....feet, and the interior columns to a height of..... feet above the finished basement (sub-basement) floor, and over the entire basement floor, including the sides and bottoms of all pits, trenches or other depressions, and any walls against earth between floor levels, shall be waterproofed with Hydrolithic Cement Coatings, applied by THE HYDROLITHIC WATERPROOFING CO., INC., Pittsburgh, Pa., or Taylor-Hydrolithic Co., Inc., New York, N. Y.

Prior to the application of the waterproofing, all the surfaces shall be thoroughly roughened, and washed clean.

Wall coating shall be applied in two coats, making a total thickness of not less than 5/8 in.; finished by float, or steel trowel, to a smooth and even surface.

Floor coating shall be 1 in. thick, applied in one coat, floated and troweled to a smooth and even surface, and this coating shall serve as the finished wearing surface, as well as the waterproofing medium.

Guarantee

The waterproofing contractor shall furnish a written guarantee covering his work, for a period of 5 years.

During this time he shall, at his own expense, promptly repair any leaks which may develop, provided such leaks are not due to structural changes in the building, or to external damage to the waterproofing, for which he is not responsible.

REPRESENTATIVE INSTALLATIONS

BUILDINGS AND LOCATIONS	ARCHITECTS	BUILDINGS AND LOCATIONS	ARCHITECTS
Cathedral of St. John the Divine, N. Y.	Cram and Ferguson	Horne Dept. Store, Pittsburgh, Pa.	Janssen & Crocker
The Hangar Club, New York, N. Y.	Cross and Cross	Mellon National Bank, Pittsburgh, Pa	Trowbridge & Livingston
Mrs. Fredk. E. Guest Res., Roslyn, N. Y.	Grosvenor Atterbury	H. J. Heinz Auditorium, Pittsburgh, Pa.	Albert Kahn
Yale & Towne Mfg. Co., Stamford, Conn.	James Gamble Rogers	Standard Sanitary Co., Various Cities	Hunting, Davis & Dunnells
B. F. Goodrich Co., Akron, Ohio	Purdy and Henderson	Bell Telephone Buildings, Various Cities	Various Architects
H. T. Parson Res., Long Branch, N. J.	Horace Trumbauer		
Federal Reserve Bank, Pittsburgh, Pa.	Walker & Weeks		

SECTION 5

CONTINUED ⟶

ESTABLISHED 1889

H. B. FRED KUHLS

TELEPHONE
SUNSET 6-2867

OFFICE AND FACTORY
6411-6423 Third Avenue, BROOKLYN, N. Y.

REPRESENTATIVES

CHARLESTON, S. C., Wm. M. Bird & Co.
CHICAGO, ILL., Fred J. Barker, 9 So. Clinton St.
CLEVELAND, OHIO, Upson Walton Co., 1310 W. 11th St.
DALLAS, TEX., Macatee, Inc., P. O. Box 245
PITTSBURGH, PA., Fort Pitt Mfg. & Supply Co., 116 Seventh St.
PORTLAND, ORE., E. E. Gilmer, 316 S. E. Madison St.
SEATTLE, WASH., McCune Merifield Co., 303 Washington Mutual Bldg.
and Tourtellotte-Bradley, Inc., 4th Floor, Whit Bldg.
SAN FRANCISCO, CAL., McCune Merifield Co., 231 Sansome St.

For Kuhls' Elastic Glazing and Caulking Compositions, see File Index

KUHLS' ELASTIC WATERPROOFING COMPOSITIONS AND COATINGS

Products of 50 Years' Experience

H. B. FRED KUHLS has specialized in the manufacture of non-staining elastic waterproofing compositions since 1889. During these 50 years of experience we were in a position to test many compositions for various purposes. Our tests have proven that one composition cannot satisfactorily be used for caulking around windows, pointing-up stone, expansion joints in promenade tile roofs, etc., and we have, therefore, developed the following products each designed to meet the specific requirements of the service for which it is intended.

Kuhls' Elastic Pointing Up Composition

Uses—Recommended for pointing joints in copings, cornices, cap stones, water tables, brick walls, domes, joining tin roofs to walls, and all projecting courses in all types of stone or terra cotta work.

Description—This is a *non-staining* elastic composition made in any color to harmonize with that of the adjoining material. When set, a smooth tough skin forms on the surface which remains elastic at all times. It makes a permanent watertight bond to wood, stone, steel, glass or any other material. Heat, cold or any extreme atmospheric conditions do not affect it. Vibration will not loosen its bond. Acid fumes have no effect on it. Furnished in two consistencies:

Knife Grade: Shipped in 1, 2 and 5-lb. cans; 12½ and 25-lb. pails; 50 and 100-lb. drums. *(100 lbs. will fill approximately 1 cu. ft. of joint.)*

Gun Grade: Shipped in 1, 2 and 5-gal. containers; 30 and 55-gal. drums. *(7 gals. will fill approximately 1 cu. ft. of joint.)*

Specifications for Pointing Joints in Stone, Terra Cotta, etc.—Joints shall be raked out and thoroughly cleaned for a depth of at least ¾ in. Sides of the joints shall then be thoroughly painted with Kuhls' Elastic Joint Paint (manufactured by H. B. FRED KUHLS, Third Avenue and 65th Street, Brooklyn, N. Y.) in one or two coats or until the surface shows a gloss. *(See Elastic Joint Paint.)* Joints shall then be filled with Elastic Pointing Up Composition thoroughly worked and pressed into the joint, to fill the entire joint and shall be neatly finished flush with adjoining surface. Color of Kuhls' Elastic Pointing Up Composition shall be the color as selected by the architect.

Kuhls' Elastic Expansion Joint Composition

Uses—Used for over 40 years for expansion joints in promenade roofing tile, swimming pools, sidewalks, sidewalk lights, etc. It is also used for filling seams in wood floors.

Description—Kuhl's Elastic Expansion Joint Composition is manufactured in any color. It has been used successfully on the terraces of the Capitol at Washington; Army Base in Brooklyn; Brooklyn State Hospital; Radio City, and many other prominent buildings, hospitals, bridges, railroad stations, swimming pools, etc. Exposure to sudden and extreme changes of temperature, as well as movement and vibration do not affect it. It will not soften under the heat of the sun, therefore it will not crack. It will make an elastic watertight joint for many years. This composition is manufactured in *knife consistency* only. Shipped in 1, 2 and 5-lb. cans; 12½ and 25-lb. pails; 50 and 100-lb. drums. *(100 lbs. will fill approximately 1 cu. ft. of joint.)*

Note: The joint must always be painted with Kuhls' Elastic Joint Paint before applying the Elastic Expansion Joint Composition, in order to secure the best results.

Specifications—Expansion joints shall be provided in promenade tile roofing where noted on drawings. All expansion joints shall be cleaned out down to the waterproofing course. After this Kuhls' Elastic Joint Paint shall be applied in one or two coats or until the surface of the joint shows a gloss. The joint shall then be pointed up with Kuhls' Elastic Expansion Composition, thoroughly working the material into the joint to fill the space. Finish shall be left crowned above the adjoining surfaces.

Manufacturers Since 1889

No. 1 Wall Street, Irving Trust Building
VOORHEES, GMELIN & WALKER, Architects
MARC EIDLITZ, General Contractor
23,000 lbs. of Elastic Pointing Up Composition used to waterproof and dampproof back-joints of limestone facing throughout the building

Brooklyn State Hospital
Expansion Joint Composition used for expansion joints in all promenade tile roofs and concrete walks

Kuhls' Elastic Tile Bedding Composition

An elastic waterproofing composition in semi-paste form. On tile or slate roofs it is used as an elastic waterproof bedding beneath the slate and tile. Specifications and complete information furnished on request.

Kuhls' Elastic Waterproof Coating

An elastic fibrous composition for application with a heavy brush or trowel. Used as a foundation dampproofing and waterproofing. Specifications on request.

Kuhls' Elastic Transparent Waterproofing

A colorless, non-staining liquid for waterproofing brick walls, stucco, stone or concrete. Before this waterproofing is applied to the surface it should be examined carefully for cracks which should be cut away and properly pointed up with Kuhls' Elastic Point Up Composition. Windows should be inspected and where necessary, thoroughly caulked before applying the Elastic Transparent Waterproofing.

Kuhls' Liquid Integral Waterproofing

Kuhls' Liquid Integral Waterproofing will waterproof, harden and densify portland cement concrete, floor finish, plaster and mortar. Kuhls' Integral Waterproofing mixed with cement will prevent freezing at 18° F. It will make high early strength withstanding heavy loads twelve hours after laying. Further information and specifications sent on request.

Kuhls' Elastic Joint Paint

Especially recommended for use with Kuhls' Elastic Compositions. This paint is applied with a brush to the sides of the joint where it forms an alkali-resisting, transparent coating. Alkali or lime content in stone in time reduces the life of the elastic composition used to fill the joint if it is not first painted with Elastic Joint Paint.

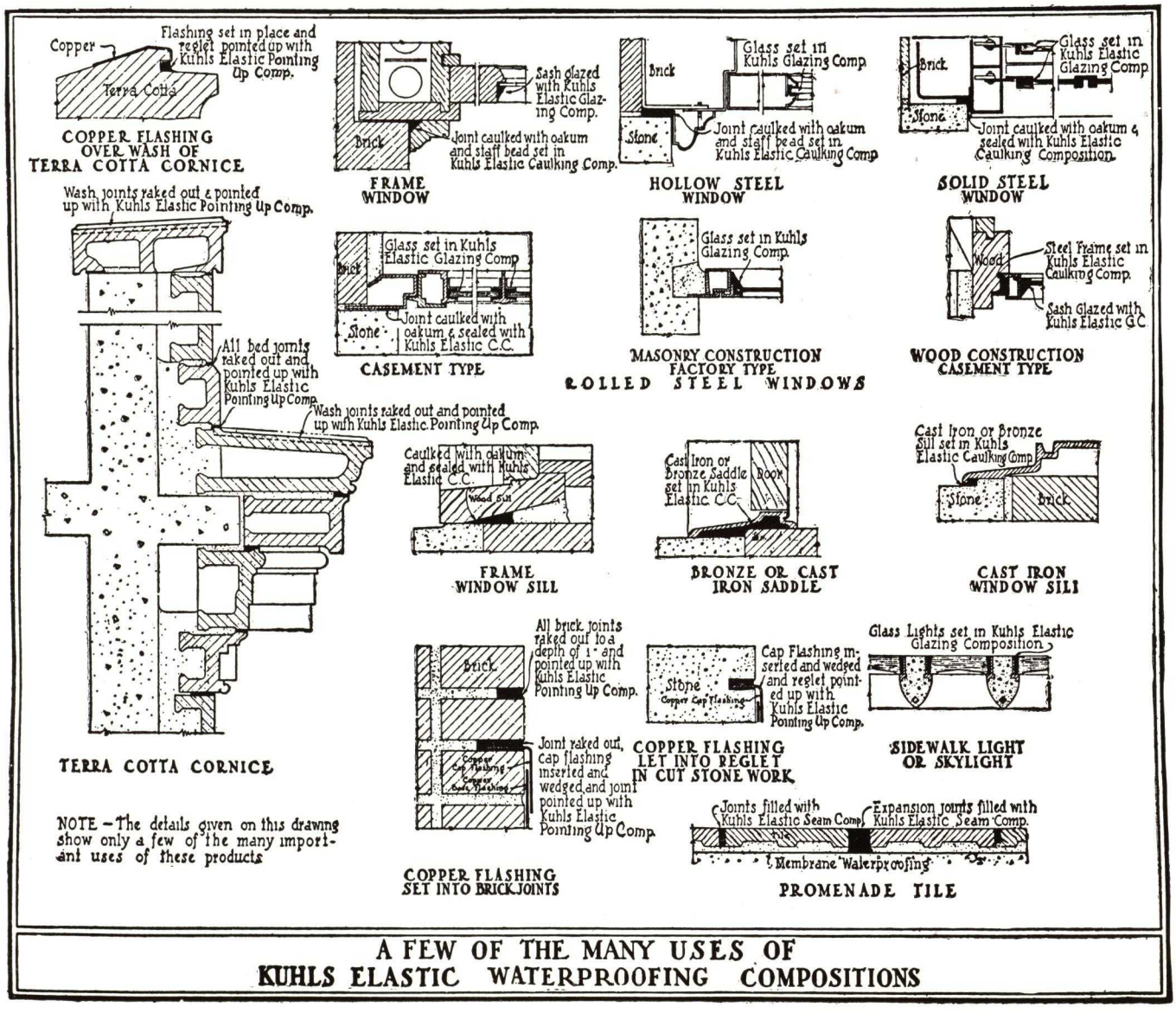
The application of this paint does not delay other work as it dries in ten minutes. Shipped in ½-pt., ½ and 1 gal. cans. *(½ gal. is required for approximately every cu. ft. of joint.)*

A Few Buildings on Which Kuhls' Elastic Waterproofings Have Been Used

Northern Swimming Pool, Madison, Conn.
Boston & Albany Railroad, Worcester, Mass.
Baker Library, Harvard University, Boston, Mass.
Arlington Memorial Bridge, Washington, D. C.
Army Supply Base, Brooklyn, N. Y.
Williamsburg Savings Bank, Brooklyn, N. Y.
Biltmore Hotel, Los Angeles, Calif.
Pader Pelton Building, Los Angeles, Calif.
Plaza Hotel, New York, N. Y.
Woolworth Building, New York, N. Y.
Pennsylvania Terminal, New York, N. Y.
New York Central Railroad, New York, N. Y.
No. 1 Wall Street Building, New York, N. Y.
Chrysler Building, New York, N. Y.
New York City Building, New York World's Fair
Ford Building, New York World's Fair
New York Telephone Building, New York World's Fair
Empire State Building, New York, N. Y.
Radio City, New York, N. Y.

Some Architects Who Have Specified Kuhls' Elastic Waterproofings

J. C. Austin, Los Angeles, Calif.
Allied Architects, Los Angeles, Calif.
Charles P. Baldwin, New York, N. Y.
Claude Beelman, Los Angeles, Calif.
Carrère & Hastings, New York, N. Y.
Cass Gilbert, New York, N. Y.
Halsey, McCormack & Helmer, Inc., New York, N. Y.
Koch & Wagner, Brooklyn, N. Y.
Lee & Hewitt, New York, N. Y.
Meyer & Hunt, Los Angeles, Calif.
McKim, Mead & White, New York, N. Y.
George B. Post & Sons, New York, N. Y.
Palmer & Hornbostel, New York, N. Y.
Charles A. Platt, New York, N. Y.
Sugarman & Berger, New York, N. Y.
Warren & Wetmore, New York, N. Y.
Isaac A. Allen, Jr., Hartford, Conn.
Voorhees, Gmelin & Walker, New York, N. Y.



A FEW OF THE MANY USES OF KUHLS ELASTIC WATERPROOFING COMPOSITIONS

LEWIS ASPHALT ENGINEERING CORPORATION

TELEPHONE
Cortlandt 7-6226

30 Church Street, NEW YORK, N. Y.

KARNAK ASPHALT EMULSIONS AND ALLIED PRODUCTS

LEWIS ASPHALT ENGINEERING CORPORATION, after many years of research and manufacturing, have developed a diversified use of asphalts and allied products to produce the most efficient results under various conditions of application and construction. These are developed primarily into two divisions: Asphalt Emulsions and Liquid Asphalts.

Karnak Asphalt Emulsions were developed to utilize the protective values of a proper asphalt for cold application without converting it into a paint by recourse of solvents; briefly, we have taken this asphalt, together with a dispersing composition of our own invention, and by special processes have chemically and without altering the composition of the asphalt, dispersed it into minute particles, each particle coated with the dispersing agent and each individually suspended in water. There is thus obtained a non-inflammable, odorless and mobile liquid, which may at ordinary temperatures be brushed or sprayed on to any surface, which it is desired to protect and which may even be applied to wet or damp surfaces. A dried film is absolutely stable and plastic at all temperatures. In order to produce the best results possible with asphalt emulsions, it has been necessary to manufacture various types.

With reference to the Liquid Asphalts, we have taken the proper asphalt and a suitable distillate to produce a liquid which can be applied by brush or spray, giving the materials the most durable and effective results for each purpose. These materials are also made in various types to produce the best results under conditions existing at point of application.

It is a well-known fact there is no one type of asphalt that will meet all the requirements and be the most effective, on all types of construction or maintenance work. In the case of asphalt emulsions, it is not desirable or practical to apply them at temperatures below 45° F. On the other hand, they can be applied very effectively to wet or damp surfaces. There are also many instances where the use of heating kettles or inflammable materials are very undesirable and impractical. In most of these cases, however, an asphalt emulsion is the only practical method of applying an asphalt waterproof coating. Our complete line of products has been built up with the ultimate purpose of recommending without prejudice the most suitable material for existing conditions encountered under all classes of construction and maintenance problems.

KARNAK PRODUCTS

Karnak Liquid Dampproofing

A high quality liquid asphalt for application by brush or spray as a plasterbond and dampproofing on interior of exterior walls above grade, when surface is dry. To be used only with lime or gypsum plaster. Coverage 1½ gallons per 100 sq. ft.

Karnak Mastic Dampproofing

This material is composed of Karnak Liquid Dampproofing to which has been added a sufficient amount of high quality asbestos fibre. It is recommended particularly for use with spandrel waterproofing fabric.

Karnak Plaster Bond

A highly efficient emulsion for application on the interior of exterior walls above grade by brush or spray as a combined dampproofing and bond for lime or gypsum plaster. Requires approximately 1½ gallons per 100 sq. ft.

Krodeproof

Recommended as a protective coating only when the surface is subjected to actual continuous contact with water. Coverage is approximately 3½ gallons per 100 sq. ft. by spray or brush application.

Karnak Roof Coating

An emulsion containing a proper amount of long asbestos fibre of brushing consistency for the protection of metal and composition roofing. 100 sq. ft. will require between 3 and 4 gallons of material.

Karnak Caulking Compounds

These are made in both knife and gun grades, in black and colors. Absolutely no free oil will come to the surface on standing and it will not separate in the container.

Karnak Wood Block Mastic

Made in two types for both hot or cold application. Efficient results are obtained with either hot or cold type of wood mastic. The cold type, however, is generally preferred due to its ease of application and eliminating expensive heating equipment and danger of handling hot material to the workman.

Karnak Tile Cement

Produced in two types, for use with asphalt mastic tile. Type A is slow setting and has an average coverage of 100 sq. ft. to the gallon. Type ST is quick setting and has an average coverage of 125 sq. ft. to the gallon.

Karnak Protective Coating

A neat emulsion for the general protection of all surfaces against corrosion due to corrosive fumes, exposure to weather or dampness. Requires approximately 3 gallons per 100 sq. ft.

Karnak Asphalt Paint

This material is a quick drying black paint which dries with a high gloss in about one hour. It has good protective qualities and will cover 100 sq. ft. per gallon. Can only be applied to dry surfaces.

Karnak Joint Filler

Made in two grades; hard for vertical expansion joint and soft for horizontal expansion joints. They are made of appropriate asphalts combined with asbestos fibre and are applied hot.

Other Karnak Products

We also manufacture Spandrel Mastic, Spandrel Fabric, Linoleum Cement, Brush Plastic, Trowel Plastic, and Felt Saturant.

SPECIFICATION MATERIALS

We specialize in manufacturing a complete line of asphalt products meeting the requirements of The American Society for Testing Materials, The American Railway Engineering Association, The Federal Specification Board, The United States Bureau of Standards and various state and county specifications.

KARNAK MASTIC FLOORING

Karnak Floor Primer

An emulsion especially designed for use in priming floor areas before installing Karnak Mastic Flooring. It requires approximately 1½ gallons per 100 square feet.

Karnak Floor Mastic

An asphalt emulsion containing a suitable quantity of long, high tensile strength asbestos fibre and is designed especially for admixture with portland cement and aggregates to produce a durable and resilient floor by cold application.

It is particularly efficient to resurface complete floor areas to withstand heavy traffic; as a floor patching material, and also, as a leveling course preparatory to installing decorative flooring such as rubber or asphalt tile or linoleum.

KARNAK FLOOR MASTIC MIXES SUITABLE FOR AVERAGE CONDITIONS

For resurfacing complete floor areas ½ inch in thickness.	For floor patching or resurfacing floors ½ inch in thickness or less:	As a leveling course where the finished thickness shall be more than ¼ in. and not more than ½ in.
1 bag (1 cubic foot) portland cement. 15 gallons (2 cubic feet) Karnak Floor Mastic. 2 cubic feet clean sharp sand. 3 cubic feet ¼ inch stone or gravel. *This mix will cover approximately 135 square feet, ½ inch in thickness.*	1 bag (1 cubic foot) portland cement. 15 gallons (2 cubic feet) Karnak Floor Mastic. 3½ cubic feet clean sharp sand. *This mix will cover approximately 110 square feet, ½ inch in thickness.*	1 bag (1 cubic foot) portland cement. 15 gallons (2 cubic feet) Karnak Floor Mastic. 2 cubic feet sand. 5 cubic feet ¼ inch gravel or stone chips. *The above mixture will cover approximately 160 square feet ½ inch in thickness. This mix does not govern leveling courses greater than ½ inch or less than ¼ inch.*

KARNAK SYSTEM OF ERECTION AND PROTECTION OF REFRIGERATION INSULATION

Korkrete Primer

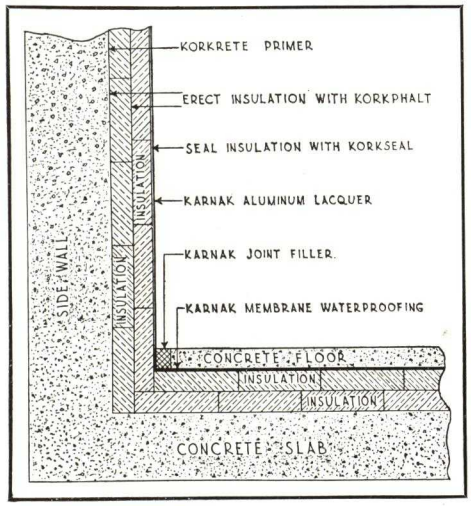
A quick drying primer for application to concrete before the erection of corkboard.

Korkphalt

A special cork setting asphalt, applied hot over cork to secure bond to Korkrete Primer on masonry surfaces. It possesses the highly desirable combination of high melting point with great adhesive strength.

Korkseal Primer

A neat emulsion for the protection of corkboard from the infiltration of moisture and also a primer for the application of Korkseal.



Korkseal

A fibrated emulsion of troweling consistency to produce a smooth surface over corkboard which gives the insulating material added protection from abrasion when combined with sand. It makes an ideal base for the application of Karnak Aluminum Lacquer as a decorative finish.

Karnak Aluminum Lacquer

It is made from a nitrocellulose base and solvents which will not dissolve asphalt. It dries within thirty minutes after application. The dried film is extremely durable and may be washed with hot soapy water.

QUANTITIES REQUIRED FOR EACH 100 SQUARE FEET

Korkrete Primer: 1½ gallons.

Korkphalt: 60 lbs. per layer of insulation.

Korkseal Primer: 1½ gallons.

Korkseal: 6 gallons when combined with equal volume of clean sharp sand.

Karnak Aluminum Lacquer: ¼ gallon.

KARNAK MEMBRANE WATERPROOFING

The Karnak system of waterproofing consists of a highly refined and very ductile asphalt, reinforced and held in place by a strong elastic interlocking membrane made of cotton cloth saturated with asphalt. Since Karnak Asphalt contains no impurities or foreign matter and is held in place by a strong elastic binder, fewer plies are required than in felt systems.

In most instances, 2 plies of Karnak Waterproofing Fabric with 3 heavy moppings of Karnak Asphalt will give absolutely adequate protection. The number of plies is a variable and depends on the character of work and surrounding conditions.

The following table will be found convenient as giving a general indication of what will be required on average work within a reasonable margin of safety.

Hydrostatic Head	Number of Plies
Up to 15 feet	2
15 to 50 feet	3
over 50 feet	4

Four plies will be sufficient to waterproof any class of work regardless of head.

Uses

This method of waterproofing is thoroughly dependable for use on building foundations, bridges, viaducts, pump wells, swimming pools, retaining walls and wherever construction is exposed to water pressure.

Quantities

For 2-ply work it will require 25 square yards of Karnak Waterproofing Fabric and 100 pounds (12 gallons) of asphalt per 100 square feet of surface to be waterproofed, applied in accordance with manufacturer's specifications.

Karnak Waterproofing Fabric

It shall be a woven cotton fabric with a thread count of not less than 18 by 18 nor more than 26 by 26. Before being delivered on the work it shall have been thoroughly saturated with an asphalt meeting all of the requirements for asphalt as specified. The finished fabric shall have a tensile strength of not less than 50 pounds per inch of width both in warp and in the filling, grab test and the stretch in both directions shall average not less than 10 per cent. It shall weigh when saturated at least three times the untreated fabric showing a saturation of not less than 200 per cent. Karnak Fabric is specially prepared for smooth and easy application. The saturated fabric will unroll easily at all temperatures which is a decisive factor in keeping labor costs to a minimum.

LASTIK PRODUCTS CO., INC.

Calking Compounds, Roof Cements and Maintenance Paints

GENERAL OFFICES
American Bank Building, PITTSBURGH, PA.

MAIN WORKS
WAMPUM, PA.

PRODUCTS

LASTIKALK CALKING and GLAZING COMPOUND, LASTIKALK POINTING CEMENT, WAMPUM CALKING COMPOUND, LASTIK ROOF CEMENT, LASTIK ROOF PAINT, LASTIK MAINTENANCE PAINTS, LASTIK FOUNDATION WATERPROOFING, LASTIK CLEAR DAMPPROOFING and LASTIK ALUMINUM PAINT.

LASTIKALK CALKING AND GLAZING COMPOUND

A waterproof plastic that is weatherproof, being unaffected by changes in temperature or chemical gases. It will surface-dry for painting overnight, yet permanently remains pliable underneath, never cracking or drying out. It will absolutely prevent damage from rain, snow, wind, dirt and dust. It will adhere to any surface—wood, metal, masonry or glass. It expands and contracts with the surface to which it is applied and heat, cold and moisture conditions will not affect it. Lastikalk is manufactured in the following colors in addition to the standard gray: limestone, natural, cream, buff, black, brown, terra cotta, red, green, white. Any shade matched from color chip.

For Calking—*(Consistencies)*—*Knife Grade*—To be applied with a putty knife or trowel. *Gun Grade*—will work satisfactorily with any reputable gun on the market. It can be used with guns of any convenient capacity or nozzle size that will suit the individual job.

For Glazing—For all types of construction that are subjected to unusually severe conditions: i.e., gas and acid fumes, excessive vibration, variations in temperature, etc., Lastikalk Compound should be used for bedding and glazing all glass. Its elasticity prevents breakage of glass. It goes much farther than putty.

Packing—Lastikalk, Gun Consistency, is packed in the following sized containers: 1 and 5-gal. cans; 30 and 55-gal. drums. Lastikalk is also packaged in convenient time and money saving cartridges of 1 pt. capacity, packed 16 or 24 to the carton. Lastikalk, Knife Consistency, is packed in the following sized containers: 1-lb. cans—60 to a carton; 5-lb. cans—12 to a carton; 12½-lb. steel kits; 25-lb. steel kits; 50-lb. steel kits; 480-lb. drums; 880-lb. drums.

General Specifications—All joints around outside windows and door frames shall be calked with Lastikalk Compound, applied in accordance with the specific specifications.

Specific Specifications—Wood Window and Door Frames—

(1) For Calking Behind Staff Bead:

(a) The general contractor shall provide for removing temporarily set staff beads previous to calking of joints around window and door frames; and after calking is completed, inspected and approved, he shall reset same permanently in place.

(b) Where joints between frame and surrounding masonry are wider than ¼ in. and deeper than ¾ in., these joints shall be packed to within ½ in. of frame surface with dry jute or oakum, solidly tamped. Remaining space shall be filled with Lastikalk Compound.

(2) For Calking Between Staff Beads and Masonry or Where There Is No Staff Bead:

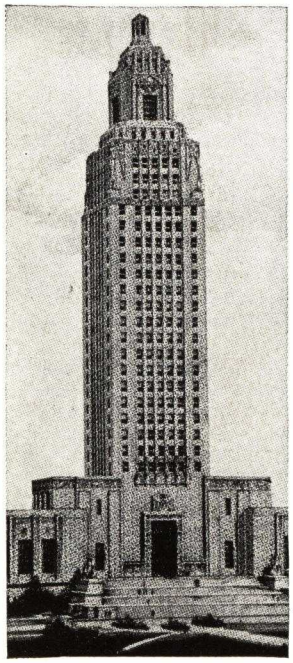
(a) Thoroughly calk all joints around all windows and door frames with Lastikalk Compound, forcing compound into the space between staff beads and masonry (between frames and masonry), around jambs, heads and sills.

(b) Where joints between staff bead and surrounding masonry (between frames and surrounding masonry) are wider than ¼ in. and deeper than ¾ in., these joints shall be packed to within ½ in. of frame surface with dry jute or oakum, solidly tamped. Remaining space shall be filled with Lastikalk Compound.

LASTIKALK POINTING CEMENT

For pointing up masonry and stonework. This product has been developed to meet the specific needs of this particular kind of work. Its high elasticity of body combined with its cementlike appearance and tenacity in "staying put," make it invaluable in exterior pointing of exposed joints. It is used extensively on tile, limestone and terra cotta construction. *It is absolutely stainless.*

A FEW PROMINENT INSTALLATIONS



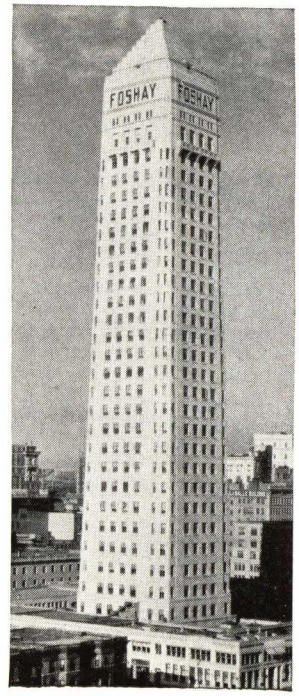
Louisiana State Capitol

Southern Bell Telephone Co., Mobile, Ala.
Smithfield Court Housing Project, Birmingham, Ala.
U. S. Post Office, Greensboro, Ala.
Guaranty Bank, Little Rock, Ark.
U. S. Veterans' Hospital, Fayetteville, Ark.
Agricultural and Post Office Bldg., Heber Springs, Ark.
County Courthouse, Denver, Colo.
South Denver Masonic Temple, Colorado

Washington, D. C.

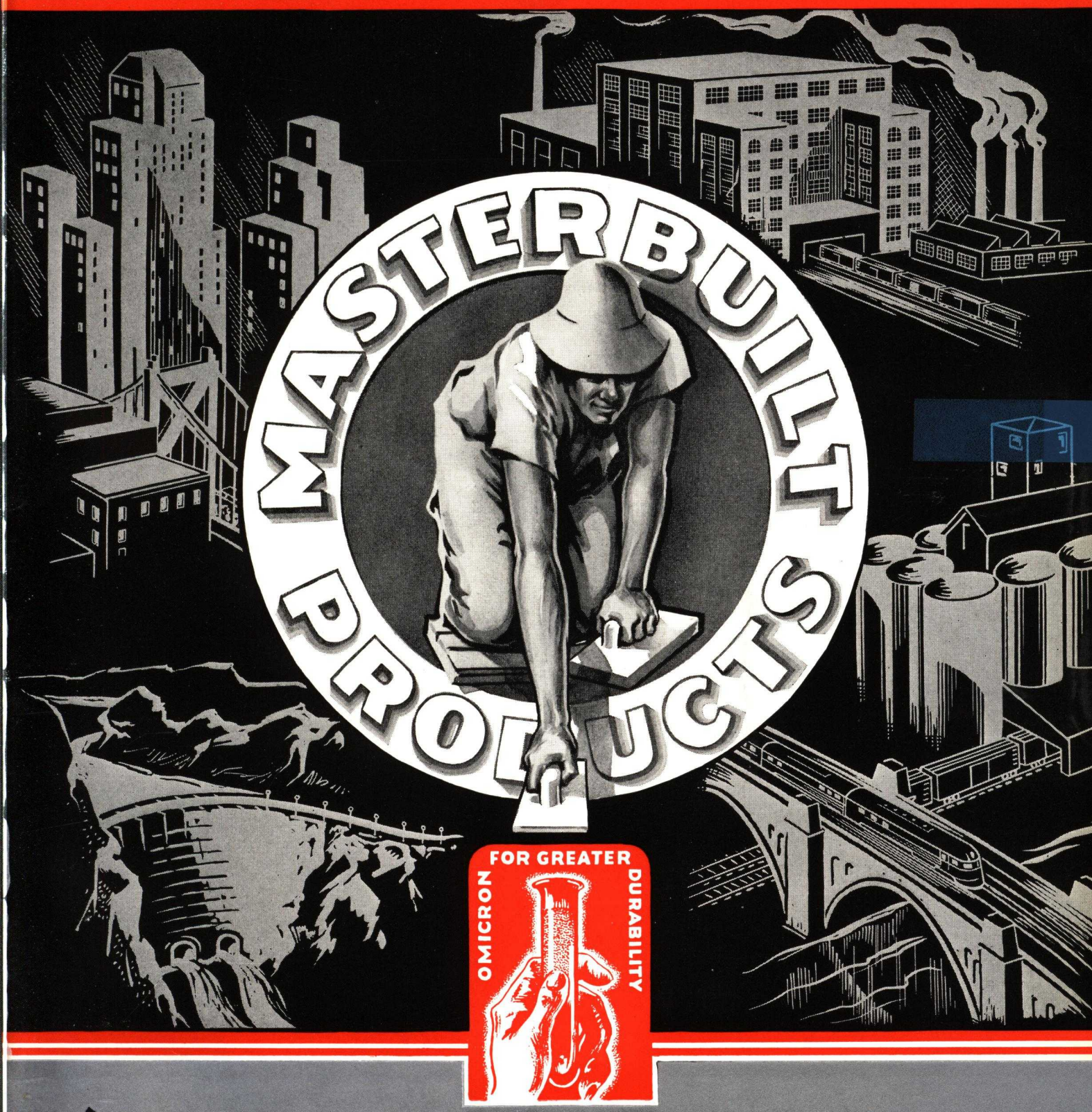
Sacred Heart Church
De LaSalle College
St. Johns Seminary
Japanese Embassy
House of Representatives Office Bldg.
Library of Congress Addition
Engineering Laboratory, U. S. Bureau of Standards
DuPont Circle Building
Potomac Electric Power Co. Bldg.
Southern Railway Bldg.
Soviet Embassy
Chinese Embassy

El Verona Hotel, West Palm Beach, Fla.
City Hall, Miami Beach, Fla.
Sarasota Terrace Hotel, Sarasota, Fla.
Ponce de Leon Hotel, Miami, Fla.
Burdine's Dept. Store, Miami, Fla.
San Jose Golf Club, So. Jacksonville, Fla.
Park Lane Apt. Bldg., Jacksonville, Fla.
Biscayne Plaza Theater, Miami Beach, Fla.
Maxwell House Products Co., Jacksonville, Fla.
Volunteer State Life Insurance Bldg., Atlanta, Ga.
Police Station and Jail, Atlanta, Ga.
Techwood Housing Project, Atlanta, Ga.
Quartermaster Stores, Fort McPherson, Ga.
Masonic Temple, Rock Island, Ill.
A. T. & T. Co., Repeater Bldg., Vandalia, Ill.
Public Library, Champaign, Ill.
Trumbull Park Housing Project, Chicago, Ill.
Indiana Bell Tel. Co., Indianapolis, Ind.
Stamfer Dept. Store, Dubuque, Iowa
John Deere & Company, Waterloo, Iowa
U. S. Penitentiary Annex, Fort Leavenworth, Kan.
College Court Housing Project, Louisville, Ky.
Blue Grass Park, Aspindale Housing Project, Lexington, Ky.
Immaculate Conception Convent, New Orleans, La.
Fisher Body Corp. (Factory), Pontiac, Mich.
Coca-Cola Bottling Co., Flint, Mich.
Water, Light & Power Bldg., Grand Rapids, Minn.
Northern Pacific Ry., White Bear Lake, Minn.
Continental Life Ins. Bldg., St. Louis, Mo.
Governor's Mansion, Albany, N. Y.
Bellevue Hospital, Pavilions C & D, New York, N. Y.
State Capitol, Bismarck, N. D.
Oliver Bldg., Pittsburgh, Pa.
Cedar Springs Housing Project, Dallas, Tex.
Vanderbilt University, Nashville, Tenn.
Commerce Hall, University of Vermont, Burlington, Vt.
Hotel Roanoke Addition, Roanoke, Va.
Aluminum Goods Mfg. Co., Two Rivers, and Manitowoc, Wis.



Foshay Tower

TECHNICAL TREATMENTS FOR CONCRETE AND MASONRY



The Master Builders Company
Cleveland Ohio

In Canada - The Master Builders Co., Ltd. Montreal · Toronto

5/15

Thirty years of field experience and laboratory research in concrete and masonry treatments stand back of Master Builders specifications and products. This specialized knowledge is "on call" for architects and builders.

• • • INDEX • • •

Type of Product	Trade Name of Product	Purpose of Product	Page No.
For "Leakproof" Masonry Mortar	MORTARPROOFING	For Reducing Shrinkage, Increasing Adhesion, Checking Efflorescence, and Absorption, and Plasticizing Mortar.	4 and 5
For Workable Low Water Ratio Concrete	POZZOLITH	Eliminates up to 20% of mixing water, yet improves placeability, increases density.	6 and 7
Concrete Floor Hardeners	MASTERPLATE	For Super Heavy Duty Concrete Floors.	12
	METALICRON	For Hardening Industrial and Heavy Duty Concrete Floors.	13
	MASTER MIX	For Hardening Commercial and Light Duty Concrete Floors.	13
	SANISEAL	For Hardening and Dustproofing Concrete Floors *After Installation.*	15
Colored Concrete Floor Hardeners	COLORMIX-KUROKROME METHOD	For large or small areas—low cost method. For coloring and hardening throughout topping—ten integral colors.	8 and 9
	COLORED METALICRON	For Coloring and Hardening Concrete Floors by Dust-Coat Method.	10
	DYCROME	For Coloring and Hardening Concrete Floors *After Installation* by Acid Stain method.	10
Integral Waterproofings	STEAROX "30"	For Waterproofing Mass Concrete and Mortar—A 30% concentrated pure stearate paste.	11
Surface Waterproofings and Dampproofings	MASTERSEAL	For Transparent Surface Waterproofing on wet or dry masonry.	11
	METALLIC WATERPROOFING	For waterproofing floor and wall areas against hydrostatic pressure.	15
	MASTERTEX	Waterproof Cement Paint for Masonry—ten colors.	12
	CAULKING COMPOUND	In nine colors and natural. Applied by knife or gun.	15
	PLASTER BOND FOUNDATION C'T'G.	For Dampproofing and Insulation.	15
Miscellaneous Products	CONCRETE PRESERVATIVE	Corrosion resistant penetrant for Concrete.	15
	KURO	Liquid curing coat for fresh concrete and floors.	15
	BONDING IRON	For Bonding Concrete Topping to Base Slab.	15
	EMBECO	For Grouting, Reintegration and Repairs.	14

LIST OF BRANCH OFFICES AND REPRESENTATIVES ON BACK COVER

The Master Builders Company
CLEVELAND, OHIO

OMICRON

THE IMPORTANT INGREDIENT FOR DURABILITY IN CONCRETE

● *Omicron*, discovered in 1927 by Master Builders Research Laboratories, performs the unique function of *reducing the volume of water needed to provide an ideal placeability* in *all* concrete or mortar mixes. The importance of this development cannot be overlooked, for it marks a new and radical advance in the effort materially to increase the practical life of concrete structures. This sharp reduction in the volume of water in concrete or mortar mixes results in greatly increased *density*, reduced *shrinkage*, a sharp increase in *strength*, a stubborn resistance to the disintegrative attack of *freezing and thawing* and *corrosion*.

DURABILITY

● This ultimate goal of all concrete or mortar designers, is best achieved through a reduction in the volume of water. *Omicron* products provide the architect and the engineer with greater control of the density and water-tightness of the concrete or mortar used in the construction of their jobs.

STRENGTH

● This reduction in the volume of water needed to obtain ideal placeability results in a natural increase in strength; field and laboratory tests show for concrete and mortar made with *Omicron* products a much greater strength than plain mixes.

POZZOLANIC ACTIVITY

● Important to many projects is the added resistance *Omicron* products build into concrete and mortar . . . resistance against corrosion and attack by natural alkalies and acids present in the soil and air. *Omicron* preserves the increased density imparted to concrete and mortar by Master Builders products.

INCREASED PLACEABILITY

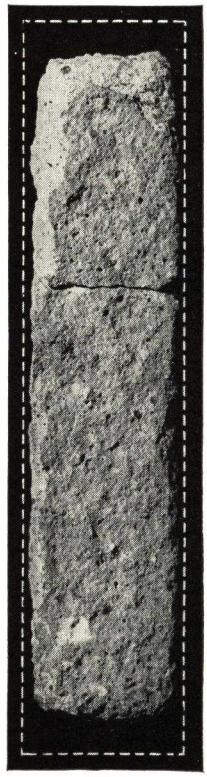
● With much less water! From scores of engineers, architects and contractors have come unsolicited substantiation of the claims made for *Omicron* products. Of major importance is the fact that under actual job conditions *Omicron* products have enabled engineers to create from unusually dry mixes concrete and mortar of exceptional placeability.

UNTREATED

The Effects on Mortar of 150 Cycles of Freezing and Thawing

● Here are pictured the results of 150 cycles of freezing and thawing on 1:5 mixes tested by Loring O. Hanson, registered professional engineer, University of Wisconsin. The specimen to the right was fortified with Pozzolith, an *Omicron* product. Note the comparative rate of disintegration; break tests for strength showed the Pozzolith specimens 75 per cent stronger than the plain specimens. Dotted lines indicate original size of specimens.

The results of these tests are the answer to the question, "How long will concrete with Omicron last?" 150 cycles of freezing and thawing are an accelerated test equivalent to many years of severe exposure.

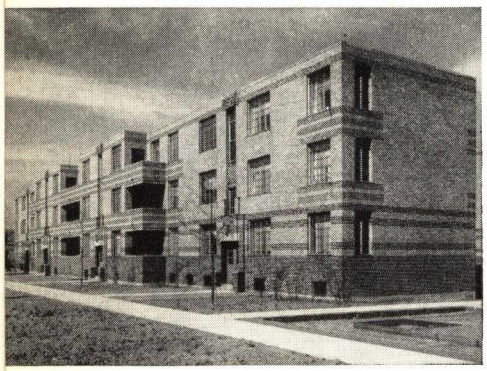


WITH POZZOLITH

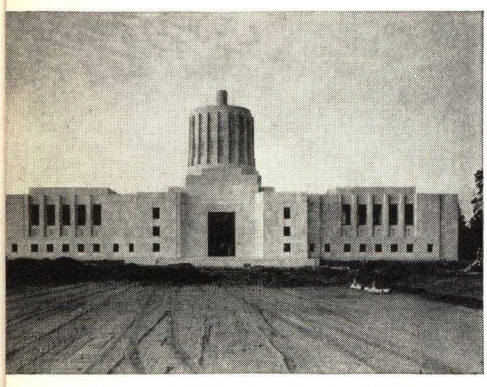
IN CANADA The Master Builders Co. Ltd.
TORONTO, ONTARIO

OMICRON MORTARPROOFING

● *Erie County Jail, Buffalo, N. Y. Architects—Green and James, Buffalo, N. Y. Contractors—The John W. Cowper Co., Buffalo, N. Y.*



● *Outhwaite Homes Project, Cleveland, Ohio. Architects—Maier, Walsh and Barrett, Cleveland, Ohio. Contractors—Geo. A. Fuller Co., New York City, N. Y. Masonry Contractor—C. O. Struse, Philadelphia, Pa.*



● *Oregon State Capitol, Salem, Oregon. Architects—Trowbridge & Livingston, New York, N. Y. Asso. Archts.—Whitehouse & Church, Portland, Oregon. Contractor—Ross B. Hammond, Portland, Oregon.*

● *Pennsylvania Railroad Station, Newark, N. J. Architects—McKimm, Meade & White. Contractors—Geo. A. Fuller Co., New York, N. Y.*

AUTHORITIES agree that cracks between the mortar and brick are the major cause of leakage. *All* mortars shrink, whether patented masonry cements, standard cement or lime or combinations of cement and lime, waterproofed or otherwise. Shrinkage is inevitable, because more than twice as much water is required for workability than is needed to hydrate the cement. *By a reduction in water volume without the loss of workability, shrinkage can be checked.*

Omicron Mortarproofing produces an ideally workable mortar *with much less water—and reduces shrinkage beyond the critical point at which the bond breaks.*

● CHECKS INITIAL SHRINKAGE

Mortarproofing checks the initial shrinkage that occurs during the important first hours of setting. Result—shrinkage cracks prevented.

● CHECKS EFFLORESCENCE

The puzzolanic action of the Omicron ingredient in Mortarproofing reduces the soluble salts which cause efflorescence originating from the cement.

● REDUCES WATER ABSORPTION

The stearate ingredient of Mortarproofing assists bond, checks capillarity, and renders pores water-repellent.

● INCREASES PLASTICITY

The plasticizing action of Mortarproofing so increases the workability that the mason must automatically reduce water or add sand—or do both—to obtain proper consistency.

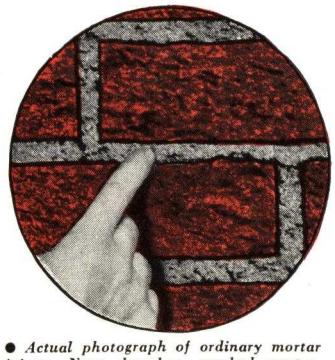
● IMPROVES ADHESION

The plasticizing effect of Mortarproofing increases the extent of bond.

● INCREASES STRENGTH

Reduced water-cement ratio increases the bond, shear and compressive strengths of the mortar.

Specification: (Non-Colored) Mortar for all masonry shall be composed of 1 part cement, 1 part hydrated lime (or lime putty), 6 parts sand; (or 1:2:9; or an approved masonry cement, or other mix as designated) to which shall be added Master Builders Omicron Mortarproofing in the proportions of 2 lbs. per each sack of cement and 2 lbs. per each cu. ft. of lime in exact accordance with the directions of the manufacturer, THE MASTER BUILDERS COMPANY.



● *Actual photograph of ordinary mortar joints. Note shrunken, cracked mortar, permitting rapid water seepage and destruction.*

● *Actual photograph shows how Omicron Mortarproofing preserves the bond—makes possible weatherproof brick walls.*

The Master Builders Company
CLEVELAND, OHIO

OMICRON MORTARPROOFING CHECKS INITIAL SHRINKAGE—THAT MEANS TIGHT, LEAKPROOF WALLS

REDUCES SHRINKAGE

From Columbia University Test Nos. 2356-57

Mix	Shrinkage in Inches 2″x4″ Specimens			Bond Strength*	Comp. Strength*
	24 hrs.	7 days	28 days	28 days	28 days
1:1:6	.027	.030	.030	66.8	704
1:1:6 with M.	**.017**	**.019**	**.020**	**72.7**	**740**
1:2:9	.022	.024	.023	73.0	490
1:2:9 with M.	**.018**	**.014**	**.015**	**90.8**	**569**
1:2:11 with M.	**.010**	**.014**	**.015**	**74.9**	**462**

Average of 3 specimens. *Pounds per sq. inch

REDUCES ABSORPTION

Mix—1:3	Percent absorption by weight				Decreased absorption
	1 hr.	2 hrs.	1 day	Totally immersed	
Untreated.....	1.4	1.8	2.5	3.4	...
Mortarproofing	**0.7**	**0.9**	**1.1**	**1.8**	47%
Average—4 standard Stearate Pastes.	0.65	0.875	1.3	1.85	47%

MORTARPROOFING CHECKS CRACKING IN STUCCO

As every architect knows, the troublesome shrinkage in mortars occurs *during the first 24 hours.* This early shrinkage results in minute, often invisible cracks that later widen and deepen under the attack of weathering and contribute greatly to the untimely disintegration of stucco walls.

Omicron Mortarproofing reduces early shrinkage by 30% . . . *or beyond the critical point where cracks occur!*

COLORED MORTARPROOFING

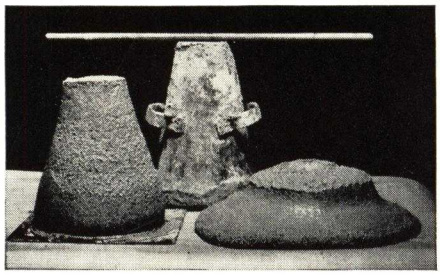
In Colors—Through exhaustive analysis of the mortar color problem a special process for producing finely divided colors ground to a colloidal fineness was developed which eliminated the objections to old style colors, namely: fading, weakening of joints and increased shrinkage.

Colored Omicron Mortarproofing joints *do not fade*, actually increase compressive strength over plain mortar and greatly *reduce shrinkage.*

(Send for color card, with detailed specifications.)

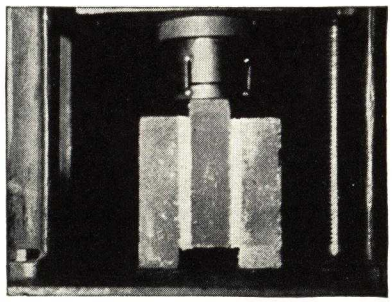
SPECIFICATIONS: Mortar for brick, (stone, tile, terra cotta) shall be proportioned 1 part cement, 1 part lime, 6 parts sand (or other mix as designated), to which shall be added Master Builders (insert the name of the color) Omicron Mortarproofing, in exact accordance with the directions of the manufacturers, THE MASTER BUILDERS COMPANY.

"O.M." GREATLY INCREASES SLUMP

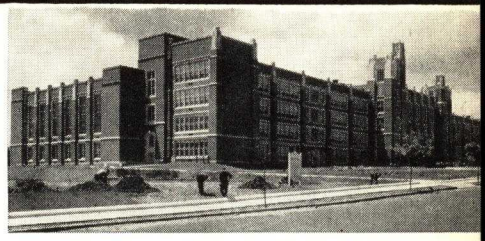


Mix 1:3		
6¼ Gal.	Water per cut. ft.	6¼ Gal.
0 Lbs.	Mortarproofing	2 Lbs.
2¼ Inches	Slump	8 Inches

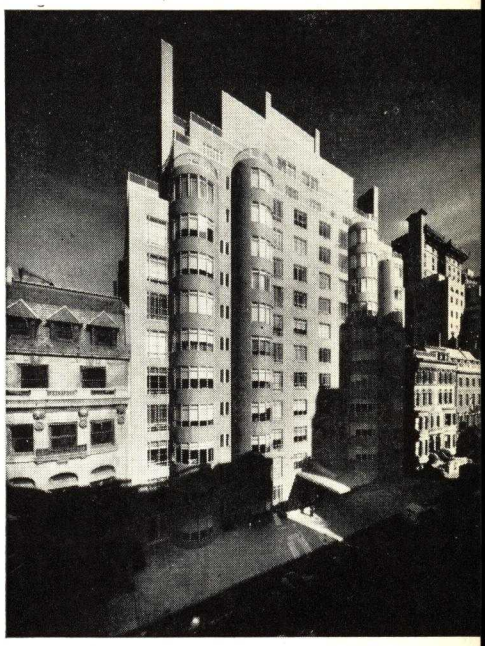
BOND-SHEAR TEST



3,500 Lbs. Pressure Required to Break Mortarproofed Bond

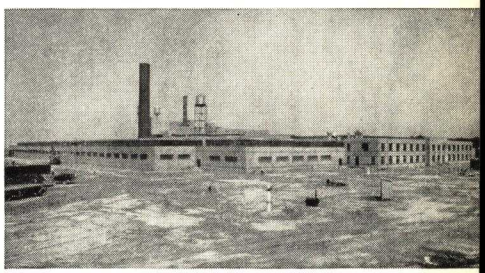


● *Mt. Pleasant Regional High School, Providence, R. I. Architect—Irving S. Gorman, City Hall, Providence, R. I. Contractors—Turner Construction Co., Providence; C. T. Wills, New York, N. Y.*



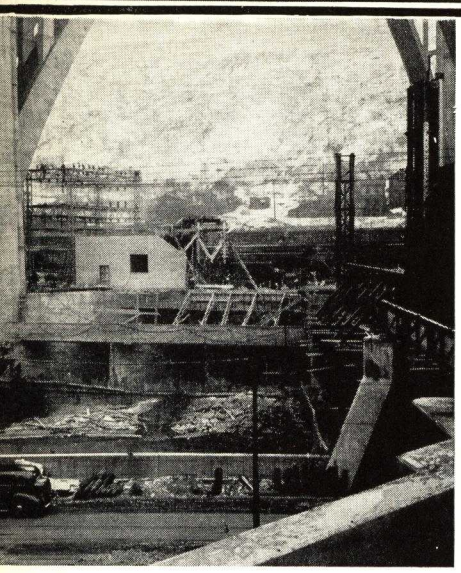
● *The Rockefeller Apartments, New York City. Architects—Wallace K. Harrison and J. Andre Fouilhoux, New York City. Contractors—Barr, Irons & Lane, New York City. Masonry Contractor—Micweil Co., New York City.*

● *Art Center, Wilmington Society of Fine Arts, Wilmington, Del. Architects — Whiteside-Brown, Wilmington, Del. Contractors—Turner Construction Co., Philadelphia, Pa.*



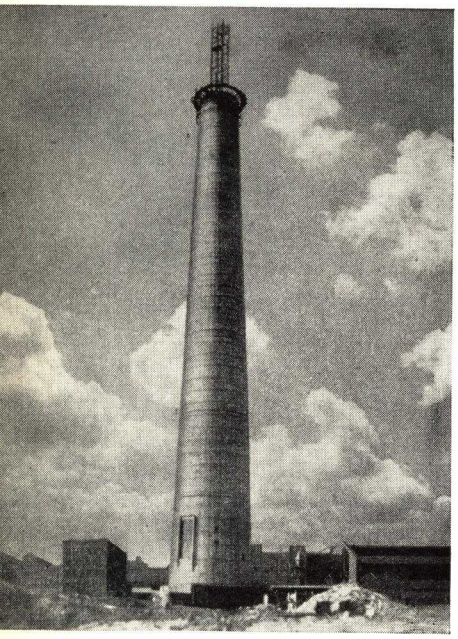
● *Industrial Rayon Corporation, Painesville, Ohio. Architects—Wilbur Watson & Associates, Cleveland, Ohio. Contractors—Hunkin, Conkey Construction Co., Cleveland, Ohio.*

IN CANADA The Master Builders Co. Ltd.
TORONTO, ONTARIO



● *Westinghouse Electric Flood Control Project, East Pittsburgh, Pa. Works Architect—John George. Works Engineer—J. E. Webster.*

● *Wolferman's Store, Kansas City, Mo. Engineer —E. W. Tanner, Kansas City, Mo. Contractor— Long Construction Co., Kansas City, Mo.*



● *International Nickel Company Chimney. Pozzolith Concrete. Built by Custodis Canadian Chimney Company.*

POZZOLITH

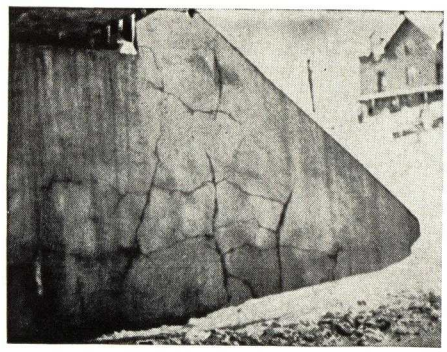
● Since the introduction of the water-cement ratio law governing the strength and durability of concrete, the necessity for using comparatively low water ratio mixes has been generally recognized. Of greatest importance, however, has been the necessity of producing such mixes with a degree of workability which would insure their easy and economical placing and compacting. Pozzolith, *and much less water*, produces concrete of exceptional placeability—a dense, durable concrete highly resistant to the disintegrating attack of freezing and thawing and corrosion. Pozzolith, added to any practical mix, "automatically" forces a reduction in the amount of gauging water—for if the gauging water is not reduced the mix will be too "wet" for practical purposes. To any mix, even a very dry mix, Pozzolith imparts a plasticity and cohesiveness that make for speedy, economical placing, for freedom from honeycombing and segregation. On a growing list of the nation's important projects Pozzolith is daily demonstrating its ability to build better, more placeable concrete *with much less water.* An added feature of extreme importance to many jobs is the early effective pozzolanic activity of Pozzolith which adds a stubborn resistance to attack by corrosion.

SPECIFICATION

Master Builders Pozzolith shall be added to the mix in proportions of 2 lbs. per sack (cubic foot) of cement, exactly in accordance with the manufacturer's directions.

WHY LESS WATER?

In a cubic yard of concrete, approximately two and one-half gallons of water per sack of cement are required to hydrate the cement. Any water in excess of that amount must be regarded as "placing" water, merely providing sufficient workability to make the mix placeable. This excess water occupies about 10% of the total space in concrete. As it evaporates, it causes the concrete to shrink, as exemplified by the cracked surface of the concrete shown to the right. Pozzolith permits a reduction of as much as 20% of this excess water! Result—much more durable concrete.



The Master Builders Company
CLEVELAND, OHIO

LESS WATER, YET MORE PLACEABILITY IN ALL CONCRETE MIXES . . . MORE DURABLE, WATERTIGHT CONCRETE

INDEPENDENT LABORATORY TESTS

THOMPSON & LICHTNER CO., Inc.
Boston, Mass.

Standard Compression Test of Specimens made in our Laboratory in investigation of Pozzolith, Machine Mixed.

MIX—Dry and loose volumes	Average of 3—6″x12″ Specimens			
	3 days	7 days	28 days	3 Mo.
PLAIN MIX W/C .803; Slump 5 inches 1 part Cement 2.2 part Scituate Sand 3.8 part 1″ Scituate Gravel	1833	2470	3380	3537
POZZOLITH MIX W/C .803; Slump 5½ inches 1 part Cement 2.36 part Scituate Sand 4.09 part 1″ Scituate Gravel	1937	2670	3397	3557

★*Note: Pozzolith mix contains more aggregate.*

ABSORPTION TESTS MADE BY W. M. DUNAGAN
Iowa State College, Ames, Iowa

	PLAIN MIX	POZZOLITH
Note proportions	1c:5.4 agg.	1c:5.4 agg.
W/C Gal./sack	6.1	5.25
Slump	1½″	5″†
% Absorption	6.3	5.3
% Decrease in Absorption		16%

† *Note increased workability in spite of water reduction.*

Note proportions	1c:3.7 agg.	1c:4.2 agg.★
W/C Gal./sack	5.25	5.25
Slump	7″	7″
% Absorption	6.1	5.3
% Increase in Aggregate		13½%
% Decrease in Absorption		13%

★*Note increased leanness of mix.*

CANADIAN INSPECTION AND TESTING CO., LTD.

All batches made to slump 5″ to 5½″

Compressive Strength at 7 and 28 Days

Plain			POZZOLITH		
Mix "A" lbs.	7 day	28 day	Mix "A" lbs.	7 day	28 day
Cement 365			Cement 370		
Sand 1410	1165	1670	Sand 1415	1585	2095
Gravel 1930			Gravel 1940		
Water 304			Water 277		
Plain			POZZOLITH		
Mix "B" lbs.			Mix "B" lbs.		
Cement 445			Cement 445		
Sand 1340	2110	2585	Sand 1350	2795	3265
Gravel 1970			Gravel 1975		
Water 290			Water 265		
Plain			POZZOLITH		
Mix "C" lbs.			Mix "C" lbs.		
Cement 525			Cement 525		
Sand 1270	2530	3340	Sand 1275	3570	4525
Gravel 1990			Gravel 2000		
Water 290			Water 266		
Plain			POZZOLITH		
Mix "D" lbs.			Mix "D" lbs.		
Cement 600			Cement 600		
Sand 1180	3000	3845	Sand 1185	4020	4910
Gravel 1995			Gravel 1990		
Water 293			Water 272		
				7 day	28 day
Average Increase in Strength with Pozzolith				30%	25%

ABSORPTION TESTS

"The concrete mixes with Pozzolith had an average absorption of 15 to 20 per cent under that of corresponding plain concrete mixes. The 1:2 and 1:3 mortar mixes containing Pozzolith had an average decreased absorption of approximately 20 per cent."

Report of Loring O. Hanson, Registered Professional Engineer The University of Wisconsin, Madison, Wisconsin.

"We have used Pozzolith in the concrete on several projects and find that it is possible to materially decrease the volume of water required to produce a placeable concrete."

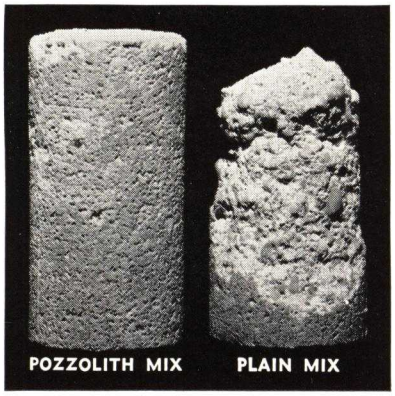
Morris-Knowles, Inc.,
Pittsburgh, Pa.

"I have not seen a finer piece of concrete work than the contractor produced on the Mansfield Sewage Disposal Plant with Pozzolith. Not one area of honeycombed concrete showed on the surface and no excessive amount of puddling was required."

George B. Sowers,
Consulting Engineer,
Cleveland, Ohio

"On the St. Charles filtration plant job Pozzolith enabled us to make a substantial reduction in water while maintaining full strength and increasing the plasticity and workability of the mix."

Russell & Axon,
St. Louis, Mo.

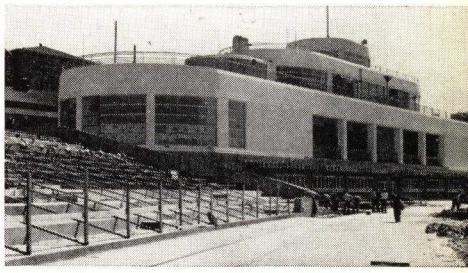


200 CYCLE FREEZING AND THAWING TEST PROVES POZZOLITH BUILDS DURABILITY

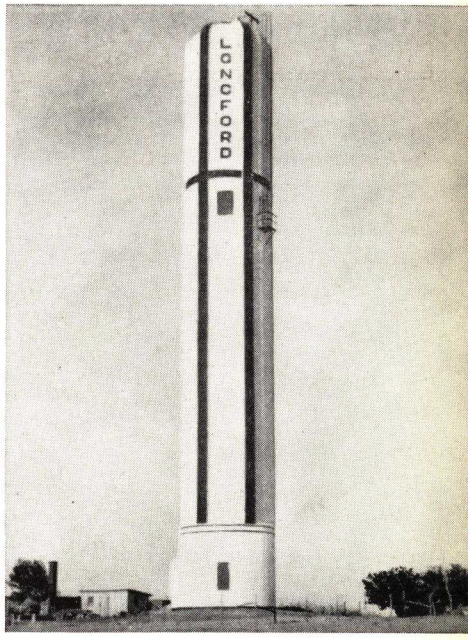
The illustration to the left shows the results of a 200 cycle freezing and thawing test. This test indicates the comparative durability of plain and Pozzolith-fortified concrete. After the test, the Pozzolith cylinder had lost only 2% in weight . . . the plain cylinder lost 22.9%! Figuring 8 cycles per year, this test approximates 25 years of outdoor exposure.

● *House of David Cold Storage Warehouse, Benton Harbor, Mich. Architect—William Wright. Associate—R. F. Huxman.*

● *Des Moines Sewage Disposal Plant, Des Moines, Iowa. Engineer—J. W. Tippee, Des Moines, Iowa.*



● *Aquatic Park Pavilion, San Francisco, Cal. Supt. of Construction—LeRoy B. Frazier.*



● *Longford Watertank, Longford, Kan. Engineers —Paulette & Wilson Engr. Co., Salina, Kan.*

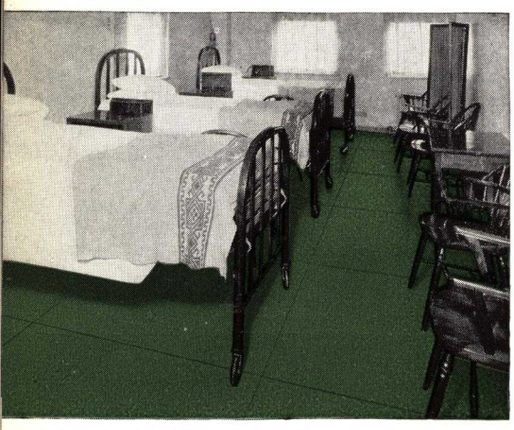
IN CANADA The Master Builders Co. Ltd.
TORONTO, ONTARIO

● *Colored concrete floors are ideal for roof decks, terraces, drives, basement and recreation room floors, etc. Durability and beauty are assured by the new Colormix-KuroKrome method.*

COLORMIX AND METALICRON COLORS

NILE GREEN	FRENCH GRAY
TERRA COTTA	SEAL BROWN
BATTLESHIP GRAY	BLUE
PERSIAN RED	TILE RED
RUSSET	MAROON

Also Available in Black and White



● *Bright cheerful colors . . . easily kept clean . . . no repeated repainting. Surface resists action of strong cleaning solutions.*

THE *New*

WITH THE NEW KUROKROME ELEMENT" IN COLORED

● Two significant improvements in the Colormix Method of installing and finishing colored concrete releases for wide and general use, something builders have long wanted—colored concrete floors, *easy to install correctly.*

By means of a simple technique, the New Colormix Method overcomes the difficulties that have handicapped colored floor construction and does so at a new low cost which sets a record for economy in this class of decorative floors. This is accomplished by improvements in Colormix, which is now in dry form, more efficient and easier to use, and by the New KuroKrome process of curing, protecting and finishing.

Laying a colored floor is greatly simplified by the New Colormix-KuroKrome Method and the difficulties due to the "human element" are practically eliminated. While first-class workmanship in the finishing operation always pays and its absence heretofore meant indifferent results, with the New Colormix-KuroKrome Method, satisfactory results are secured even where only average workmanship is available, because imperfections and variations in color are overcome by the KuroKrome process.

As soon as the fresh colored concrete surface has hardened—in any event not later than the morning following the finish troweling—this remarkable penetrating surface-sealer, colored to match the Colormix, is brushed into and over the fresh floor. The KuroKrome curing coat dries rapidly producing the early curing and protection that assures best results.

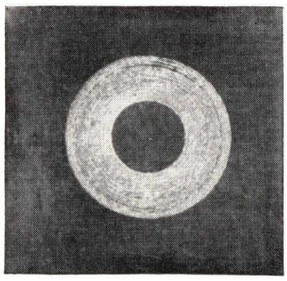
These important results are described on opposite page.

NEW COLORMIX MORE EFFICIENT

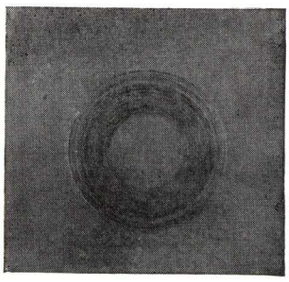
Colormix is now produced as a fine dry powder of intense dyeing power, producing deep, stable shades with a minimum quantity of inert oxides. In addition to the clear, lime-proof color, it contains Master Builders Omicron, the unique water-reducing agent, which eliminates 30% of the excess water used in ordinary floor mixes. This assures much higher strength, minimum porosity, freedom from shrinkage cracking. In other words, durability built into the floor along with the life-long beauty.

KUROKROME—FAR GREATER WEAR-RESISTANCE

PAINTED SURFACE



KUROKROME FINISH

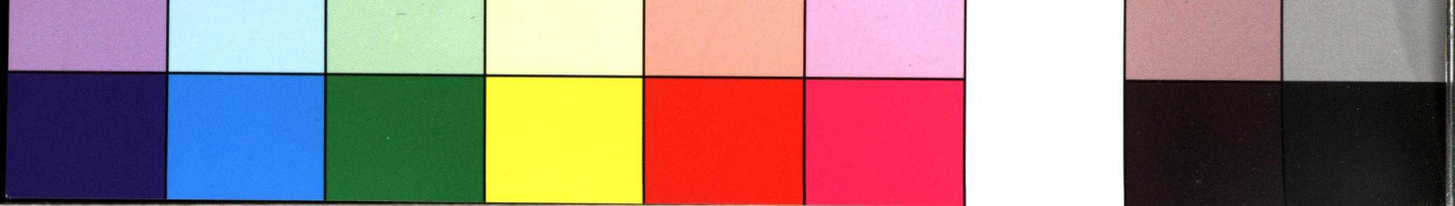


● Under severe abrasion, KuroKrome is many times more resistant to wear than the best paints or coatings.

Abrasion quickly wears through the painted surface (see left view) but merely polishes the resistant KuroKrome finish (see view to the right). That is why KuroKrome floors withstand unusual abuse and wear.

The Master Builders Company
CLEVELAND, OHIO

Inches 1 2 3 4 5 6 7 8
Centimetres 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
TIFFEN® Color Control Patches © The Tiffen Company, 2007
Blue Cyan Green Yellow Red Magenta White 3/Color Black



COLORMIX FLOOR

METHOD OVERCOMES THE "HUMAN CONCRETE FLOOR CONSTRUCTION

KUROKROME DRIES RAPIDLY

(1) Providing an air-tight seal which holds the moisture in the concrete; no other means of curing compares with this method in efficiency. (Tests show it second only to moist closet curing in its beneficial effect on concrete);

(2) Checking any chance for salts or efflorescence to mar the color;

(3) Dyeing out any imperfections or non-uniformity;

(4) Preventing absorption of stains from plaster droppings, tobacco-juice, oil or dirt, by which all new floors are beset for weeks;

(5) Providing the smooth, non-slip surface essential in a decorative floor.

This vital protection is afforded in one easy operation—through the action of this remarkable material, KuroKrome, unique in its affinity for wet concrete. By reason of its early application to the fresh floor (where any ordinary coating would be destroyed) it becomes a unit part of the floor and produces a surface with uniform, deep, non-slip color.

And finally, when the floor is opened to use, the KuroKrome finish does not have to be polished or waxed. The ordinary building paper which has been laid to protect it from the traffic encountered in building operations is removed, dirt on the surface brushed, scraped, or washed off with clear water, and the new Colormix Floor is ready for use. Only if a high gloss finish is desired need it be polished; in either condition—semi-gloss or high gloss,—it is not slippery.

SPECIFICATION

Cement finish floors shall be colored and hardened by the use of (insert number of pounds) of Master Builders (insert color selected) Colormix per sack of cement, used exactly in accordance with the directions of the manufacturer. When the floor has hardened sufficiently so that it will not be marred, but not later than the morning following after installation, the surface shall be given one coat of Master Builders KuroKrome of corresponding color, applied exactly as per manufacturer's directions. The floor shall then be covered* with ordinary building paper until ready for use.

*Blue floors should not be covered with paper.

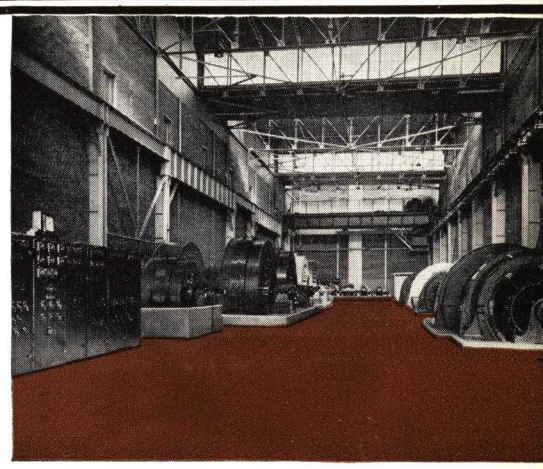
NOTE: Specify *KuroKrome No. 2* for floors subject to solvents such as oils, gasoline, naphtha, hydrocarbons, etc., as in gasoline stations, garages, laboratories, etc.

COLORS

Colormix and KuroKrome are supplied in the colors shown on page eight.

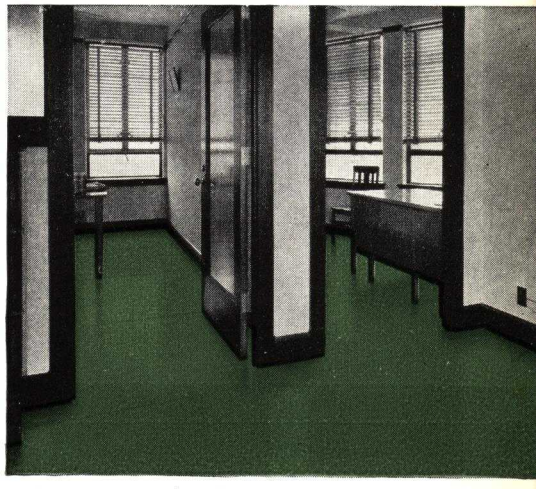
AMOUNT REQUIRED

Colormix shall be used in the following proportions per sack of cement: Battleship Gray, Black, and Russet, 5 lbs. All other colors, 10 lbs. KuroKrome—1 gal. (U.S.A.) covers 500 sq. ft.



● *This Masterbuilt colored concrete floor in the power room of the world's largest and widest hot and cold strip mill represents the ideal floor for the show places of industrial plants.*

● *The next morning after final troweling, before the fresh, full-colored floor starts to dry, one coat of KuroKrome in corresponding color is applied with a soft bristled brush. Its affinity for the wet concrete, of which it becomes a part through penetration, provides perfect curing, complete protection. KuroKrome is insurance of uniform color and perfection in the finished job.*



● *Colored concrete floors in office buildings pay dividends. This floor pays for itself every two years by eliminating annual or semi-annual painting.*

IN CANADA The Master Builders Co. Ltd.
TORONTO, ONTARIO
MASTERBUILT PRODUCTS

• *Colored Masterbuilt floor in Otis Elevator Co. office, Yonkers, N. Y. The custom in the past was to paint such floors. Good practice now calls for building color into the floor and thus save the yearly repainting costs.*

• *Metalicron floor and service area of station of Gulf Refining Company, Miami, Fla. Waterproof, hardened and colorfast. Protected against stain and corrosive action of oil and grease drippings.*

• *Dycrome provides character and unusual beauty for concrete floors, new or already installed. Especially popular is the duo-tone effect, shown above, which is possible with Dycrome.*

COLORED METALICRON

HARDENS AND COLORS FLOORS BY LOW COST, DUST-COAT METHOD

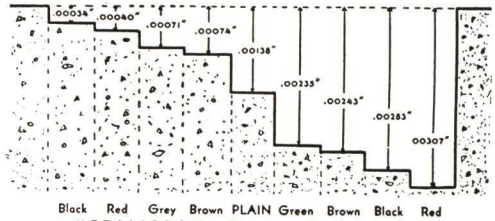
● Colored Metalicron is a dry compound of superfine colors, Omicron and tough, wear-resisting aggregate. It produces an integrally colored wearing surface that is non-absorbent and highly wear resistant.

Colored Metalicron type of finish has been standard for over 20 years. Thousands of these floors from 5 to 20 years old are in service today. The method of installation is well known to experienced floor finishers and therefore can be specified with full confidence.

Initial cost less than that of two coats of paint—year by year cost incomparably lower.

CHARACTERISTICS—1. Two or three times more wear resistant than plain cement finish.
2. Omicron ingredient protects colors from clouding and efflorescence.
3. Omicron ingredient resists attacks of alkali solutions and corrosive agents.

STRENGTH—Abrasion tests show that Colored Metalicron floors are two to three times more wear-resistant than plain cement finish. Twenty-eight-day concrete slabs subjected to abrasion show the relative strength of—(a) plain concrete, (b) concrete colored with high grade commercial oxides, and (c) concrete colored and hardened with Colored Metalicron.



Tested and Reported by James H. Herron Company, Testing Engineers and Chemists, Cleveland, Ohio

USES—Recommended for use either in separate top finish or where topping is omitted and base is finished off as a wearing surface ("monolithic").

For

Office Buildings	Garages	Service Stations
Loft Buildings	Basements	Salesrooms
	Sidewalks	

NON-SLIP—A special formula of Colored Metalicron with non-slip aggregate is manufactured for use in finishing colored ramps, corridors, stairs, wet areas where slip-proof surface is desirable.

SHORT SPECIFICATION

The concrete floors shall be colored and hardened with Master Builders* Colored Metalicron using no less than 30 lbs. of Colored Metalicron and 22 lbs. of cement for each 100 square feet of surface, applied in accordance with the directions of THE MASTER BUILDERS COMPANY.

**If non-slip feature is desired, insert words "non-slip."*

DYCROME

COLORS AND HARDENS FLOORS IN PLACE

● Dycrome provides an unusual technique for permanently coloring and hardening existing *plain* concrete floors. Finish provided is permanent because colors are etched into the surface. Colors include Flemish Oak, Weathered Bronze, Cordovan Brown, Palmetto Green, Nile Green and Jade. Hardens the surface—resists wear and dusting. Cost over period of even few years only a fraction of cost of repeated paintings which wear rapidly.

SPECIFICATION—*Existing Floors*—The concrete floor finish shall be colored and hardened with Master Builders' Dycrome in accordance with the directions of the manufacturer, THE MASTER BUILDERS COMPANY.

Installing New Floors—Mortar for floors to be Dycromed shall be proportioned (mix desired), to which shall be added two pounds of hydrated lime for each bag of cement in the mix.

The Master Builders Company
CLEVELAND, OHIO

MASTERSEAL

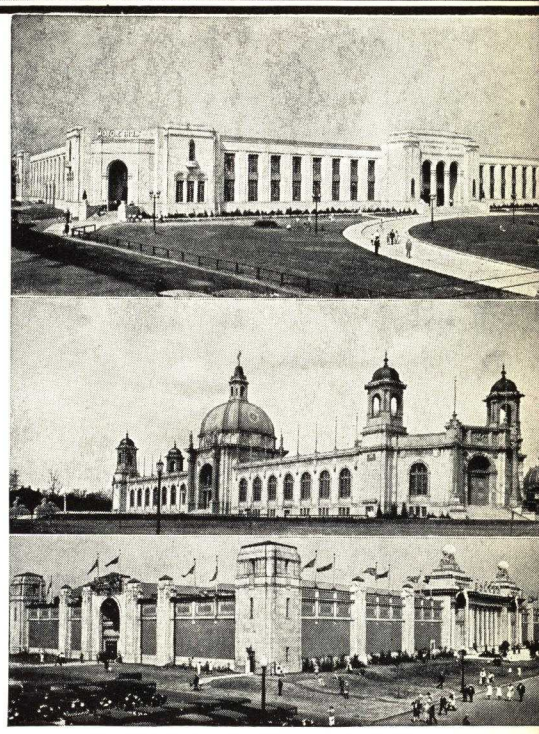
COLORLESS SURFACE WATERPROOFING

● Masterseal waterproofs brick, tile, stucco and concrete without changing the appearance of the surface. It retards disintegration, resists the corrosive action of smoke and fumes and prevents sanding, staining and efflorescence. Two types of Masterseal are available—*All Weather Masterseal* for use on wet or dry surfaces and Masterseal No. 1 and No. 2 for use on dry surfaces only and in temperatures above 50 degrees F.

All-Weather Masterseal may be applied to wet or dry brick surfaces in temperatures down to freezing. It speeds up completion of the job, lowers labor costs, has 2½ times the covering capacity of conventional colorless waterproofings; designed for use on brick surfaces only. For stone, stucco, etc., use Masterseal No. 1 or 2. The latter must be applied in temperatures above 50 degrees F. No. 1 darkens light colored surfaces slightly; No. 2 wholly invisible.

SPECIFICATION—WET OR DRY WALLS—All brick surfaces as indicated on plans shall be treated with Master Builders All-Weather Masterseal, surface waterproofing, following the directions of the manufacturers, THE MASTER BUILDERS CO.

SHORT SPECIFICATION—ON DRY SURFACES ONLY—All surfaces of brick, tile, stucco, stone and concrete as indicated on plans shall be treated with Master Builders (Insert Masterseal No. 1 or No. 2) colorless surface waterproofing following the directions of the manufacturers, THE MASTER BUILDERS CO.



● *Masterseal used to waterproof and preserve these large buildings at the Canadian National Exhibition, at Toronto Ontario.*

STEAROX "30"

WATERPROOFING PASTE FOR MASS CONCRETE AND MORTAR

● Stearox "30" is a pure stearate waterproofing paste containing 30% stearic acid. This was made possible by the discovery of a new process of introducing straight concentrated stearic acid into concrete without the aid of useless adulterants.

F. O. ANDEREGG, AUTHORITY ON INTEGRAL WATERPROOFING, STATES:

"The stearate or stearic acid ingredient is the most effective constituent and the value of commercial waterproofing pastes and powders seems to depend largely upon their stearate content.

"Analyses of commercial waterproofing pastes show great variations in their stearate content. It has been the practice to add substances such as alkalies and ammonia to waterproofing pastes. *A pure stearic acid, if it can be made easily soluble in the mixing water, would be the most desirable.*"

F. O. Anderegg, Ph.D.,
Consulting Specialist on Building Materials.

To insure receipt of full value, the following specification is advisable: "The waterproofing shall be free of non-stearate ingredients, and not less than .6 lbs. of 30% Stearic Acid Paste (or corresponding increased proportion of paste of lesser stearic acid content) shall be used per sack of cement."

Stearox "30" is *pure, unadulterated, and quickly distributed in the mix.*

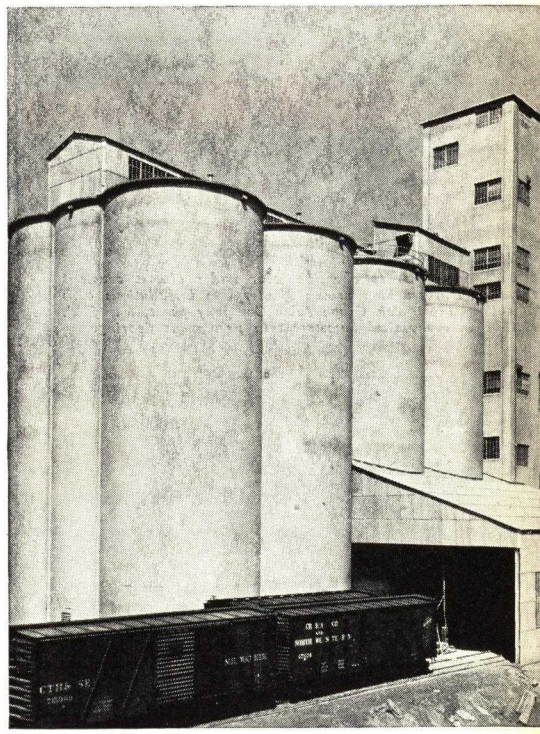
ADVANTAGES: Since authorities agree that stearate content controls waterproofing value, Stearox "30"—which contains 30%—has indisputable advantages when compared with other preparations. One of the most widely used of these contains only 16% stearic acid—another only 3%.

Water absorption of concrete is reduced 60% when Stearox "30" is applied. Tests show not only the lowest total absorption but the lowest rate of absorption, which is equally important.

	1 Hr.	1 Day	Decreased absorption
Plain 1:3 mortar	.9%	1.5%	....
Stearox "30" (.6 lbs. per sack cement)	.3%	.6%	60%
6 brands paste Avge. (1½ lbs. per sack cement)	.53%	.617%	59%
6 brands powder Avge. (2 lbs. per sack cement)	.7%	1.1%	26%

ECONOMIES: Only 3.6 lbs. of Stearox "30" are required to provide standard waterproofing value. This compares with 9 to 36 lbs. of other types.

Handling and transportation charges are lower, because Stearox is more compact than other waterproofing preparations.



● *Penik and Ford's Grain Elevator—Cedar Rapids. Stearox "30" Used Throughout.*

SPECIFICATION: All mass concrete shall be waterproofed integrally by the use of not less than 3.6 lbs. of Master Builders Stearox "30" waterproofing paste per cubic yard of concrete used exactly in accordance with the directions of the manufacturers, THE MASTER BUILDERS CO.

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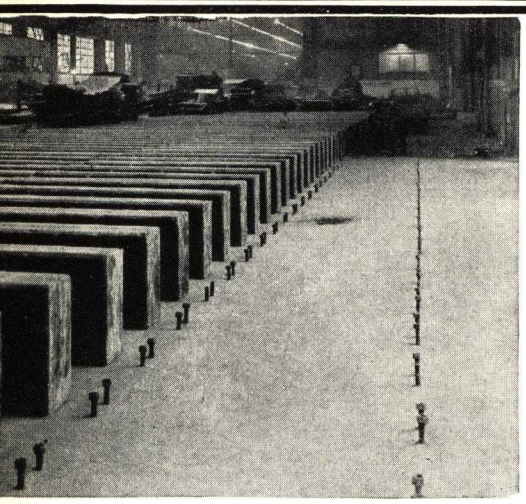
TORONTO, ONTARIO
MASTERBUILT PRODUCTS



● *Large areas of Masterplate floor stand up under tremendous weight and abrasive wear in this division of the Wheeling Steel Co. plant, at Steubenville, Ohio.*

● *High resistance to abrasive wear under almost constant shipping and trucking proves Masterplate installations such as this at the Welch Grape Juice Company plant, Westfield, N. Y., an economical investment in permanent flooring.*

SPECIFICATION

All surfaces as indicated on plans shall be given two coats of Master Builders (insert color) Mastertex, waterproof cement coating, following the directions of the manufacturers, THE MASTER BUILDERS COMPANY.

MASTERPLATE

THE "DEEP METALED" CONCRETE FLOOR FOR HEAVY INDUSTRY

● The Masterplate floor is a dense, low-water ratio concrete finish with up to 120 lbs. of tough wear-resisting metallic aggregate per 100 sq. ft. This is 2 to 4 times more metal than it has been possible to use by the best previous methods. Masterplate is the 'Super Concrete Finish' that heavy industry has long sought.

This increased amount of metal is made possible by an exclusive new water-reducing plasticizer which makes it easy and practical to incorporate 120 lbs. of Masterplate in the surface of a 'dry mix.'

The operation is further facilitated and results made sure by Master Builders perfected mechanical technique which automatically secures the proper results; much of the costly, variable manual work is eliminated.

Where 30 to 50 pounds of regular Metallic Hardener have been the limit that could be used heretofore (attempts to use more have led to use of an excessive amount of water, which cuts strength and density), you can now have 80, 100 or 120 lbs. of Masterplate—many times more wearing service!

Masterplate is a combination of Master Builders *pure* water absorbent, carefully graded Metallic Hardener plus *Omicron* to give resistance to corrosive agents, *and* the new patented water-reducing agent which makes practical and easy the use of 120 lbs. of metal per 100 sq. ft.

SPECIFICATION

The concrete floor finish shall be hardened with Master Builders Masterplate using not less than (here insert 80 lbs. to 120 lbs. for heavy duty floors) of Masterplate to each 100 square feet of surface. The Masterplate shall be applied and the floor finished and protected in accordance with directions of THE MASTER BUILDERS CO.

● As always, Master Builders service is available to help builders get exactly the kind of floor today's heavy industries require. Steel mills, paper mills, factories and industries of all descriptions are now installing this long-lived low-maintenance floor that will outwear any concrete floor you have ever seen. Further information on request.

MASTERTEX

CEMENT PAINT FOR MASONRY SURFACES

● Paints or coatings containing oils will not adhere to wet masonry surfaces. If applied to dry walls that later become wet they saponify and come off. Glues, caseins, etc., are not durable or subject to resistance and alkaline conditions.

Mastertex waterproof cement paint, specially designed for exterior and interior coating of concrete, brick, tile, stucco, stone and other masonry, is applied directly to the wet surface, forms a permanent bond, becomes a part of the wall. It will not blister, peel or flake and its hardness increases with age and with successive wetting. It can be washed or brushed clean repeatedly without being injured.

Not designed for use on floors or on vitrified, enameled, magnesite, gypsum, or lime surfaces.

Standard Colors: *Cream, Ivory, Green, Blue, Light Grey, French Grey, Dark Grey.*

● Only type of coating that adheres firmly to damp basement walls, swimming pools, garden pools, tanks, tunnels, and other masonry subject to constant moisture. Recommended for inside white on all masonry surfaces, particularly in dairies, laundries and other plants subject to steam, fumes and humidity.

The Master Builders Company
CLEVELAND, OHIO

METALICRON

FOR AVERAGE INDUSTRIAL FLOOR TRAFFIC . . .

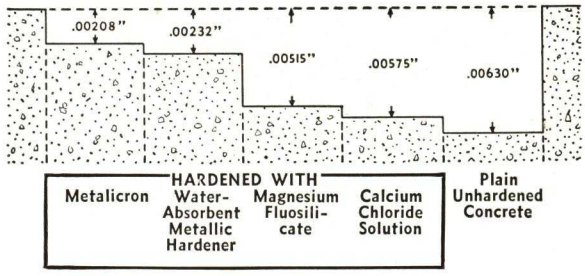
● Wear resistance "teams up" with corrosion resistance in Metalicron hardened concrete floors to create long-lived, economical concrete floors for average industrial use. More than twenty-five years of experience have established the superiority of Metalicron floors, for not only does Metalicron provide a hard, long-wearing "iron" surface but it also provides through its Omicron ingredient a surface impervious to the destructive action of cutting oils and alkalies common in practically every industry. Metalicron is easy to apply, easy to finish and free from dusting and crazing. The list of Metalicron users reads like a "Who's Who" of American industry. Sent on request.

NON-SLIP METALICRON

The Standard formula is changed to include non-slip aggregate. Specify "Non-Slip Metalicron" for use on ramps, stairs and other areas where non-slip finish is desired.

ABRASION CHECKED

Concrete specimens subjected to abrasion tests show following relative wear resistance:



SPECIFICATION

The concrete floor finish shall be hardened with Master Builders Metalicron, using not less than [here specify 30, 40, 50 or 60 (maximum) lbs. per 100 sq. ft. according to weight of traffic to be carried] of Metalicron to each 100 square feet of surface. The Metalicron shall be applied and the floor finished and protected in accordance with directions of the Master Builders Co. (If the non-slip finish is desired, insert the words "Non-Slip" before the word "Metalicron.")

MASTER MIX

FOR COMMERCIAL and LIGHT DUTY INDUSTRIAL FLOORS

● Master Mix has been the standard integral floor hardener and waterproofer for commercial and light industrial concrete floor finish since 1915.

Ideal for office buildings, laundries, auditoriums, lofts, schools, garages, and similar areas subject to heavy foot traffic or light trucking.

IMPORTANT CHARACTERISTICS

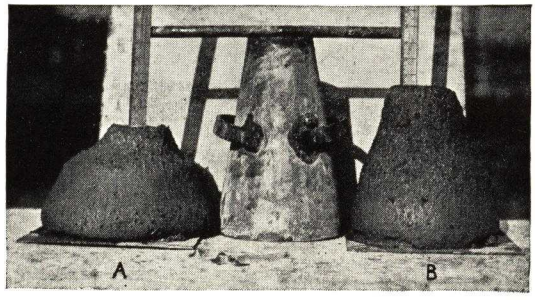
1. By virtue of its Omicron content, it *reduces* shrinkage while *increasing* plasticity with *reduced* water-cement ratio. The proven result is a dense hard and non-dusting floor.

2. Master Mix Floors are not affected by mild corrosives because Omicron combines with a substantial portion of free lime *throughout* topping.

SPECIFICATION

All concrete floor finish as designated shall consist of one part standard Portland cement and two parts clean sharp sand and shall be hardened with Master Builders Master Mix used in the proportion of two pounds of Master Mix to every bag of cement. For industrial light duty areas the concrete floor finish shall consist of one part Portland cement and 1½ parts clean, sharp sand and 1½ hard pea gravel or crushed stone graded up to ⅜ inch. Not over 5 gallons of liquid shall be used per sack of cement. Place, finish and protect in accordance with directions of the Master Builders Co.

HOW MASTER MIX IMPROVES WORKABILITY



"A" with MASTER MIX—"B" without MASTER MIX

1 part cement to 2 parts sand, 4¼ gal. water plus 2 lbs. of Master Mix. SLUMP, 6½".

1 part cement to 2 parts sand, 4½ gal. of water. SLUMP, 3".

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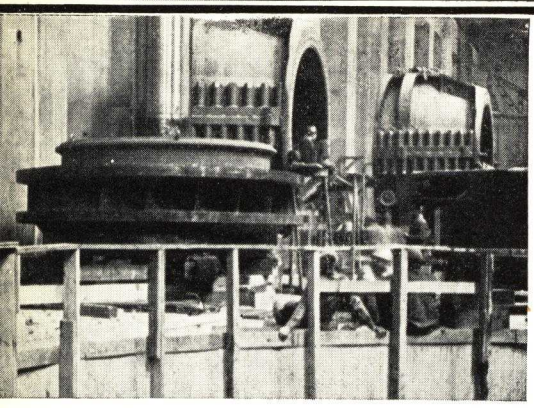
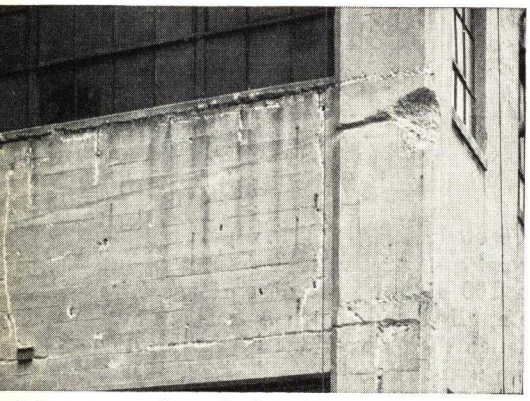
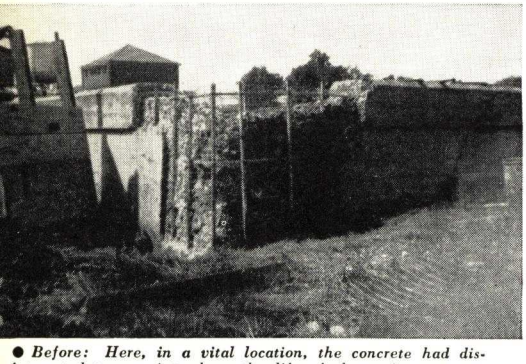


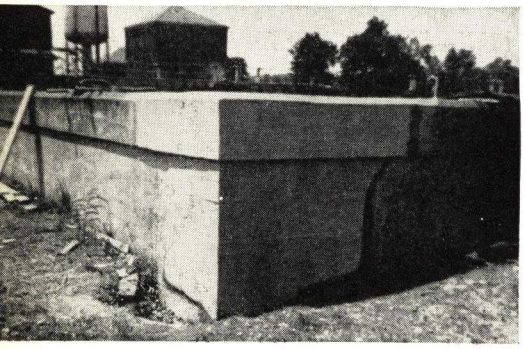
● *At Boulder Dam, massive generating equipment is grouted with Non-Shrink Embeco.*



● *Preparatory work completed, ready for restoration with Non-Shrink Embeco. Continental Can Co. plant, Baltimore, Md.*



● *Before: Here, in a vital location, the concrete had disintegrated to a point where the life of the entire structure was endangered.*



● *After: Embeco repair creates a new wall, stronger, more durable than the original concrete! Perfect bond between old and new concrete. No shrinkage!*

NON-SHRINK EMBECO METHOD

FOR GROUTING—REINTEGRATION—REPAIR

● Embeco is a metallic aggregate which wholly *eliminates shrinkage in concrete.* Since its development sixteen years ago, Embeco has become the standard specification for grouting, repairing and reintegration in the nation's major industries. An increase of 50% in strength results from the use of Embeco and shrinkage cracks do not appear in mortars whether placed by hand or pressure gun equipment. To the architect or engineer faced with the problem of restoring concrete structures, Embeco offers a safe, simple method of obtaining excellent results.

CONCRETE BUILDING RESTORATION BY EMBECO METHOD

The non-shrink Embeco method of concrete building restoration has proved successful in many cases where other products and methods have failed. So completely does Embeco eliminate shrinkage that patches and repairs made with it create a perfect bond and a completely sealed base for finishing mortars. Among the hundreds of jobs on which Embeco was used are found the names of many of the nation's leading industries. Time tried, proven, it has steadily grown in favor and acceptance among architects and engineers until today it enjoys leadership in its field.

SHRINKAGE ELIMINATION MEANS PERFECT BONDING, PERFECT REPAIRS

The unique ability of non-shrink Embeco to completely eliminate shrinkage in concrete has enabled maintenance engineers in the nation's major industries to create really permanent restoration of concrete walls, floors, buildings, grouts, etc. Because non-shrink Embeco does eliminate shrinkage, it forms a perfect bond with the old concrete to which it is applied, building tremendous strength and durability into the original structure. Easy, economical to use, non-shrink Embeco has become a standard specification in the repair and maintenance work of many great industries, railroads and public utilities.

COMPLETE PICTORIAL SPECIFICATIONS FOR ALL TYPES OF WORK

To simplify the task of the maintenance crew, Master Builders have produced a book of pictorial specifications, showing the step-by-step procedure in the correct use of non-shrink Embeco. So complete and effectively illustrated is this book that we have been forced to re-issue it a number of times to meet the demand of those who wish to know more about this exceptional product. A copy is yours for the asking.

GROUTING—Machinery, columns, floor grids, etc.

REPAIRS—Heavy duty floors, ramps, platforms.

REINTEGRATION—Buildings, bridges, dams, etc., by hand-placed or gunned methods.

The Master Builders Company
CLEVELAND, OHIO

OTHER MASTER BUILDERS PRODUCTS

Detailed descriptions, technical data and specifications on any of these products sent upon request

KURO

Kuro is a remarkable, new liquid curing coat with an affinity for fresh concrete which permits application to mass concrete surfaces immediately after form stripping and to floors the day following installation.

Non-colored and inconspicuous, it seals the surface completely, thereby insuring thorough curing. Shown by test to be second only to "moist closet curing" in beneficial effect.

Brushed or sprayed in one coat, covering 1,000 sq. ft. per gallon (U.S.A.)

SANISEAL

For Floors Already Installed

Master Builders Saniseal is a powerful chemical hardener, which when mixed with water and brushed into the floor surface, deposits in the pores a hard, wear-resisting crystal. This arrests dusting and hardens the surface.

Saniseal is designed as a maintenance or corrective treatment for floors already installed. Not less than 2 lbs. of Saniseal should be used per 100 sq. ft.

CONCRETE PRESERVATIVE

Protects concrete from the attack of reagents which ordinarily cause rapid deterioration, such as solutions of alkalies, acids and salts. It is a moderately viscous amber liquid of a non-volatile synthetic base, which, when applied on any dry concrete surface, penetrates and fills the pores with a waterproof corrosion resistant. An excellent alkali-resisting priming coat for oil paints to be used on concrete or masonry, as it waterproofs, forming a strong bond between paint and concrete, preventing blistering and peeling. Concrete Preservative is recommended for application to all concrete exposed to severe corrosive conditions, such as floors in food manufacturing plants, bakeries, laundries, concrete tanks and vats, sewers, silos, bottling plants.

METALLIC WATERPROOFING

Master Builders Metallic Waterproofing is applied to either inside or outside wall surfaces, usually the inside surface. It permanently seals all pores and cracks, and provides a water-tight metal-cement sheath that defies time and elements. Applied as successive brush coats or as a plaster coat, or both, as conditions require.

Metallic Waterproofing is used widely instead of the more expensive and difficult membrane method. One great advantage is the ease with which structural cracks or leaks are located and cheaply repaired. Metallic Waterproofing is a permanent seal for repairing and reintegrating masonry and concrete structures.

BONDING IRON

For Bonding Separate Top Finish to Hardened Concrete Slab

Bonding to a set slab is largely a matter of workmanship, but results are surer when Master Builders Bonding Iron, specially designed for this purpose, is used. Bonding Iron is applied in a one-coat treatment to the base slab after the surface has been roughened and thoroughly cleaned and saturated with water. The coat oxidizes, providing a waterproof sheath that prevents the dry base from drawing moisture from the topping and provides an additional mechanical key. Approximately 15 pounds per 100 square feet required.

Specification

Where a cement finish is to be applied to a set slab, the slab shall be thoroughly roughened with picks and broom cleaned; slab shall then be saturated with water, and a grout of Master Builders Bonding Iron shall be applied exactly in accordance with directions of the manufacturers, The Master Builders Co.

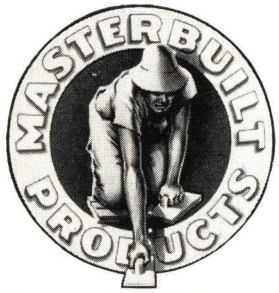
OTHER PRODUCTS

Caulking Compound—in nine colors and natural.

Plaster Bond—a black, bituminous base adhesive paint.

Foundation Coating—a hydrocarbon waterproofing applied cold to below grade masonry.

IN CANADA The Master Builders Co. Ltd.
TORONTO, ONTARIO



and Services Available Everywhere

Regardless of your location, there is a Master Builders Field Engineer located nearby to give you prompt, expert assistance in the solution of any problem in the field of concrete or masonry. Please feel free to call upon the representative nearest you for any cooperation.

MASTER BUILDERS BRANCH OFFICES

ATLANTA, GA., 511 Bona Allen Bldg.
Telephone: Walnut 8927
BALTIMORE, MD., 3312 Moravia-Ave.
BOSTON, MASS., 80 Boylston St.
Telephone: Liberty 3351
BUFFALO, N. Y., 154 West Huron St.
Telephone: Cleveland 5410
CHICAGO, ILL., 228 No. LaSalle St.
Telephone: State 4175
COLUMBUS, OHIO, 12 No. 3rd Street
Telephone: Adams 6865
DALLAS, TEX., 612 Construction Bldg.
Telephone: 7-3423
DETROIT, MICH., Michigan Bldg.
Telephone: Cadillac 5587
INDIANAPOLIS, IND., 310 No. Illinois St.

KANSAS CITY, MO., 523 Dwight Bldg.
Telephone: Grand 0940
LOS ANGELES, CAL., 201 Wm. Fox Bldg.
Telephone: Vandyke 1619
MIDDLETOWN, CONN., Central Nat. Bk. Bldg.
Telephone: Middletown 1003
MIAMI, FLA., 507 N. E. 1st Ave.
Telephone: Miami 3-4511
MILWAUKEE, WIS., 774 No. Broadway
Telephone: Marquette 3019
MINNEAPOLIS, MINN., 703 Third Ave. So.
Telephone: Atlantic 4803
MONTREAL, QUE., 1434 St. Catherine St. W.
Telephone: Plato 6720
NEW YORK, N. Y., 101 Park Ave
Telephone: Ashland 4-0160

PHILADELPHIA, PA., Lena and Armat Sts.
Telephone: Rittenhouse 2231
PITTSBURGH, PA., P. O. Box 115
Telephone: Wellington 2260
ROCK ISLAND, ILL., 721 34th St.
Telephone: Rock Island 3119
ST. LOUIS, MO., 3548 So. Grand Blvd.
Telephone: Grand 5511
SAN FRANCISCO, CAL., Rialto Bldg.
Telephone: Sutter 1100
TORONTO, ONT., 96 Bloor St. W.
Telephone: Randolph 6575
WASHINGTON, D. C., 807 Chandler Bldg.
Telephone: National 6303
WEST LAWN, PA., 2115 Highland St.
Telephone: Reading 81-9823

REPRESENTATIVES

ABILENE, TEX.
West Texas Tile Co.
AKRON, OHIO
Loomis Coal & Supply Co.
ALBUQUERQUE, N. M.
A. R. Losh Co.
AMARILLO, TEX.
Crowe Lime & Cement Co.
AUGUSTA, GA.
Augusta Building Supply Co.
BALTIMORE, MD.
Monumental Brick & Supply Co.
BINGHAMTON, N. Y.
Binghamton Slag Roofing Co.
BIRMINGHAM, ALA.
Thomas Supply Co.
BUFFALO, N. Y.
Globe Plaster Co.
CALGARY, ALTA.
Bell & Morris
CHAMPAIGN, ILL.
Morris L. Hecker Co.
CHARLESTON, W. VA.
Standard Brick & Supply Co.
CHARLOTTE, N. C.
A. L. Simpson
CINCINNATI, OHIO
Cinder Products, Inc.
COLUMBIA, S. C.
F. D. Owen
CUMBERLAND, MD.
Young Sales & Engr Co.
DALLAS, TEX.
Macatee, Inc.
DANVILLE, ILL.
Builders Supply Co.
DENVER, COLO.
Rocky Mountain A. & B. Service
DUBUQUE, IOWA
Baumgartner Sales Service
EL PASO, TEX.
El Paso Building Material Co.
EVANSVILLE, IND.
John L. Newman Co.
FLINT, MICH.
Advance Engineering & Sales Co.
FT. SMITH, ARK.
Harry G. Barr Co.
FT. WAYNE, IND.
Jones & Moss
FT. WORTH, TEX.
Sloan Lumber Co.
GALESBURG, ILL.
Builders Supply Co.
GREEN BAY, WIS.
The Gagnon Clay Products Co.
GREENVILLE, S. C.
J. C. Plowden
HAGERSTOWN, MD.
Victor Cushwa & Sons
HAMILTON, ONT.
Olmstead & Parker
HELENA, MONT
R. C. Grant
HOUSTON, TEX.
Bowles & Stoy
HUNTINGTON, W. VA.
Mossman Bros. Co.
INDIANAPOLIS, IND.
Spickelmeir Fuel & Supply Co.
JACKSON, MISS.
Fred Thrasher
JOHNSTON, PA.
John W. Walters Co.
KANSAS CITY, KAN.
A. C. Cooke Coal & Cement Co.
KANSAS CITY, MO.
C. A. Brockett Cement Co.
KOKOMO, IND.
Hansell Coal Co.
LA CROSSE, WIS.
Meir Brick Co.
LANCASTER, PA.
J. C. Budding Co.
LANSING, MICH.
Briggs & Company
LEXINGTON, KY.
Clay-Ingels Co.
LIMA, OHIO
Kelly Coal & Supply Co.
LINCOLN, NEB.
Western Brick & Supply Co
LITTLE ROCK, ARK.
Neville C. Withrow Co.
LOUISVILLE, KY.
American Builders Supply Co.
LUBBOCK, TEX.
Caylor Brick & Supply Co.
MANSFIELD, OHIO
Kalmerton & Baer
MEMPHIS, TENN.
Fischer Lime & Cement Co.
MILWAUKEE, WIS.
Wisconsin Face Brick & Supply Co.
MOLINE, ILL.
Moline Consumers Co.
MONTREAL, QUE.
Webster & Sons, Ltd.
NASHVILLE, TENN.
E. Spencer Benton
NEW LISKEARD, ONT.
Hill-Clark-Francis, Ltd.
NEW ORLEANS, LA.
Clifford A. King, Jr.
NIAGARA FALLS, N. Y.
Empire Bldrs. Sup. Co.
NORANDO, QUE.
Hill-Clark-Francis, Ltd.
NORFOLK, VA.
Carl F. Woost
OKLAHOMA CITY, OKLA.
Bissell Bldrs. Sup. Co.
OMAHA, NEB.
Earl S. Lewis & Co.
OTTAWA, ONT.
Webster & Sons, Ltd.
PEORIA, ILL.
Faber Musser Co.
PHOENIX, ARIZ.
Walter Dubree
PITTSBURGH, PA.
McCrady Rodgers Co.
PLATTSBURGH, N. Y.
Dock & Coal Co., Inc.
PORT ARTHUR, ONT.
Ernest A. Cuff
PORTLAND, ORE.
McCraken-Ripley Co.
PROVIDENCE, R. I.
H. H. Horton & Co.
QUEBEC CITY, QUE.
Webster & Sons, Ltd.
RICHMOND, VA.
Ruffin & Payne, Inc.
ROANOKE, VA.
Cinder Block, Inc.
ROCHESTER, N. Y.
Geo. A. McNerney
Hutchison-Rathbun, Inc.
ROCKFORD, ILL.
Skandia Lumber Co.
ST. JOHN, N. B.
Gandy & Allison, Ltd.
St. LOUIS, MO.
Heinecke Coal & Materials Co.
ST. PETERSBURG, FLA.
E. L. March
SALT LAKE CITY, UTAH
Williams & Richardson
SAN ANTONIO, TEX.
Rufus A. Walker
SCRANTON, PA.
Supply & Engineering Co.
SEATTLE, WASH.
Tourtellotte-Bradley Co., Inc.
SHREVEPORT, LA.
Builders Supply Co.
SIOUX CITY, IOWA
Sioux City Brick & Tile Co.
SIOUX FALLS, S. D.
Geo. H. Brown
SOUTH BEND, IND
E. R. Newland Co.
SPOKANE, WASH
Building Supply Co.
SPRINGFIELD, ILL.
Henry Nelch & Sons Co.
SPRINGFIELD, MO
Kennedy Brick & Steel Co.
SYRACUSE, N. Y.
F. J. Ludwick
TAMPA, FLA.
Builders Service Co.
TOLEDO, OHIO
Kuhlman Builders Supply Co.
TOPEKA, KAN.
Hargreaves & Company
TRENTON, N. J.
Tattersall Company
TULSA, OKLA.
Bissell Builders Supply Co.
UTICA, N. Y.
American Hardwall Plaster Co.
VANCOUVER, B. C.
The O'Neill Co., Ltd.
WALKERVILLE, ONT.
Kenneth E. Shaw
WASHINGTON, D. C.
A. P. Woodson Co.
WICHITA, KAN.
Spencer Allen Fuel Co.
WICHITA FALLS, TEX.
West Texas Engrg. & Supply Co.
WILKES-BARRE, PA.
W. H. Pierce
WILLIAMSPORT, PA.
Cement Products Co.
WILSON, N. C.
J. L. Lawshe
WINNIPEG, MAN.
Walker's Limited
YORK, PA.
Service Supply Corp.
YOUNGSTOWN, OHIO
Youngstown Ice Co.

THE MASTER BUILDERS COMPANY

7016 Euclid Avenue - - Cleveland, Ohio

IN CANADA: THE MASTER BUILDERS CO., LTD., TORONTO, ONTARIO

Research Laboratories: Cleveland

Factories: Cleveland, Buffalo, Toronto

MINWAX COMPANY, INC.

A Complete Service for Waterproofing and Dampproofing

11 West 42nd Street, NEW YORK, N. Y.

BRANCH OFFICE: CHICAGO, ILL. FACTORY: DELAWANNA, N. J.

PRODUCTS

There is a Minwax product for every condition for which Waterproofing, Dampproofing, Caulking, or Surface Protection may be required. This group of products, some thirty individual materials, has been gradually evolved during the thirty years this Company has specialized in this field. The more important are listed in the following paragraphs.

For our pages on Wood Finishes, Brick and Cement Coating and Alkaloy Basement Floor Paint, see File Index or Paint section.

ENGINEERING SERVICE

Our experience equips us with a special engineering knowledge on the application of our products which we offer without reservations, to those seeking satisfactory results.

We are in a position to recommend experienced, responsible organizations who specialize in the application of Minwax products.

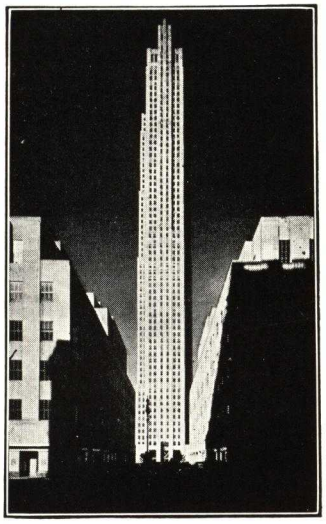
We have representatives in the principal cities; for address consult your local telephone directory.

MINWAX WATERPROOFING, DAMPPROOFING AND CAULKING MATERIALS

MINWAX MEMBRANE WATERPROOFING

Description—Consists of alternate layers of Minwax Waterproofing Asphalt and Minwax Saturated Cotton Fabric, forming a built-up blanket or mat constructed to envelop or cover the portion of the structure to be waterproofed. In placing, the asphalt is heated until it is fluid, mopped on the surface and the fabric placed in the hot mopping. Repeat to the required number of plies. This creates a tough, stretchable elastic membrane that gives maximum protection against leakage due to cracking, temperature or vibration movement.

Uses—*Open or Above Grade Work* —This class may include: terraces, bridge decks under paving, tracks or fill; roofs under tile or masonry wearing course; sidewalks over basements; factory floors, hotels or clubs where dampness may occur; shower stalls, bathrooms; swimming pools; tanks, reservoirs, etc.



Rockefeller Center
REINHARD & HOFMEISTER
CORBETT, HARRISON & MACMURRAY
HOOD & FOUILHOUX, Architects
Minwax Caulking Compound

Foundation or Sub-structure Work—In this class may be included not only basements, but also tunnels, subways, and underground structures generally. A careful study of the design is warranted to provide "proper conditions for application". Our experience is at your disposal.

Note: For dampproofing foundations see Minwax Asphaltic Dampproofings.

Specifications—Membrane shall generally consist of primer, 3-ply fabric and 4 moppings asphalt laid on dry, smooth, solid surface and protected by 1 in. cement mortar. Where minimum quantities are desired, use 2-ply and 3 moppings.

WATERPROOFING FOR WALLS ABOVE GRADE

For new buildings, we recommend centralizing responsibility by specifying under one heading all work necessary to assure weatherproof walls. Minwax materials cover all requirements in such a plan: (a) Waterproof cut-offs under copings or parapets, over window heads and at spandrels; (b) dampproofing inside of outside wall surfaces under plaster; (c) elastic caulking around windows, in copings, cornice, water-table and similar masonry joints; (d) transparent waterproofing for severe exposure, stone protection, etc. Recommendations on specific projects gladly furnished.

MINWAX ASPHALTIC DAMPPROOFINGS

Minwax Dampproofing

For concrete, solid brick or tile masonry above or below ground. A full-bodied, black liquid coating based on Minwax Asphalts, which is combined with special chemically inert solvent to make a material that forms a tacky, plastic, lasting dampproof coating which never hardens, to which plaster will adhere perfectly and which will give maximum protection below ground.

Dampproofing Under Plaster

Modern construction practice places increasing emphasis on the use of a heavy reinforced coating for dampproofing on the inside face of masonry walls under plaster or on the exterior face of foundation walls. The additional protection given by the additional weight of coating has proven a sound investment wherever climate and exposure conditions require positive protection.

The final step in this development of dampproof is Minwax Trowel Dampproofing now rendering effective service on over a million square feet of exposed wall surfaces. This material provides a reinforced asphalt coating $\frac{3}{32}$ in. thick of Minwax Asphalts of great proven permanence which on solid brick or tile backing has proven its ability to meet all the requirements for a positive dampproofing.

Minwax Spray Coat Dampproofing

For protection against "built-in" moisture, and for normal exposures—is the above material in a consistency suitable for spray application or for applying with brush. Use 1 gal. per 100 sq. ft. per coat.

Minwax Fibrous Brush Coat (Brush Mastic)

For additional protection against more severe exposures. This is the same material with the addition of asbestos fibre as a filler and reinforcing agent. It works well under the brush and insures a heavier and more complete film. Use 1 gal. per 70 sq. ft. per coat.

Minwax Trowell Coat Dampproofing

For perfect, complete film and maximum protection. This is again the same material but with the proportion of asbestos fibre increased to bring the material to mastic consistency and insure absolutely complete and continuous film under all conditions. Use 1 gal. for each 12 sq. ft. for $\frac{3}{32}$ to $\frac{1}{8}$ in. coat.

Specifications

For Spray Coat and Fibrous Brush Coat—Apply two thorough heavy coatings using (state quantity).

For Trowel Coat—Apply one heavy coat with trowel using 1 gal. for each 12 sq. ft.

For Dampproofing Under Plaster—*Scope of the work:* Inside of all exterior walls above grade from floor slabs to bottom of floor slab above and out 6 in. on to ceilings. Carry dampproofing into all chases, all window reveals, and all radiator pockets. Connect dampproofing to spandrel turnup with extra heavy coat of material. Provide heavy cove of dampproofing at all wall angles and at sub-frames.

For Dampproofing Foundations—*Scope of work:* Outside of all exterior foundation walls from bottom of footing to grade.

Specify Under Masonry—All mortar joints on wall surfaces which have to receive dampproofing shall be solidly filled and struck.

Note: Not recommended for concrete ceilings, or conditions where weight of plaster is largely suspended from coating, or under cement plaster.

MINWAX SPANDREL WATERPROOFING

A method of building into masonry walls, over spandrel beams, lintels, etc., a tough pliable course of waterproofing which will prevent transmission of moisture with minimum reduction in the bond strength of the wall.

There are two methods of spandrel construction using Minwax materials, as follows:

Built-in-Place Spandrel

Specification—The Contractor shall apply two trowel coats of Minwax Trowel Dampproofing reinforced with one continuous layer of Minwax Cotton Cord Cloth extending from within 1 in. of wall face through the wall and to provide 3 in. for turn up.

Full-Seal Fabric Spandrel

Specification—(This method should be specified where utmost speed is required in placing.) The Contractor shall apply one layer of Minwax Full-Seal Fabric bonded to masonry and at laps with Minwax Trowel Mastic, and coated with this same material and extending from within 1 in. of wall face through the wall and to provide 3 ins. for turn up.

MINWAX TRANSPARENT WATERPROOFINGS

There are two distinct types designed to waterproof exposed masonry—brick, stucco, stone or concrete—without materially changing their color or texture. They will seal the surface but will not seal or fill visible holes or cracks, therefore on brick walls and similar surfaces the importance of proper repointing, recaulking, etc.—to provide a surface to make waterproof—cannot be overemphasized.

Minwax Clear Waterproofing

Recommended for red brick and darker colored porous surfaces. It is a light amber colored liquid which penetrates deeply—depositing a very large volume of solid mineral gums, actually filling pores and seams. These gums do, however, bring out the underlying colors of the surface in the same way as when the surface is wet with water. No work with this material should be done at temperatures below 55° F.

Minwax Colorless Waterproofing

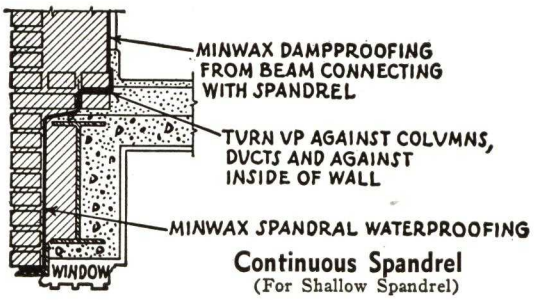
Recommended for limestone and light colored, close textured surfaces. It can be used on the lightest colored surfaces without appreciable change in their color. No work should be done with this material at temperatures below 40° F.

Specifications

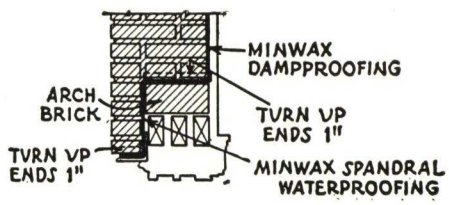
Cut out and replace with lime cement mortar all loose and unsound joints. Apply only on clean dry surfaces at temperatures mentioned above. Apply two coats, thoroughly saturate surface with each coat. After first coat, point up incidental holes and cracks with Minwax Caulking Compound, rubbing it in so that no excess remains on the surface. Waterproof from roof flashing to grade.

MINWAX BRICK AND CEMENT COATINGS

For waterproofing and decorating exposed surfaces of cast concrete, brick and stucco. A pigment coating developed from Minwax Clear Waterproofing produced in a series of flat color tones. This coating penetrates, becomes part of the concrete. May be applied with brush or spray. For further information, see File Index or Paint Section.



Continuous Spandrel
(For Shallow Spandrel)



Pan Over Window Head

MINWAX CAULKING MATERIALS

Designed for sealing joints around window or door frames to prevent the penetration of moisture or air; also for an elastic weatherproof seal for any masonry joints, particularly in extending members, such as capstones, copings, cornices, belt courses, water-tables, etc. May be applied with either a hand tool, hand gun or power gun, either on new work or old. They are unaffected by conditions of heat, cold, smoke or fumes, etc. They bond perfectly to wood, stone, steel, glass or other building materials and will remain plastic almost indefinitely.

There are two types of material:

MINWAX CAULKING COMPOUND

In three standard colors: Cream white, Limestone gray and buff; special colors extra. It is recommended for all locations where an elastic caulking of light color or one to take paint is desired. In two consistencies: No. 1 (soft) for gun application only; No. 2 (heavy) for knife, hand tool or gun application.

MINWAX ASPHALT CAULKING COMPOUND

Made in black only and is recommended for industrial work or for surfaces where dark color is satisfactory. It cannot be painted over. It is non-staining and can be used against limestone and similar surfaces. Made in one consistency, suitable for hand or gun application.

MINWAX CAULKING GUNS

We can furnish efficient powerful caulking guns which assure rapid, economical application of our materials.

Specifications

This contractor shall complete all caulking as shown on drawings or herein specified, as follows:

(Note to Architects—Check items to be included.)

Exterior Caulking—*Wood or Kalamine Doors or Windows*—Remove all exterior moulds and clean out and caulk all joints between frames and masonry.

Steel or Hollow Metal Doors or Windows—Clean out and caulk all joints between steel (or) hollow metal doors and window frames and masonry.

Sub-frames—Caulk all joints between sub-frames, and door and window frames.

Metal Spandrels—Caulk all jambs between spandrel and masonry and at joint between sill and spandrel and spandrel and window head.

Shelf Angles—Clean out and caulk all joints between masonry and underside of steel shelf angles.

Half Timbering—Clean out and caulk all joints between masonry and wood half timbering, wood lintels .....

Sills and Saddles—Wood (or) metal window sills and door sills (or) saddles shall be set in a bed of caulking compound.

Pointing Stone, Terra Cotta, etc.—All joints in stone and terra cotta on the top of copings, cornices, belt courses, washes and sills shall be raked out to a depth of ⅝ in., and filled solid with Minwax Caulking Compound, color as selected.

Glass Block—Caulk outside joints between glass and steel, wood (or) masonry at head and jambs of all glass block panels and on inside face caulk the joint at head, jambs and sills of all such panels.

Application—Pack all joints with oakum and fill solidly from the outside with Minwax Caulking Compound to a depth of not less than ¾ in. The sills shall be caulked from the inside also. The caulking shall be done before staff beads are set.

MINWAX WEATHERCAP

A Permanent Masonry Joint Protection

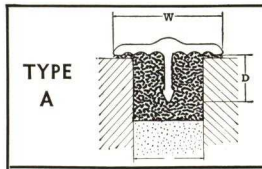
WEATHERCAP

Req. U. S. Pat. Off.

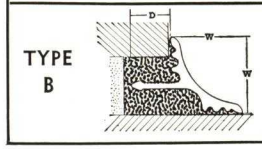
for

PERMANENT MASONRY JOINT PROTECTION

U. S. PATENT No. 2016968
CANADIAN PATENT No. 358723



TYPE A	Size	W.	D.	To Cover Joints
	2	9/16	5/16	Up to 3/8
	3	11/16	3/8	3/8 to 7/16
	4	1"	7/16	1/2 to 3/4



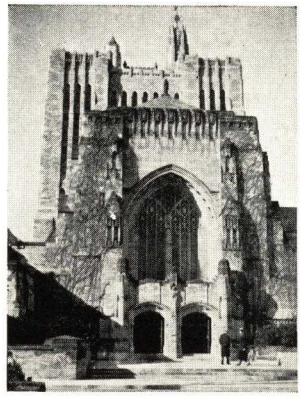
TYPE B	Size	W.	D.	To Cover Joints
	2	3/8	5/16	Up to 5/16
	3	9/16	3/8	3/8 to 1/2
	4	3/4	7/16	1/2 to 5/8

"WEATHERCAP" is a formed strip of pure soft lead, the purpose of which is to create a permanent, waterproof seal for horizontal and sloping joints in masonry, such as copings, cornices, water-tables, balustrades, steps, etc. "WEATHERCAP" is embedded in Minwax Caulking Compound. The compound provides an elastic, adhesive, waterproof filler for the joint. "WEATHERCAP" serves to seal the compound permanently in the joint, and protect the compound against deterioration from the action of sunlight and atmosphere.

As "WEATHERCAP" is pure soft lead, it is easily cut to size on the job. Its anchor can readily be notched, permitting it to be easily bent around corners. It is very malleable, and will therefore conform to the contour of rough masonry surfaces. It produces a beautiful even joint, and will not discolor or stain any surface to which it is applied. Its neutral gray color harmonizes with all building materials.

"WEATHERCAP" is furnished in two shapes (Type A and Type B) as shown above. Each type is made in three sizes, to provide for varying widths of masonry joints.

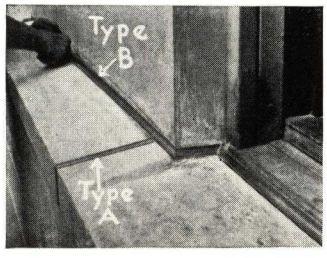
Weathercap Has Been Used in Many of America's Finest Buildings

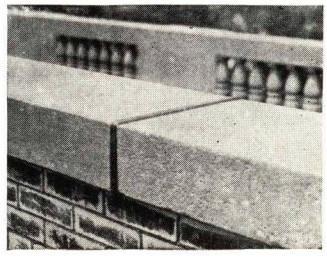


Weathercap Was Used in Sterling Memorial Library at Yale University.

Specifications

Joints are raked ⅝ in. deep, cleaned, primed with Minwax Colorless Waterproofing and caulked with an excess of Minwax Gray Caulking Compound. "WEATHERCAP", cut to size and notched for corners, is then set in the compound and pressed to a solid bed, thereby forcing the excess compound out on both sides, and filling all bonding grooves. Excess compound is then removed, leaving the masonry surface neat and clean.





Complete Data Sheets and Specifications on Request

SIKA INCORPORATED

Waterproofing Specialists and Distributors of Sika Products for the United States

TELEPHONE
Bryant 9-6200

MAIN OFFICE
330 West 42nd Street, NEW YORK, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES

SIKA PRODUCTS

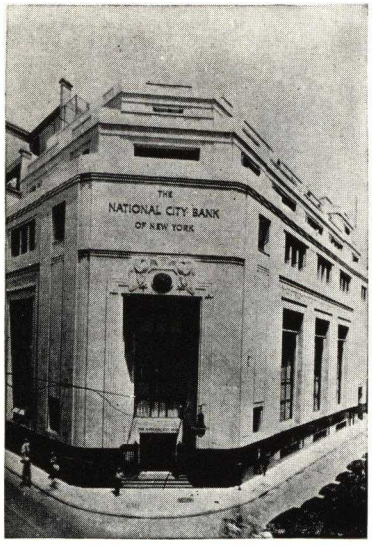
INTEGRAL WATERPROOFERS for CEMENT COATINGS; ELASTIC CAULKING for JOINTS; WATERPROOF TRANSPARENT and COLORED PAINTS; HARDENERS and PRESERVATIVES for INTERIOR and EXTERIOR SURFACES; WATERPROOFERS AGAINST PRESSURE; MATERIALS for RAPID SETTING of CONCRETE; OIL-PROOF ACID and ALKALI RESISTING MATERIALS; DAMPPROOFERS; ELASTIC WATERPROOF ROOFING MATERIAL; TILE SETTING MATERIAL; ADMIXTURE for IMPROVING CONCRETE.

"Sika Service Is World Wide"

SIKA SERVICE

We welcome inquiries on waterproofing problems, large or small, and in all cases we request that inquirers send the fullest particulars so that we may then supply the best advice and service.

General descriptive literature will be sent upon request, and instruction sheets covering various practical problems with remedial measures explained, are available for use on waterproofing jobs. Special advice and instructions are given for problems not covered by the general instruction sheet.



Branch of the National City Bank of New York
Waterproofed with Sika

SIKA INTEGRAL WATERPROOFERS

Sika Nos. 1, 2, 3, 4, and 4A are Integral Waterproofers for admixture with cement, concrete and cement plaster coatings. They are not inert porefillers but combine with the cement, effecting more complete hydration and insoluble crystallization, thus ensuring complete impermeability. They give immunity against seawater, acids in ground-water and prevent efflorescence, sweating, fungoid growths and disintegration from the effects of frost. They give added resistance to chemical solutions used in industrial processes and produce increased plasticity and adhesion. By means of the proper Sika, the setting time of ordinary portland cement can be controlled completely from a few seconds up to normal and, for this reason, Sika can be successfully used against infiltrations of water from the slightest leak up to the heaviest of streams. Sika is also used for quick setting and rapid hardening of concrete.

SIKA WATERPROOFING MATERIALS

Trade Name of Material	Purpose of Material	Miscellaneous Information
Sika No. 1 *Paste (yellow)*	*Cement Coat Waterproofing.* An integral waterproofer, used diluted, 1 part Sika to 10 parts water. Minimum proportion 3 lbs. per bag of cement. Applied to wall and floor surfaces to resist hydrostatic pressure.	Setting time is normal. One gallon in cement coat, 1 in. thick covers 80 to 120 sq. ft. Approximate weight, 9.3 lbs. per gallon.
Sika No. 2 *Liquid (red)*	*Waterproofing against heavy leakage.* Sika No. 2 added to fresh portland cement forms quick-setting mortar which is applied against heavy streams of water, stopping same instantly. Cover with Sika No. 1 Cement Mortar.	Setting time is about 10 seconds. One gallon will stop 20 to 40 leaks. Approximate weight, 10.5 lbs. per gallon.
Sika No. 3 *Liquid (green)*	*Waterproofer and for Hard-wearing Floor Finish.* Applied to floors in cement coating. *Rapid Hardening Mortar and Concrete.*	Setting time is about 30 seconds, used neat. Setting time may be controlled by dilution. Approximate weight, 10 lbs. per gal.
Sika No. 4 *Liquid (brown)*	*Waterproof Bonding Coat.* Applied as initial coat to slightly leaking surface before applying Sika No. 1 Cement Coatings. *Oil-proofing Plaster.* Oil-proofs walls and floors.	Setting time is similar to Sika No. 3. Approximate weight, 11 lbs. per gal.
Sika No. 4A *Liquid (colorless)*	*Waterproofing against moderate leakage.* Added to fresh portland cement to form quick-setting mortar which is applied directly against infiltration. Cover with Sika No. 1 Cement Mortar.	Setting time is similar to Sika No. 3. Approximate weight, 9.2 lbs. per gal.

Sika Waterproofing Materials (Continued)

Trade Name of Material	Purpose of Material	Miscellaneous Information
Conservado No. 5 *Liquid (colorless)*	*Waterproofing External Surfaces.* Colorless waterproof liquid applied to brick, stone, concrete, cement coatings, and lime plastered surfaces.	Applied by brush or spray. One gallon covers approximately 180 to 250 sq. ft. Approximate weight, 7½ lbs. per gal.
Purigo No. 3 *Liquid (colorless)*	*For Surface Hardening.* Used on old cement floors, natural and artificial stone, lime plaster.	Applied by brush. One gallon covers 180 to 250 sq. ft. Approximate weight, 9.2 lbs. per gal.
Igol No. 1 *Liquid (dark brown)*	*Dampproofing.* Brick, stone, concrete, steel, and similar surfaces usually below finished grade levels. Also used as primer in joints before applying black Igas No. 3.	Applied by brush. One gallon covers 45 to 90 sq. ft. Approximate weight, 8.7 lbs. per gal.
Igas No. 3 *Putty (black)*	*Elastic Caulking Compound.* Caulking joints where permanent elastic waterproofing qualities are essential, expansion joints, etc.	Applied with caulking tools. Quantity required depends on size of joint. Weight about 85 lbs. per cu. ft.
Igas *Putty (colored)*	*Elastic Caulking Compound.* Used similar to Igas No. 3 (black). Can be supplied in any desired shade or color to match adjacent work.	Applied with caulking tools or gun. Quantity required depends on size of joints. Weight about 80 lbs. per cu. ft.
Purigo No. 5 *Crystals*	*For Surface Hardening.* Used on new cement floors, natural and artificial stone, lime, plaster finish, etc.	Diluted with hot water and applied with a brush. One lb. covers 40 to 60 sq. ft.
Sauriermasse *Adhesive putty (black)*	*Waterproof Roof Surfacing.* Used on flat roofs. Produces hard elastic surface immediately after laying.	To be melted before applying. Weight about 65 lbs. per cu. ft.
Binda *Powder*	*For Tile Setting.* Used for setting and replacing tile and similar work where great adhesion is needed.	Mixed with water. One 100-lb. bag is sufficient to cover 150 to 200 sq. ft. of tile surface.
Plastiment	See below.	

Our engineers are available for demonstrating to those interested, the unique properties of Sika, to inspect and advise upon any work, or to estimate work to be done under our supervision and guarantee. All Sika Products are manufactured in the United States of America.

PLASTIMENT

The Vitamin of Concrete

An outstanding product—and here is what it does.

Increases—plasticity, workability, impermeability, homogeneity, adhesion, and durability. *Decreases*—working costs *Eliminates*—surplus water, air pores, water pores, and laitance.

What Plastiment is—a powder for admixture with concrete in the proportion of 1 lb. to each 99 lbs. of cement.

Its introduction allows a reduction in the total water content of a given concrete by from 10% to 20%, giving the same plasticity and workability.

Concrete so produced has its compressive strength increased 33% or more than an ordinary concrete of the same plasticity.

Plastiment leaves no surplus water in the concrete to dry out and leave pores, and the individual cement grains are more closely compacted and more completely crystallized in the form of insoluable material.

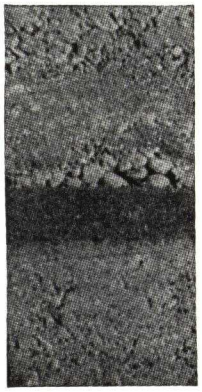
This property of Plastiment, in conjunction with the homogeneity and compactness obtained by the increase in plasticity, gives a concrete which is impermeable and, in addition, by reducing laitance at horizontal joints and increasing the adhesion between pours, eliminates all porosity at those vulnerable points.

A considerable saving of time is achieved in pouring, by virtue of the perfect workability obtained, and the cost of plastering up honeycombed faces is entirely eliminated.

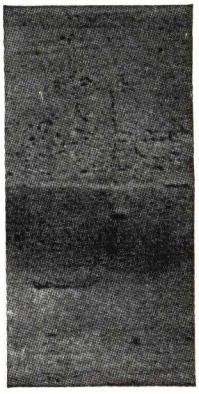
SUMMARY OF THE REPORT BY THE CIVIL ENGINEERING RESEARCH LABORATORY, COLUMBIA UNIVERSITY, OF PLASTIMENT TESTS

Series	Mix	W/C ratio gals., sack	Average slump, ins.	Average compressive strength, lbs. per sq. in.	
				7 days	28 days
A	Plain	6.2	2¼	3399	4556
B	1% "Plastiment" replacement	6.2	7⅛	3757 (+10.5%)	5381 (+18.0%)
C	1% "Plastiment" replacement	5.45 (—12%)	2¾	4514 (+32.8%)	6085 (+33.5%)

Values shown (+%) indicate comparison with Series A.
Complete report furnished on request.



Without Plastiment



With Plastiment

A most remarkable property of Plastiment is its ability to produce concrete of considerably higher homogeneity. Appearance of concrete construction work is materially improved and its smooth surfaces, free of pores and segregated parts (honeycombs), give it hermetical resistance against all mechanical and atmospheric influences.

Both concrete qualities shown above were produced with the same amount of gauging water.

An illustrated booklet giving full details of this product will be sent upon request.

Plastiment Being Added to the Concrete Mix for Road Construction, New Jersey State Highway, Jersey City, N. J.

Sika waterproofing materials have been used and are being successfully used in all parts of the globe. A list of prominent users in the United States will be furnished on request.

L. SONNEBORN SONS, INC.

Guaranteed Quality Waterproofing and Dampproofing Products

88 Lexington Avenue, NEW YORK, N. Y.

BRANCH OFFICES IN PRINCIPAL CITIES — FACTORIES, NUTLEY, N. J.

For Our Page on Floor Preservatives, Technical Paints and Varnishes, see File Index

EXTERIOR ABOVE GRADE COLORLESS WATERPROOFING FOR MASONRY SURFACES

Hydrocide Exterior Colorless Waterproofing

Description—A clear, colorless liquid composed of water-repellent colloids incorporated in special solvents which are blended in such a manner as to make the product permanently stable in form; permits the ready penetration of the water-proofer into the surface and eliminates discoloration. It differs from liquids incorporating wax, oil or gum compounds in the important fact that Hydrocide Colorless does not leave a sticky or viscous film to invite the accumulation of dust and dirt, and it remains unaffected by temperature changes.

Application—All surfaces to be waterproofed must be clean and absolutely free from moisture to insure thorough absorption. For that reason it is advisable to allow at least three days to elapse after a heavy rain before making an application. It is important that all mortar joints be inspected and wherever necessary, repointed and allowed to dry and set thoroughly before Hydrocide Colorless is applied.

Specifications—Brush or spray thoroughly on the exterior wall two (2) coats of Hydrocide Colorless (specify formula) as manufactured by L. Sonneborn Sons, Inc., 88 Lexington Avenue, New York, N. Y.

At least 18 hours should elapse between coats. For exceptionally dense surfaces, one (1) heavy saturation coat may prove sufficient. Hydrocide Colorless must be brought to the job in the original sealed containers. Can be applied by brush or spray.

Special Note: For light colored surfaces of low porosity, two coats of Hydrocide Colorless "G" are recommended; for dark colored stucco, dark colored natural stone and dark colored artificial stone and red brick, two coats of Hydrocide Colorless "B" are recommended. For surfaces of high porosity, one coat of Hydrocide Colorless "D" is recommended; in exceptional cases two coats are recommended.

Covering Capacity—For two coats, estimate 1½ gals. for each 100 sq. ft.

KAUKIT—CAULKING COMPOUND

Description—An airproof, non-shrinking waterproof, plastic caulking compound. It cures to a tough film on the surface, but remains pliable and elastic underneath. It expands and contracts with alternating temperatures.

Kaukit can be used for caulking around window frames and door jambs, glazing steel sash and skylights; sealing and waterproofing cracks and crevices in concrete, stone and brick; waterproofing flashing around chimneys, cornices and coping walls.

Kaukit is made in two consistencies: knife and gun grade. The knife grade is easily applied with a putty knife or hand tool. The gun grade is lighter in consistency and is applied with a caulking gun.

Kaukit is manufactured in Black, White, Natural, Dark Gray, Light Gray, Maroon, Green.

Covering Capacity—One gallon of gun grade is sufficient for caulking about 350 to 500 lineal feet, depending upon the depth of the joint.

One pound of Kaukit knife grade will cover about 15 to 25 lineal feet, depending upon depth of the joint.

Specifications—Caulking material shall be Kaukit as manufactured by L. Sonneborn Sons, Inc., 88 Lexington Avenue, New York, N. Y., and applied in accordance with their specifications.

INTEGRAL MULTI-PURPOSE WATERPROOFING ADMIXTURES FOR MASS CONCRETE AND MORTAR

Santorized Hydrocide Integral Paste and Powder

Description and Uses—A paste and powder containing stearates, pozzuolanic materials and agents for fusing all ingredients into a normal concrete mix, which permits efficient results, using less water (powder recommended for average waterproofing conditions; paste is recommended where substantial water pressure is to be encountered). Either paste or powder is likewise suitable in achieving reduction in the shrinkage of mortar joints.

Specifications—Integral waterproofing admixture and/or admixture for reducing shrinkage of mortar shall be Santorized Hydrocide Integral Paste [Powder], manufactured by L. Sonneborn Sons, Inc., New York, and used in accordance with their printed directions.

Santorized Trimix Integral Liquid

Description and Uses—Santorized Trimix Liquid is a solution of chemicals containing a siliceous admixture of high pozzuolanic activity for increasing the workability of mixes and when used according to the manufacturer's directions, is a suitable admixture for use as an accelerator, integral hardener and waterproofer when used in mortar or concrete construction. (If water ratio reduction and increased slump desirable, specify Santorex Integral Liquid.)

Specifications—Integral Liquid Admixture (specify either one) shall be as manufactured by L. Sonneborn Sons, Inc., New York, added to the mix and used in accordance with manufacturer's printed directions.

DAMPPROOFING AND PLASTER BOND

Hydrocide Mastic, Semi-Mastic—For Dampproofing and Waterproofing Foundations and Walls Above Grade

Description—These materials are ready for use and require no heating or mixing. They are composed of the finest asphalt reinforced with asbestos fibre and provide a modified membrane system of waterproofing.

Covering Capacity—Hydrocide Mastic, 30 to 40 lbs. for every 100 sq. ft. $\frac{1}{16}$ in. thick. Hydrocide Semi-Mastic, use 1 gal. for every 30 to 40 sq. ft. one heavy coat (two coats recommended). Hydrocide No. 648 Foundation Coating, 1 gal. for every 65 to 100 sq. ft. each coat (two coats recommended).

Specifications—Detailed specifications upon request.

Hydrocide No. 633—A Plasterbond and Dampproofer

Description—A black bituminous compound of highest quality free from coal tar or other adulterants, for application to interior surfaces of exposed exterior walls above grade.

Covering Capacity—1 gal. will cover about 65 to 100 sq. ft., one coat.

Specifications—Furnished on request.

STANDARD WATERPROOFING CORPORATION

Waterproofing and Dampproofing Engineers and Contractors
Manufacturers of Stanwaco Waterproofing Products

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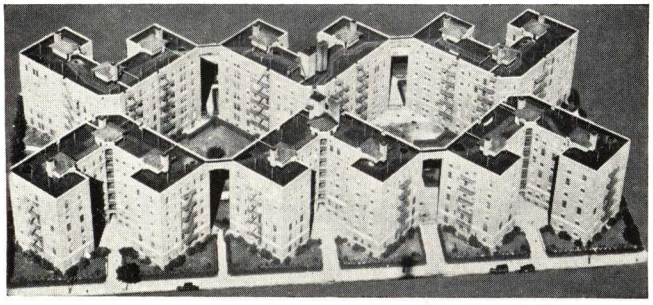
We specialize in waterproofing exterior walls above grade.

During our 35 years of waterproofing, the materials which we have perfected and the experience gained through waterproofing thousands of important buildings have enabled us to succeed even in the most difficult and unusual cases. We do not undertake any work on which we cannot give a positive guarantee against the penetration of water. The mere application of waterproofing materials on a damp or leaky wall is not sufficient. The cause must be determined to avoid continual recurrences.

Although we operate throughout the country, all applications are made by experienced mechanics trained in our service. Quotations for waterproofing work are submitted at reasonably low prices, consistent with our superior workmanship.



Open Stairs Dwellings, Jackson Heights, L. I., N. Y.
STEPHEN LENGYEL, Architect

111 John St., New York, N. Y.

"Standard Waterproofing" Is Permanent Insurance—A Written Guarantee with Every Job

A Few of the Buildings Waterproofed by "Standard" with Stanwaco Waterproofing Products

Stanwaco Installations

Louis Sherry Factory, Long Island City, N. Y.
Library, Manhattan College, New York, N. Y.
Central Illinois Ice Plants, Sringfield, Ill. (2), Macomb, Ill., Centralia, Ill. (2), Lawrenceville, Ill., Bluford, Ill.
Convent of St. Dominic, Blauvelt, N. Y.
Our Lady of Souls Chapel, Chappaqua, N. Y.
Hotel Shelton, New York, N. Y.
Hotel Westover, New York, N. Y.
Hotel Park Central, New York, N. Y.
Hotel Paris, New York, N. Y.
Hotel Gladstone, New York, N. Y.
Hotel President, Long Beach, N. Y.
521 Fifth Avenue, New York, N. Y.
Bowling Green Storage, New York, N. Y.
Knickerbocker Storage, New York, N. Y.
Arrow Storage, New York, N. Y.
Roerich Museum, New York, N. Y.
300 West 23rd Street, New York, N. Y.
Our Lady of Esperaza Church, New York, N. Y.
Holy Family Church, Bronx, N. Y.
St. John Chrysostom Church, Bronx, N. Y.
Woodside National Bank, Woodside, Long Island, N. Y.
Board of Transportation, New York, N. Y.
(1) 207th Street Yards, (2) Jamaica Yards
Rendell Memorial Church, New York, N. Y.
Emanuel A. R. E. Church, New York, N. Y.
Harborside Warehouse, Jersey City, N. J.
Sherry Netherland Hotel, New York, N. Y.
120 Wall Street, New York, N. Y.
Eighteen Public Schools, New York, N. Y.
East and West End Schools, City of Long Beach, N. Y.
U. S. Government Army Barracks, Fort Slocum, N. Y.
Queens County Savings Bank, Corona, Long Island, N .Y.
Ritz Carlton Hotel, Atlantic City, N. J.
Brooklyn State Hospital, Creedmore, Long Island, N. Y.
Church of Our Lady of Mount Carmel, Mount Vernon, N. Y.
New York Office Furniture Building, New York, N. Y.
Pocono Manor, Pocono, Pa.
Industrial Office Building, Newark, N. J.
111 John Street, New York, N. Y.
99 Wall Street, New York, N. Y.
Chester Lane Apartments, Port Chester, N. Y.
Springdale School, Springdale, Conn.
Franklin School, Stamford, Conn.
Stamford High School, Stamford, Conn.
Washington School, Union, N. J.
12 Bay Shore Avenue, Bay Shore, Long Island, N. Y.
Centre Garden Apartments, New Rochelle, N. Y.
Israel Orphan Asylum, New York, N. Y.
Brooklyn Hebrew Home and Hospital, Brooklyn, N. Y.
Ossining High School, Ossining, N. Y.
Mamaroneck High School, Mamaroneck, N. Y.
Y. W. H. A., 110th Street Branch, New York, N. Y.
Cutchogue School, Cutchogue, Long Island, N. Y.
Psychiatric Hospital, New York, N. Y.
Munson Line Building, New York, N. Y.
Brooklyn Trust Company, Neptune Br., Brooklyn, N. Y.
Montague Br., Brooklyn, N. Y.
St. Francis Xavier School, New York, N. Y.
Open Stairs Dwelling, Jackson Heights, Long Island, N. Y.

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CENTRAL WAREHOUSE: Lysle Boulevard, McKeesport, Pa. (Telephone: McKeesport 2-6273)

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THREE INGREDIENTS COMPRISE THE THORO SYSTEM

Thoro-seal
TRADE-MARK

Quick-seal
TRADE-MARK

Water plug
TRADE-MARK

Thoroseal, Quickseal and Waterplug comprise "The Thoro System" of waterproofing and protection of masonry structures.

Thoroseal, Quickseal and Waterplug are dry cementitious compounds to which clean water is added to make them ready for use. The materials are balanced and guaranteed to do the work for which they are specified.

They are as permanent as the structure to which they are applied and become more impervious to water when subjected to extreme pressure and in constant contact with water.

Waterplug is fast setting; expansion and set begins three minutes after water is added and maximum expansion is reached five minutes after water is added. It is non-shrink and completely fills a hole, crack or crevice in which it has been applied. Waterplug becomes 100% waterproof thirty minutes after the addition of clean mixing water.

Active water and seepage through masonry structures may be stopped instantly and permanently with Waterplug.

Thoroseal (trowel coat), and Quickseal (brush coats), develop waterproof film after application, and, if kept damp or applied in a damp room, become very glasseous in appearance.

Consulting Service

We are in a position to offer experienced consulting service in the application of masonry wall coatings. Architects and engineers are invited to submit their problems to our engineering department—this does not entail any obligation.

Delivery

Twenty-four hour delivery by railway express, motor express, parcel post, B. & O., Pennsylvania and New York Central railroads to all points on Atlantic Coast, Great Lakes, West to Chicago and South to Washington. Our representatives can also make shipments on short notice in their vicinity.

THE FOLLOWING STANDARD SPECIFICATIONS WITH STANDARD DRAWINGS ARE AVAILABLE TO ARCHITECTS AND ENGINEERS UPON WRITTEN REQUEST TO THE HOME OFFICE OR ANY OF OUR REPRESENTATIVES

SP- 7 Foundations, home and commercial buildings, light construction, concrete block or tile, maximum depth ten (10′) feet below grade.

SP-14 Foundations, school, office, factory buildings, maximum depth twenty (20′) feet below grade.

SP-15 Pits, sumps and masonry extending below established sewers and drains.

SP-16 Waterproofing inside surfaces of outside building walls. (Care of gypsum plaster.)

SP-17 Protection of parapet walls, coping, beltcourses and other masonry exposed to extreme weather conditions.

SP-18 Monolithic floors or other flat slabs of concrete in contact with earth below grade. Smooth waterproof finish for light traffic.

SP-21 Protection and preservation of reinforced concrete masonry above grade.

SP-22 Reconditioning of reinforced concrete masonry above grade, blistered concrete, due to oxidizing of reinforcing rods.

SP-28 Exterior surface protection, waterproofing and beautifying of service stations, garages and light manufacturing plants of concrete block, tile and other masonry.

TWENTY-FOUR YEARS CONTINUOUS SUCCESS CORRECTING AND PREVENTING MASONRY PROBLEMS

THE Thoro SYSTEM

PROTECTS THE EARTH'S MASONRY

Method A—Waterplug raggle and sanitary cove sealing shrinkage crack at angle between floor and wall, ⅓ lb. to each lineal foot for 1-in. radius cove.

Method A-1—Sanitary cove of Waterplug without raggle at angle between floor and wall, ⅓ lb. per lineal foot for 1-in. radius cove.

Method A-2—Waterplug raggle ½ x ¾ in. deep at angle between floor and wall, ⅓ lb. per lineal foot.

Method B — Inside application of Thoroseal applied against pressure, one brush coat and one trowel coat, 16 lbs. per sq. yd.

Method B-1—Inside application for moisture and dampness, two brush coats Quickseal, 3 lbs. per sq. yd.

Method B-2—Irregular surfaces. Scratch coat to level up before application of Thoroseal Finish. Mix 10 lbs. Thoroseal Integral Waterproofing and 1 bag cement until uniform in color, add 1½ lbs. 150 lbs clean sand, mix all ingredients dry and uniform before adding clean water. 20 lbs. dry weight per sq. yd. will be required for each ¼-in. of scratch coat. Let set 12 hours and apply 5 lbs. Thoroseal to square yard for seal and finish coat.

Method C—Outside application of Thoroseal, one brush coat and one trowel coat, 10 lbs. per sq. yd.

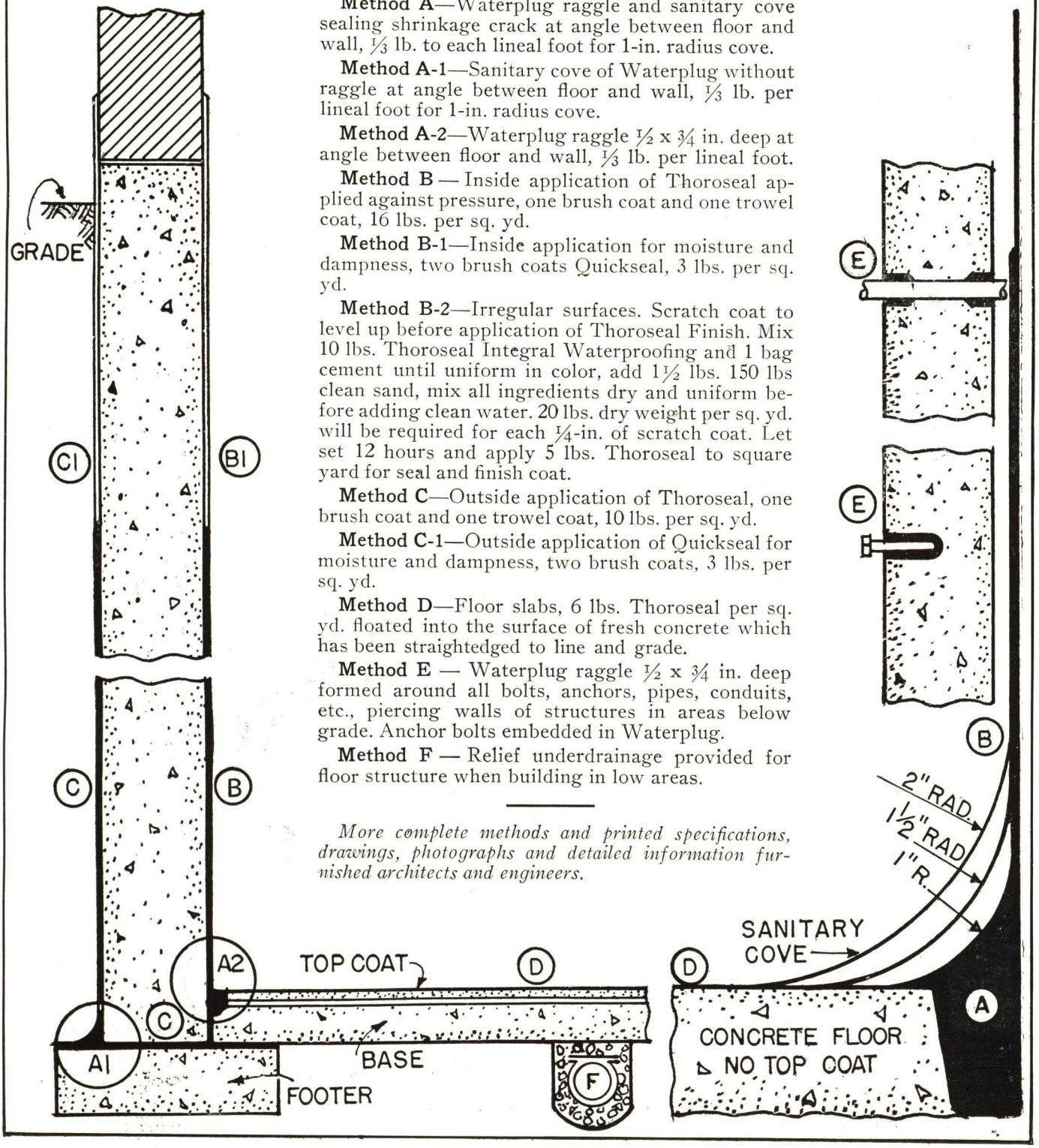
Method C-1—Outside application of Quickseal for moisture and dampness, two brush coats, 3 lbs. per sq. yd.

Method D—Floor slabs, 6 lbs. Thoroseal per sq. yd. floated into the surface of fresh concrete which has been straightedged to line and grade.

Method E — Waterplug raggle ½ x ¾ in. deep formed around all bolts, anchors, pipes, conduits, etc., piercing walls of structures in areas below grade. Anchor bolts embedded in Waterplug.

Method F — Relief underdrainage provided for floor structure when building in low areas.

More complete methods and printed specifications, drawings, photographs and detailed information furnished architects and engineers.



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For all Masonry below grade

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With Asphaltic Compounds for exterior columns and beams

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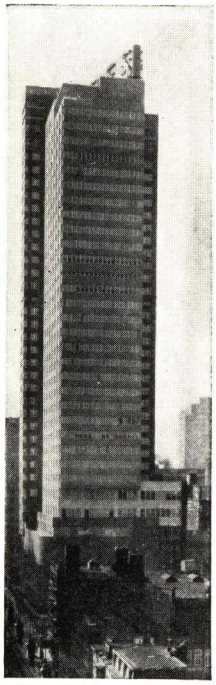
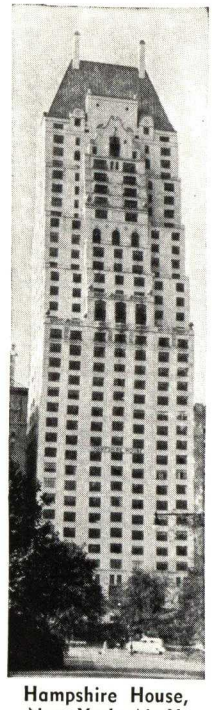
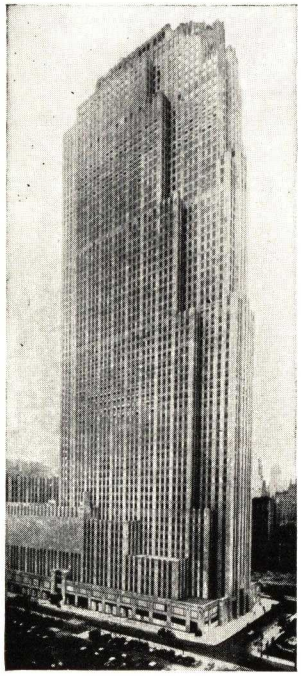


Philadelphia Savings Fund Building
Philadelphia, Pa.
HOWE & LESCAZE, Architects

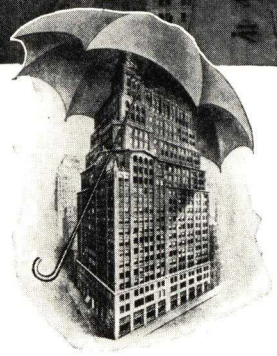


Hampshire House, New York, N. Y.
A. ROLLIN CAUGHEY, Architect

New York Central Building, New York, N. Y.
WARREN & WETMORE, Architects



RCA Bldg., Rockefeller Center
New York, N. Y.
HOOD & FOULIHOUX, HARRISON & MCMURRAY & CORBETT, REINHARD & HOFMEISTER, Architects



"When it rains, we reign."
Trade Mark

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Western Union Bldg., New York
Williamsburg Housing, New York
Associated Press Bldg., New York
David Milton Residence, Pocantico Hills, N. Y.
Bonwit Teller Store, New York
Eastern Maine Hospital, Bangor, Me.
Museum of Modern Art, New York

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American Radiator Bldg., New York, N. Y.
RAYMOND HOOD, Architect

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INSULATING and SMOKESTACK PAINTS; ACID and ALKALI RESISTING PAINTS, ROOFING PAINT; ENAMELS; STONE BACKING; WOOD FLOOR PRESERVATIVES, MORTAR CEMENT and PLASTER COLORS; DECORATIVE PAINTS for all purposes.

Purpose or Service	Product	Descriptive Data
Damp-proofings — Plasterbonds: Interior Wall Surfaces Super Structure	"R.I.W." No. 232	A black elastic full bodied, tacky damp-proofing and plasterbond coating for brush or spray application to interior surfaces of masonry walls to which hard plaster is to be applied. Prevents penetration of dampness and renders plastered walls stainproof. Not recommended for use under portland cement mortar (except under special instructions).
	"R.I.W." Semi Mastic	Similar to No. 232, except a heavier bodied material.
	"R.I.W." Plastertox	Mastic damp-proofing and plaster bond for trowel application. Similar in properties to No. 232.
Waterproofing: Foundation Walls — Floors Tunnels — Bridge Floors, etc. Membrane and Brush Coat Methods	"R.I.W." Marine Cement	A black heavy body damp-proof coating for cold brush application to exterior of foundation walls and footings, concrete base floor slabs, wood sleepers or timber laid in concrete or set inground.
	"R.I.W." Self-Healing Bridge Cement	A black elastic viscous non-hardening membrane compound; unaffected by vibration, low or high temperatures. Applied hot with mop or roofing brush.
Integral and Plaster Coat Methods	"R.I.W." Toxement Powder and Liquid	R.I.W. Toxement Compounds give increased workability, flowability with lower water-cement ratio and promote complete and proper hydration of the cement. Toxement compounds minimize efflorescence and shrinkage.
	"R.I.W." Mortar Toxement For brick and stone mortar	Integral waterproofing for all portland cement (concrete-stucco) construction and cement products. 1½ to 2 lbs. Toxement Powder required per bag of cement; 1 qt. Toxement liquid per bag of cement.
	"R.I.W." Concentrated Toxement Paste	A highly concentrated stearate paste integral waterproofing, which readily intermixes, gives increased workability, etc., along with thorough and efficient waterproofing. 6/10 lbs. required per bag of cement.
	"R.I.W." Tox-Mix Liquid	A semi-liquid for integrally hardening and waterproofing concrete-cement floor finishes etc. Speeds up setting action with a permanent increase in compressive and tensile strengths. 1 qt. per bag of cement.
	"R.I.W." Ironized Waterproofing Plaster coat method	Metallic waterproofing system. A specially processed iron compound which when applied in two or three successive brush coats and cement plaster coat renders walls or floors resistant to water pressure.
Plasticizers and Non-shrink Admixtures	"R.I.W." Tox-Co-Mix No. 2	Puzzolanic Plasticizer and Non-shrink Admixture for portland cement or lime mixtures.
Stain-proofing and Damp-proofing: Stone and Wood Trim, etc.	"R.I.W." No. 110	A black alkali-acid resisting and waterproof elastic paint for protection of limestone marble and other stone from chemical action and discoloration due to alkalis in cement and moisture. Also used to back paint wood trim, etc., in contact with masonry.
Damp-proofing; Exterior: Above Grade Colorless — Transparent-Color	"R.I.W." Toxloxpore	A colorless damp-proofing for application to brick, concrete, stucco, limestone, etc. Thoroughly damp-proofs and prevents developments of efflorescence.
	"R.I.W." Anhydrosol	Transparent damp-proofing similar in properties to Toxloxpore, but heavier bodied.
	"R.I.W." Liquid Konkerit	A waterproof masonry paint in white and colors. For application to stucco, brick and other masonry. Dries with a flat finish, for gloss apply R.I.W. Flex-Sicco Paint.
Pointing and Caulking:	"R.I.W." Elastic Pointing and Caulking Compound	Gray and caenstone shades. Gun and knifing consistencies. An elastic waterproof non-staining compound. For pointing of terra cotta and stone joints etc. and caulking metal or wood windows, doors, etc.
Cement and Wood Floors: Decorative Coatings	"R.I.W." Cement Floor Enamel	A decorative protective floor coating in white and other shades for dry cement or wood floor. This waterproof enamel penetrating the pores, neutralizes lime inherent in cement, hardens the surface; is oil resisting, prevents cement dusting.
Wood Floor Preservative	"R.I.W." Toxbro Preservative Filler	A light straw color composition for application to wood floors or other wood surfaces. Binds wood fibres together, prevents grain of wood from raising. Fills and insures a smooth surface. Prevents silvering, splintering, cracking and checking.
Hardening-Dustproofing	"R.I.W." Cement Filler	A transparent cement floor coating which hardens, dustproofs. Renders floor resistant to water and oil.
	"R.I.W." Flintox	A chemical treatment furnished in crystal and liquid form for surface application to harden and dustproof. Two coatings recommended.
Integral Hardening and Coloring	"R.I.W." Toxmix Colored	An integral paste medium in various shades. An alkaliproof coloring-hardening medium which readily intermixes and possesses great waterproofing properties.
Metallic Floor Hardeners (Dust-on Method)	"R.I.W." Puzzolanic Metallic Hardener	A specially processed and graded metallic hardener. Readily mixes and trowels with cement. Resists abrasion and destructive influences. Furnished in gray and red—other colors can be supplied. Use 30 lbs. per 100 sq. ft.
	"R.I.W." Non-Slip Metallic Hardener	For use in cement or asphalt floors to give safe traction. Gives permanent non-slip metallic surface even under wet conditions. Natural and red shades. For cement floors use 30 lbs. per 100 sq. ft.
Steel and Metal Preservative Paints-Priming and Shop Coats	"R.I.W." Tockolith	A cement basic, anti-corrosive paint. Gray color. For priming iron, steel, metal, etc. Always apply a finishing coat according to desired color and service conditions.
	"R.I.W." No. 708	For priming or finish coat, a gray flexible acid-alkali resisting waterproof paint for steel or wood interior or exterior exposure. Resistant to sulphur fumes, ammonia, gases and electrolytic corrosion.
Finish Coats Interior or Exterior	"R.I.W." No. 1017	Furnished in black, gray, red, brown, dark green, etc. An acid and alkali-resisting waterproof paint for application to steel or wood, tanks, gas holders, bridges, and in chemical plants.
	"R.I.W." No. 49	A high grade exterior waterproof paint made in black, maroon, olive green. Withstands action of gases, acid fumes and high heat.
Machinery and Pipes	"R.I.W." Machinery and Pipe Enamel	Furnished in various colors. Particularly adapted for use on machinery, transformers, engines, pipes, guard rails, etc.
Enamels and Wall Coatings	"R.I.W." Plaster Primer	A semi-opaque liquid plaster wall primer. It overcomes alkalinity in plaster and gives exceptional base for succeeding coats of flat wall paint or enamels.
	"R.I.W." Hospital and Laboratory Enamel	A waterproof white hard usage enamel. Resistant to acid fumes, gases, etc. Retains its whiteness. Ideal for hospitals, laboratories, kitchens, bathrooms, etc.

Specification Data Sheets and Color Cards Forwarded on Request

Specialties and Service Department

Our Technical Service Department can be of assistance to our clients where special materials are required or where unusual conditions are to be contended with.

Correspondence and personal inquiry are invited on technical paint and damp-proofing and waterproofing problems.

THE TREMCO MANUFACTURING CO.

Caulking, Pointing, Glazing Mastics; Mastic Flooring; Waterproofings and Paints

393 East 131st Street
CLEVELAND, OHIO

REPRESENTATIVES IN THE PRINCIPAL CITIES

CANADA: The Tremco Manufacturing Co. (Canada), Limited, LEASIDE, ONTARIO

TREMCO TESTED CAULKING AND POINTING COMPOUND

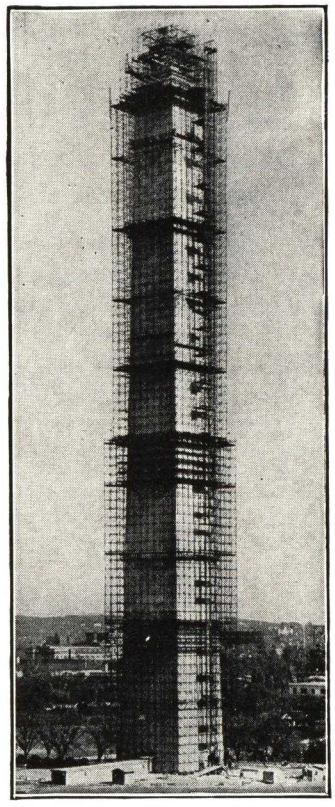
Adhesiveness, lasting "life," non-staining qualities and freedom from sagging or running in hot weather are among the merits which have won preference for Tremco Caulking and Pointing Compound, where conditions are most exacting. Constantly checked in its production by authentic Bureau of Standards Tests, it may be specified with confidence that every desirable service condition will be fulfilled. Made in seven standard colors. Others on order.

A new 12-page illustrated text, with complete specifications for caulking and pointing in a great variety of purposes and applications will be mailed on request.

TREMGLAZE, ECONOMICAL, SAFE GLAZING MASTIC

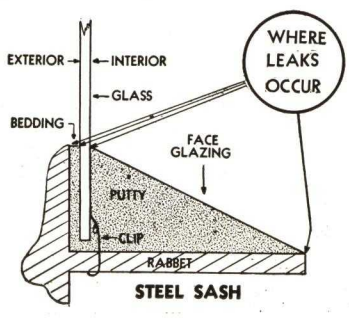
This development of Tremco Laboratories has brought the recognized advantages of mastic glazing to those operations where the higher application cost of mastics has always been a barrier. Tremglaze is applied as rapidly, easily and economically as putty. Its slightly higher material cost is offset by the advantage of perfect adhesion under all conditions of moisture, cold and heat so that the sash is kept leakproof regardless of conditions at the time of application and afterwards.

TREMCO



Washington Monument
Plastic Pointing with Tremco

Adhesion Important With Metal Sash



Choice of a glazing material must be made with a view to whatever possible conditions may prevail when the job is done. Variations of temperature and humidity at the time of glazing have been found to affect adhesion. Failure is not easy to detect, since the material appears to be intact and functioning until storms reveal leakage. The sketch shows where leaks occur, due to faulty adhesion. Results include corrosion of sash, as well as peril to building's contents. Unfailing adhesion was the first principle observed in the development of Tremglaze.

Protecting Sash From Fumes

In industrial buildings, where anticipated process entail acid-laden vapor, or other corrosive fumes, it is important that the sash be protected and the glazing material, itself, be such as not to impair metal. No better safeguard can be provided than Tremglaze. Firms which have satisfied themselves on this score include the Youngstown Sheet and Tube Co., The Diamond Alkali Co., The Willard Storage Battery Co., The Industrial Rayon Co., and the American Viscose Co.

Low Cost Sash Protection

For an additional cost of approximately 3¾ cents per light of 14 by 20-in. glass, it is possible to adopt measures which protect steel sash from rust, greatly reduce glass breakage, safeguard the metal against fumes and acids, save the cost of wire glass, or galvanized sash and keep the sash weather-tight for a gratifying period of years. The additional cost indicated represents about 10% of the total cost of a glazing operation. Its recovery is certain—perhaps immediately in the avoidance of leakage, perhaps not until re-glazing becomes an issue, due to inevitable breakage. When this necessity arises, Tremglaze is readily stripped away without excessive labor or damage to the sash.

SERVICE

Experienced Tremco Field Men throughout the country are prepared to give detailed information on problems of caulking, glazing, pointing, waterproofing, flooring and painting.

THE TRUSCON LABORATORIES

Waterproofings—Floor Hardeners

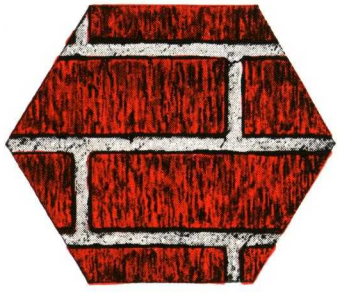
FACTORY AND HOME OFFICE

DETROIT, MICH.

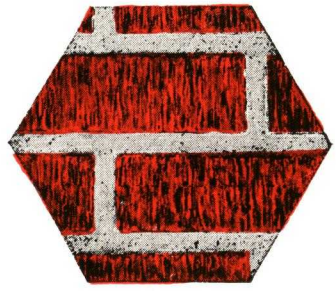
BRANCHES AND WAREHOUSES IN PRINCIPAL CITIES

SHRINK-PROOF MORTAR WITH LESS WATER

Ordinary Mortar
This shrinkage occurs with mortars which contain the excess water necessary to produce workability.



Trade Mark Registered



Mortite Mortar
This non-shrinking mortar is obtained by reducing the water content in mortar when Mortite is used.

DRY MIX MADE WORKABLE WITH TRUSCON MORTITE

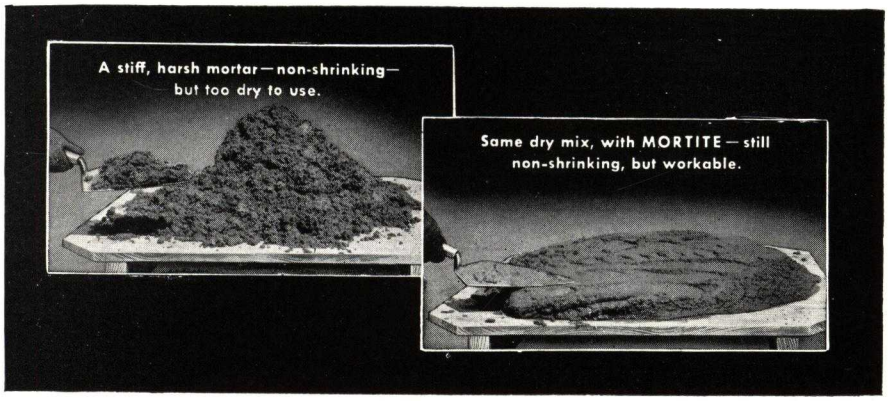
Water reduction in cement and lime mortars is a highly desirable objective. With less water, there is less evaporation, and mortar shrinkage is reduced below the critical point.

TRUSCON **MORTITE** produces a watertight mortar joint. It is pozzuolanic in its action —adsorbing the free lime in mortars, rendering same insoluble to the leaching out process of rain and weathering, which so frequently causes efflorescence on brick walls.

With Truscon Mortite added to mix, a perfectly workable mortar is obtained, with much less water. Independent testing laboratories report as much as 130% greater slump with Mortite. A mortar mixed as dry as shown in photograph (left, below) became perfectly workable when Mortite was used (photo, right below).

Mortite contains stearate, which repels moisture and

By transforming the lime into an insoluble compound, Mortite protects the mortar from corrosion and crumbling caused by the chemical action of sulphur compounds and gases in industrial districts. It is the great mortar "conditioner"—makes mortar denser, stronger, waterproof, and non-shrinking.



ADVANTAGES

1. Large water reduction—with perfect workability.
2. Eliminates shrinkage, crazing and hair checks in mortar joints.
3. Better wetting, hence, better mortar contact with brick.
4. Increased mortar strength. Fewer voids, stronger bond.
5. Water-repellent mortar.
6. Renders lime insoluble.
7. Greatly reduces, or eliminates, efflorescence.
8. Resists corrosion from smoke and gases.

THE TRUSCON LABORATORIES

TRUSCON Specification Chart

WATERPROOFINGS and DAMPPROOFING

Requirement	Specify	Description
WATERPROOFING MASS CONCRETE Foundations— Tanks— Tunnels—etc.	TRUSCON Zilicon Waterproofing Paste	Improved repellent stearate waterproofing. Combines water-reduction in mix with high degree of water-repellency of set concrete. Improves workability even with less water; denser mix and stronger concrete. Added directly to mix. Contains no calcium chloride or soluble salts. Adsorbs the lime and protects concrete from corrosion where exposed to sulphur liquors, or similarly destructive chemicals. The ultimate in integral waterproofness, along with improved workability, increased strength and weather-resistance in concrete and Portland cement stucco. Specify: Waterproof Cement Stucco (1:3)—8 lbs. per 100 sq. ft., 1". For Concrete: 7 lbs. per cu. yd.
Non-Shrinking, BRICK MORTAR Waterproof Non-Efflorescing	TRUSCON Mortite	Less water—makes better mortar. Increases strength and reduces shrinkage below critical point because of lower volume loss due to lower water evaporation. Adds corrosion resistance to mortars and minimizes lime stains or "efflorescence" on brick surface. Specify one quart Mortite per sack Portland cement—and 1 quart Mortite per cu. ft. lime putty.
SHRINKPROOF CEMENT GROUT— for Floor Repairs— for Bedding Machinery	TRUSCON Iso-Vol	Added to cement grout, mortar or concrete to produce a non-shrinking cement mix. Invaluable for filling holes, worn spots, or cracks in floors—for repointing masonry—for grouting bolts—bedding machinery, or under columns.
IRON METHOD OF Waterproofing	TRUSCON Ferritex	Finely pulverized iron compound, processed and treated for Ironite Method of waterproofing. Ready for use—mixed with water and applied as several brush coats over concrete, sealing pores. Dries to a deep brown color, which may be coated over with cement wash, or StuccoTex. Approx. quantity—10 lbs. per 100 sq. ft.
SPANDREL DAMPPROOFING	TRUSCON Spandrel Dampproofing	A liquid black dampproofing, applied cold, for exterior spandrel beams previous to facing with brick or stone. Application by brush or spray. Approx. quantity—80 to 100 sq. ft. per gallon, 1 coat.
TRANSPARENT DAMPPROOFING Non-Staining	TRUSCON Super-Por-Seal	An improved repellent, invisible dampproofing for exterior stone, brick, concrete and stucco (not for vitrified brick). Super-Por-Seal is formulated on a stearate base similar to Truscon Waterproofing Paste. Very clear, and may be used with very little (if any) discoloration even on Bedford Stone and marble. Not affected by temperatures—but must be applied to dry, frost-free surface. Application by brush or spray. Quantity: about 150 sq. ft. per gal., 1 coat; 80 sq. ft. per gal., 2 coats.
SURFACE WATERPROOFING— for Exterior Concrete or Masonry	TRUSCON Por-Lox	Applied hot and scrubbed in to warm surface. Colorless, but will darken surface to some extent, or intensify color. Especially recommended for very porous and hair checked stucco, or for very porous brick. Approx. quantity: 80 to 100 sq. ft. per gal.
BRICK AND CEMENT COATING (COLORS) —Concrete, Stucco and Masonry	TRUSCON StoneTex	Not to be confused with ordinary paints, such as house paint—but the original waterproof, China Wood Oil (Tung Oil) coating for weather protecting, beautifying and uniforming the color of exterior concrete, brick and stone. Produces a matte finish and looks like stone. Ten appropriate concrete and masonry colors, including Pure White. Apply by brush or spray. Approx. quantity: 100 sq. ft. per gal.
Waterproof Plastic for CRACKED STUCCO —also Sills and Horizontal Surfaces	TRUSCON StoneTex Plastic	Similar to StoneTex, except produced in heavy plastic form and applied to a thickness of about $\frac{1}{16}$", with trowel, stub bristle brush, or special power spray. Surface dries to tough skin, remaining elastic underneath. Provides a self-healing film, especially adaptable to badly cracked stucco, or for use on horizontal surfaces such as sills or tops of copings where the added thickness of StoneTex Plastic film improves weather resistance. Approx. quantity: 40 to 50 sq. ft. to gal., applied $\frac{1}{16}$" thick.

TRUSCON Specification Chart

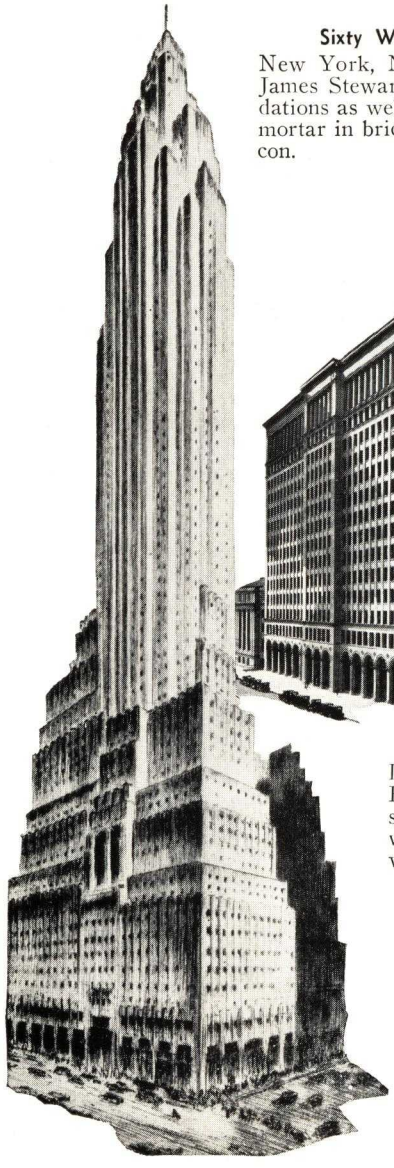
FLOOR TREATMENTS

Requirement	Specify	Description
Chemically HARDENING Soft, Granulating Concrete Floors	TRUSCON Agatex Liquid or Agatex Crystals	Chemical in liquid or dry form (specify Agatex Liquid or Agatex Crystals, as desired). Mixed with water and applied directly to dusting or sanding concrete floors. Not a paint; hardens chemically. Renders lime insoluble—therefore, especially beneficial for concrete floors where exposed to mild acid conditions, as in pickling, preserving, or canning establishments. Applied with brush or broom. Approx. quantity: Agatex Liquid—100 sq. ft. per gal., 3 coat application. Agatex Crystals—50 sq. ft. per lb., 2 coat application.
DUSTPROOFING and Hardening Cement Floors	TRUSCON Penetex	A highly penetrative oil-type coating for reconditioning floors, especially concrete or porous tile. Liquid clear, but darkens surface. Puts new life into colored concrete or unglazed tile floors. Preserves flagstone, natural stone, or composition floors. Oilproof, stainproof, and easily washable. Applied by brush or squeegee. Approx. quantity: 225 sq. ft. per gal., 1 coat; 150 sq. ft. per gal., 2 coats.
Metallic FLOOR HARDENER	TRUSCON Floor Hardener	A compound of hard, ground iron carefully graded in size from coarse to fine, to conform to curve of maximum density. Hard granular structure. Especially treated—free from oil, graphite, and injurious impurities such as aluminum. Mixed with cement and dusted over finished floor previous to final trowelling. Six colors, and Natural. Approx. quantity per 100 sq. ft.: For light duty floors—30 to 40 lbs. For heavy duty floors—120 lbs.
Metallic FLOOR HARDENER (Improved Type)	TRUSCON Ferricon	Similar to Standard Floor Hardener (above), but much improved by addition of special admixture "Zilicon", which adds these advantages: (1) improved workability; (2) densification; (3) increased strength; (4) protection against weak organic acids; (5) freedom from lime streaks. Application and quantity required—same as Truscon Floor Hardener.
Non-Slip FLOOR HARDENER Non-Rusting	TRUSCON Hurundum	A non-metallic hardener—contains Hurundum aggregate. Hurundum is a product of the electric furnace—so hard it cuts glass—at the same time, of porous structure, enabling cement paste to "key" into it very firmly. Floors are non-rusting and non-corrosive, and where subject to wetting, non-slipping. Colors, application, and quantity required—similar to Metallic Floor Hardener (above).
INTEGRAL COLOR and Hardener —Concrete Floors	TRUSCON Art-Roc with Color	For hardening and coloring light duty cement floor topping integrally. Contains no calcium chloride. Six standard floor colors. Stainproof—waterproof. Possesses low water-cement ratio, insuring increased strength with increased hardness. Adsorbs lime and increases resistance to disintegration from mild organic acids. Art-Roc added directly to concrete mix. Carries color integrally throughout floor topping. To deepen color and improve appearance, wax and polish with Art-Roc Wax (transparent and colors same as Art-Roc). Quantity required: 1 gal. Art-Roc color per sack of cement.
HARDENING and Waterproofing— LIGHT DUTY Concrete Floors	TRUSCON Art-Roc Colorless	Same as Art-Roc except no color. Contains no calcium chloride. For hardening floor topping in light industrial buildings, schools, offices. Added directly to cement mix. Quantity required: 1 quart per sack of cement.
ENAMEL for Concrete Floors	TRUSCON Floor Enamel	Originally made especially for cement, but since found to give equally good results on wood floors. High gloss, tough-surface enamel. Non-oil absorptive and protects floor from staining and discoloration. Applied by brush. Ten attractive colors. Approx. quantity: 175 sq. ft. per gal., 2 coats.
Rubber-Base Floor Enamel —ALKALIPROOF	TRUSCON Alchemik Concrete Floor Coating	Differs from standard Truscon Floor Enamel in that Alchemik is formulated on a rubber base instead of oleoresinous base. It is alkali- and moisture-resistant and, therefore, better adapted for basement or interior grade concrete floors. Floor must be dry. Do not use over oil base paint. Non-saponifiable. Ten attractive colors—also White, Black and Clear. Approx. quantity: 200 to 225 sq. ft. per gal., 2 coats.
COLOR STAIN AND FINISH for Concrete Floors —Waterproof Limeproof	TRUSCON Flor-Dye System	Flor-Dye System consists of two materials: (1) Flor-Dye, a penetrant for coloring, sealing and hardening cement floors or porous tile floors. (2) Flor-Dye Dressing, the finish, for emphasizing the color and protecting the treatment. The system is new and far superior to surface coatings inasmuch as the Flor-Dye color penetrates deep into the cement finish, making the color permanent. Waterproof and therefore adaptable to basement grade floors or outside cement terraces. Four attractive colors. Approximate quantity: Flor-Dye—300 sq. ft. to the gal. Flor-Dye Dressing—500 sq. ft. to the gal., 1 application.

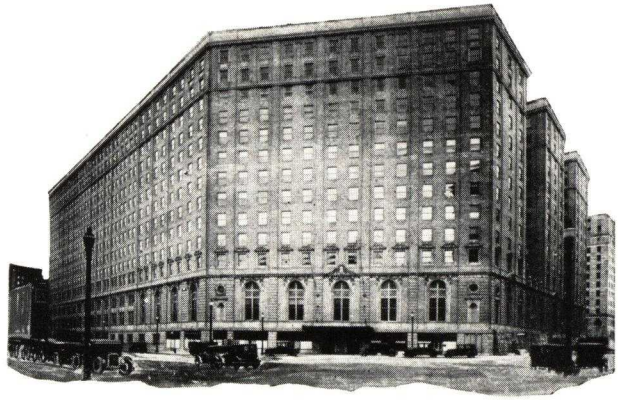
TRUSCON Specification Chart

MISCELLANEOUS

Requirement	Specify	Description
CAULKING	**TRUSCON Caulking Compound**	A natural gray, non-staining caulking, for use around window or door frames, mortar joints, cracks. Elastic and self-adjusting to movement of surface. Two consistencies—knife and gun. (Also Government type). When pointing mortar joints, seal surface of joint with Super-Por-Seal before caulking.
GLAZING Steel or Wood Sash (Reduces Breakage)	**TRUSCON Glazing Mastic (Fibrated)**	The modern glazing compound for steel or wood sash. Also for re-glazing. Two consistencies—gun and knife. Surface dries, leaving interior of compound soft, to permit movement of glass and sash without breaking. Very adhesive. Maintains watertight, airproof bond. If glass must be taken out, Mastic can easily be removed with putty knife and re-glazing done without trouble. Approx. quantity: 1 lb. for each 6 ft. of glass perimeter.
FILTRATION and Water Works DAMPPROOFING	**TRUSCON Filtration Plant Coating**	A moisture-resisting coating for coating outside of concrete foundation or retaining walls of water works, exposed, or under earth filling. Applied cold (no heating) in two coats. (Primer and Finish). Color: Black, Approx. quantity: Primer, 80-100 sq. ft. Finish: 100-150 sq. ft. per gallon.



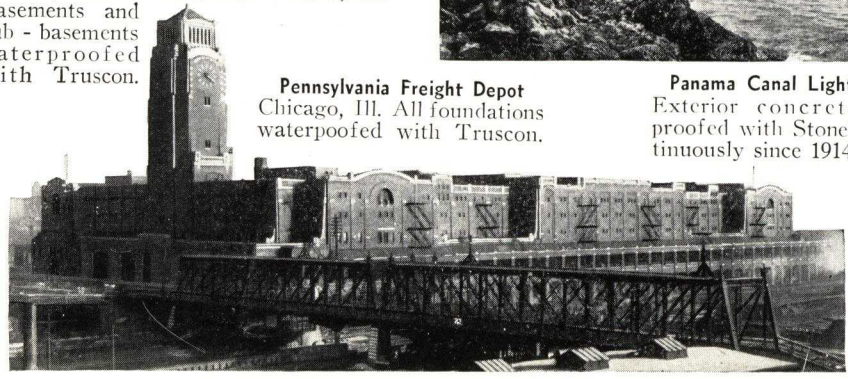
Sixty Wall Tower
New York, N. Y. Contrs.: James Stewart & Co. Foundations as well as all cement mortar in brick work, Truscon.



Statler Hotels
Boston, Detroit, and St. Louis. Integrally waterproofed with Truscon.

General Motors Building
Detroit, Mich. Archt.: Albert Kahn, Inc. Basements and sub-basements waterproofed with Truscon.

Pennsylvania Freight Depot
Chicago, Ill. All foundations waterpoofed with Truscon.



Panama Canal Light Houses
Exterior concrete dampproofed with StoneTex continuously since 1914.

THE VORTEX MANUFACTURING CO.

Gun Applied Dampproofing and Plaster Key

1978 West 77th Street, CLEVELAND, OHIO

APPLIED BY PAR-LOCK APPLIERS IN

ALBANY, N. Y.	CHICAGO, ILL.	DALLAS, TEX.	MILWAUKEE, WIS.	PHILADELPHIA, PA.	TORONTO, ONT.
BALTIMORE, MD.	CINCINNATI, OHIO	DETROIT, MICH.	MINNEAPOLIS, MINN.	ST. LOUIS, MO.	TRENTON, N. J.
BUFFALO, N. Y.	CLEVELAND, OHIO	HOUSTON, TEX.	NEW YORK, N. Y.	SCRANTON, PA.	WILKES-BARRE, PA.

STANDARDIZED NATIONAL SERVICE BY PAR-LOCK APPLIERS

THE VORTEX MANUFACTURING CO., owner of the Dens-tect Process, furnishes equipment especially designed for application, and manufactures all asphalt materials. The Par-Lock Appliers operate under agreement with THE VORTEX MANUFACTURING CO., insuring application in accordance with proven specifications, the result of experience on a wide variety of work covering thousands of applications throughout the whole country, during a period of fifteen years.

Materials—The asphalt compounds used are blended under strict supervision to produce the specific physical qualities necessary to meet the requirements of each type of service.

All asphalt is applied through equipment especially designed to handle heavy bodied asphalts, insuring greater protection. Exclusive devices have been developed for use in conjunction with the asphalt gun for the application of the various specifications.

Complete Service by Par-Lock Appliers—Par-Lock Appliers, with carefully prepared and tested materials, with specially designed equipment and experienced operatives under supervision of trained engineers, render complete service on all types of dampproofing and waterproofing required in building construction, including the following:

Dampproofing of masonry walls to be plastered direct.
Dampproofing back of furring.
Spandrel beam waterproofing.
Membrane waterproofing for basement walls, floor footings, etc.
Foundation waterproofing for exteriors below grade.
Dampproofing surfaces to be finished with portland cement or tile.
Dampproofing walls to be insulated with corkboard.
Gun-applied protective coatings on cold storage interiors.

Descriptive Literature, Specifications, Data—Write to THE VORTEX MANUFACTURING CO., 1978 West 77th Street, Cleveland, Ohio, or any Par-Lock Applier.

Dens-tect Specification for Interior of Exterior Walls

Dens-tect Treatment—Provides an impervious coating of tangible thickness. Recommended for interior of exterior masonry walls and other masonry surfaces where a higher degree of dampproofing than afforded by regular Par-Lock Plaster Key is required.

Dens-tect
Permanent Plaster Protection

Dens-tect Is Applied by Special Air Gun—The Dens-tect application comprises a heavy gun-applied coating of asphalt and finely graded aggregate thoroughly mixed at the nozzle.

Introduction of the aggregate into the asphalt at high velocity and at right angles to the surface drives it into all minor cracks and crevices common to all masonry, and builds up a heavy, uniform thickness of mastic coating, from six to eight times the thickness of film dampproofing.

Advantages of Dens-tect Wall Treatment—(1) Provides an effective check against wall leakage by filling voids and offering a continuous coating over wall surface.

(2) It supplants furring, saving cost and floor space and eliminates ceiling and floor troubles resulting from moisture which is absorbed through outer wall and transmitted to floor slab from space between wall and inside of furring.

(3) Provides a uniform plaster base, overcoming irregular suction in masonry and insuring uniform quality of plaster-finish and permanence of decoration. Roughened surface formed by aggregate, together with manner in which application follows contour of wall, provides ample bonding properties.

Dens-tect Specification—The interior of all exterior walls above grade shall be treated in accordance with the Dens-tect Specification of THE VORTEX MANUFACTURING CO., Cleveland, Ohio.

Surfaces receiving Dens-tect are to be turned over to Par-Lock Applier clean and free from dirt, oil and other foreign matter, with all large projections removed and all holes and masonry joints pointed up in a workmanlike manner, in proper condition to receive Dens-tect application.

Note: All plastering materials are recommended for use, over this specification, except plasters made of portland cement mortar or putty gauged with portland cement.

Par-Lock Plaster Key for Surfaces to Be Plastered Direct

Par-Lock Treatment—The Par-Lock Plaster Key is a nationally used and approved treatment which dampproofs and at the same time forms a plaster key or bond for ceiling and wall surfaces to be plastered direct.

Par-Lock
The Master Plaster Key

Par-Lock treatment consists of multiple coats of specially blended pure asphalt, gun-applied under high pressures, and a final coat of special graded grit which is likewise mechanically applied to the final coat, providing a positive key of definite strength.

Par-Lock Insures Permanent Plastering—The Par-Lock Plaster Key insures permanent plastering by:

(1) Dampproofing the structural surface back of the plaster.

(2) Providing a key or clutch with a strength many times in excess of the requirements imposed by the weight of the plaster.

(3) Preventing the breakdown of the plaster crystal by reactions which many times result from contact between the structural surface and the plaster.

(4) Adjusting the difference in expansion and contraction between the plaster material and the structural surface.

(5) Overcoming insufficient, excessive or irregular suction in the structural body.

Recommended Applications of Par-Lock Plaster Key—Par-Lock is recommended as preparation for the following surfaces when plastered direct:

(1) Concrete ceilings.
(2) Tile and concrete joist ceilings.
(3) Concrete beams, columns and stair soffits.
(4) Interior of exterior walls.

Plaster Key Specification—All (architect to indicate surfaces here) within the building receiving plaster finish direct are to be prepared for plastering according to Par-Lock Plaster Key Specification of THE VORTEX MANUFACTURING CO., Cleveland, Ohio.

Surfaces receiving Par-Lock are to be turned over to Par-Lock Applier clean and free from dirt, oil and other foreign matter and with all large projections removed and all holes and masonry joints pointed up in a workmanlike manner, in proper condition to receive Par-Lock application.

Note: Any plastering materials may be used over this specification, except plasters made of portland cement mortar or putty gauged with portland cement.

W. F. WEBSTER CEMENT CO.

ESTABLISHED 1848

Manufacturers of Adhesive, Caulking and Waterproofing Compounds

CAMBRIDGE, MASS.

PROTECTIVE AND WATERPROOFING PRODUCTS

WEBTEX PRODUCTS

The W. F. Webster Cement Co. are manufacturers of the following Protective Products for all types of structures from the foundation to the roof.

Spray Mastic; Acoustical Glue; Caulking Compounds; Elastic Cement; Asphalt Waterproofing Compounds; Structural Glass Mastic.

Also Asphalt Emulsions, Paint and Primers; Colorless Waterproofing; Floor or Tile Mastic; Foundation Coatings; Lap Cement; Membrane Fabric; Plaster Bond Damp-proofing; Plastic Cement; Resurfacer; Roof Coating and Oil Cement.

Experience

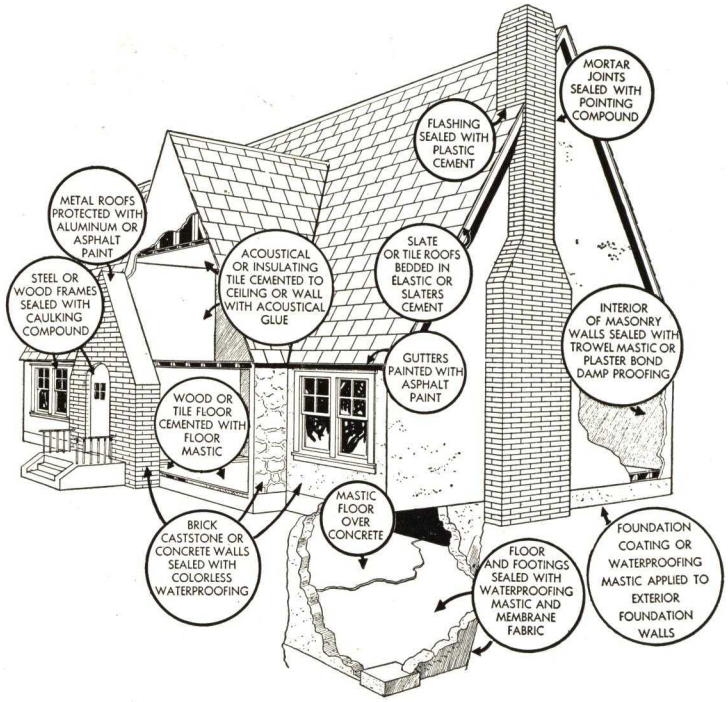
We have been specializing in the manufacture of these adhesive, caulking and waterproofing compounds for nearly a century. The products described are the results of this exceptional experience and long research in our field. They are fully guaranteed to give entire satisfaction when used according to our directions and for the purpose for which they are designed.

The Architect, Engineer, Contractor or Waterproofer is now enabled to secure, *from one source,* a complete line of waterproofing materials.

Caulking Compounds

A plastic and non-staining compound for filling and waterproofing openings under staff beads, around steel or wood sash and pointing mortar joints. Standard colors are limestone, light and dark gray and black in gum consistency. Light gray knife grade. Other colors made to order. The lighter colors can be painted over. The black is an inexpensive compound of maximum durability for use wherever color is not important. One gallon will caulk approximately 100 lin. ft.

Packed in 1 and 5-gal. containers.



Above chart demonstrates the completeness of the Webtex line. Every structural item requiring a special damp-proofing or water seal, from roof shingles to cellar floor is provided for.

Acoustical Glue

A proven cement for securing acoustical and insulating tile and wall board to concrete, metal, plaster or wood surfaces. The surfaces where glue is to be applied must be clean and dry. All loose or blistered paint should be removed and glossy surfaces washed thoroughly with a solution of sal-soda and, if necessary, rough with a wire brush to kill gloss.

Packed in 1, 5 and 7-gallon containers.

Structural Glass Mastic

An asphalt mastic for cementing structural glass to store fronts. Used successfully throughout New England by outstanding contractors.

Packed in 1 and 5-gal. containers.

Resurfacer

This combination of specially prepared asphalts and selected asbestos fibre has been developed for brush application to flat roofs where maximum durability is required.

Packed in 5, 30, and 55 gal. containers.

ELASTIC CEMENT

Webster's original elastic cement has been a standby for over ninety years and is used for bedding slate, caulking boats, setting glass, sealing aquariums and wherever a waterproof cement that can be painted over is required. Colors are reddish brown, black and gray. The gray is particularly made for use with asbestos shingles or as a less expensive caulking and pointing material. Can be used with a caulking gun.

Packed in 2½, 5, 10, and 50-lb. containers.

WATERPROOFING MASTIC

This is an easy working asphalt and asbestos material of troweling or spraying consistency and gives the maximum protection against water when applied on the exterior of foundation walls below grade and on interior of exterior walls above grade. Can be used as a plaster bond and with or without membrane fabric around structural steel on buildings and bridges.

Packed in 5, 30, and 55-gal. containers.

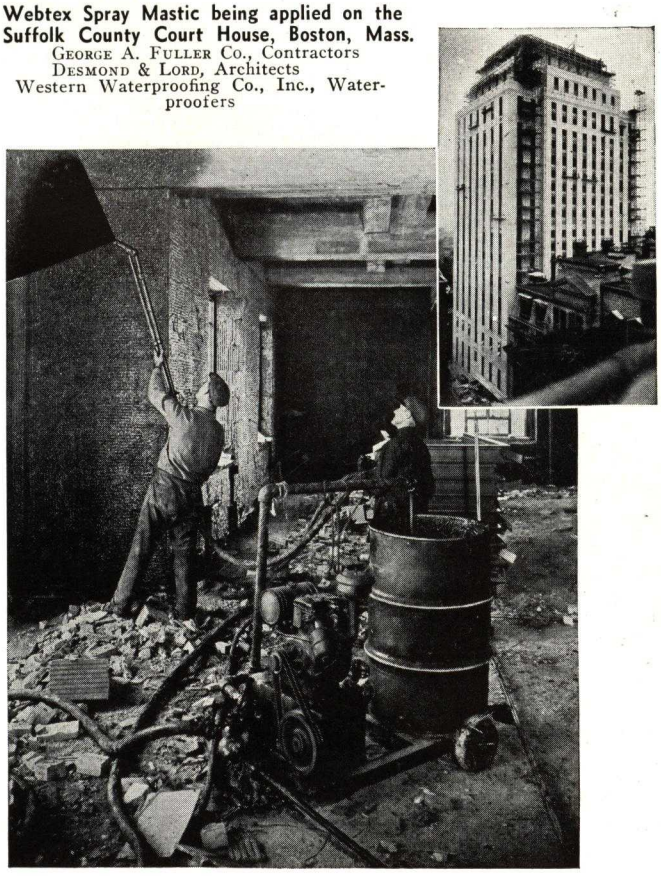
WEBTEX SPRAY MASTIC

The Webster Cement Company, through many years of close contact with the methods employed in the application of waterproofing compounds, recognized the admitted weakness of the ordinary type of damp-proofing, either brushed, sprayed or troweled. As a result of five years of development we are now ready to offer a practical mechanical method of applying a fibrated asphalt mastic through the services of approved waterproofing contractors.

The human element controls the effectiveness of the seal that is obtained when damp-proofing is sprayed or mastic is brushed or troweled. All masonry surfaces are coated with a film of dust which also lines the innumerable small voids. In order to get a complete bond and seal the wall by hand application it is necessary to repeatedly scrub and dab the surface from all angles until the dust is mixed with the mastic. The volume and pressure of the air used in the application of Webtex Spray Mastic is so great that it thoroughly drives all loose dust from the surface to which it is being applied, ensuring intimate and absolute bond with masonry.

High Pressure Application—The Webtex spray machine applies mastic under high pressure, in a fan-like spray, which fills all small cracks and voids, and lines all large holes and crevices leaving a uniform deposit of mastic ⅛ inch thick in one application. Webtex Spray Mastic on drying, forms a tough, rubber-like pebbled coating, unaffected by moisture or temperature changes. If it is desired to plaster directly to Webtex Spray Mastic, a setting time of from one to four weeks, depending upon drying conditions is necessary, due to the thickness of the film.

Webtex Spray Mastic being applied on the Suffolk County Court House, Boston, Mass.
George A. Fuller Co., Contractors
Desmond & Lord, Architects
Western Waterproofing Co., Inc., Waterproofers



SPECIFICATIONS
(For Mastic Damp-proofing)

(1) Material—The material shall be Webtex Spray Mastic, the product of the W. F. Webster Cement Co., Cambridge, Massachusetts, or equal approved in writing by the architect.

(2) Application—All the inside surfaces of all exterior walls where finished with plaster or other finish material, except face brick, shall receive a ⅛ inch coat of mastic damp-proofing applied by spray gun. This mastic damp-proofing shall extend from the ground floor level to the underside of the roof slab. (If furring tile is to be used, mastic should be applied first.)

REPRESENTATIVE INSTALLATIONS

Buildings	Architects	Builders
Suffolk County Court House, Boston, Mass.	Desmond & Lord	George A. Fuller Co.
Philosophy House, St. John's Seminary, Brighton, Mass.	Maginnis & Walsh	Charles Logue Bldg. Co.
Newton Theological Seminary, Newton, Mass.	Kendall Taylor & Co.	James S. Mozzicato
Nurses' Home, Taunton State Hospital, Taunton, Mass.	Kendall Taylor & Co.	M. S. Kelliher Co.

WESTERN WATERPROOFING COMPANIES

Waterproofing and Weatherproofing Contractors and Engineers

ASSOCIATED COMPANIES

MICHIGAN CORPORATION
DETROIT, MICH., Murphy Bldg.
CLEVELAND, OHIO, Builders Exchange Bldg.
TORONTO, ONT., 67 Carlton St.
MONTREAL, QUE., 519 Keefer Bldg.

MISSOURI CORPORATION
ATLANTA, GA., Healey Bldg.
MIAMI, FLA., 16 N. W. 7th St.
CHARLOTTE, N. C., 110 E. 4th St.
ST. LOUIS, MO., Syndicate Trust Bldg.
KANSAS CITY, MO., 723 Finance Bldg.
CHICAGO, ILL., Central Ironite Waterproofing Co., Conway Bldg.
HUNTINGTON PARK, CALIF., Pacific Ironite Co., 2614 Randolph St.
LOS ANGELES, CALIF., A. O. Miller Co., 1920 W. 7th St. (Resto-Crete Only)

PENNSYLVANIA CORPORATION
PHILADELPHIA, PA., Liberty Trust Bldg.
SCRANTON, PA., 711 Linden St.
HARRISBURG, PA., 1515 No. Cameron St.
BALTIMORE, MD., 308 Baltimore Life Bldg.
WASHINGTON, D. C., 1427 Eye St., N. W.

NEW YORK CORPORATION
NEW YORK, N. Y., Grand Central Terminal Bldg.
BOSTON, MASS., 82 W. Dedham St.

OHIO CORPORATION
CINCINNATI, OHIO, Dixie Terminal Bldg.
LOUISVILLE, KY., 14 Eastover Court
INDIANAPOLIS, IND., Lemcke Bldg.
PORTLAND, ORE., Masons Supply Co., 2637 S. E. Twelfth Ave. (Resto-Crete Only)
SEATTLE, WASH., Masons Supply Co., 1331 Third Ave. Bldg. (Resto-Crete Only)

SERVICES

Below Grade Waterproofing by the Ironite System—Hydrostatic heads of water in and around such structures as basement walls and floors, tunnels, sewers, pools, and tanks, have been successfully treated against by this method for over thirty years.

Above Grade Weatherproofing and Decorating by the Resto-Crete System—Renders porous masonry surfaces practically non-capillary by densifying, grout packing applications, and the *proper* installation of flexible joints.

All materials we use are manufactured under our laboratory specifications. No material for sale.

We furnish specifications to fit the job, and all work is guaranteed. Above associated companies are the only licensees for IRONITE and RESTO-CRETE.

THE IRONITE SYSTEM

For Below Grade Waterproofing

Why Ironite?

Water under hydrostatic pressure penetrates masonry by first, the capillarity of the wall, second, through structural and shrinkage cracks, and, third, through porous or honeycombed areas. By applying an IRONITE bearing, densifying layer to such walls (usually on the inside, since this is the easiest to get at), and providing expansion joints or rigid calked joints at cracks, the capillarity may be made so low that no water will pass. IRONITE itself is composed of over 90 per cent chemically pure iron, plus an activating agent, ground to a uniformly graded powdery grit. When water and air contact it, IRONITE oxidizes and swells. In utilizing this valuable property, IRONITE particles are mechanically lodged in porous surfaces, and in the air cells and capillary tubes of concrete left by the evaporation of water upon setting of the cement.

Radio City Building, New York, N. Y.

Basements of four buildings waterproofed using IRONITE

Ironite Is an Efficient Waterproofing

IRONITE jobs done over thirty years ago are in better condition today than when installed, since ground water, prevented from flowing, has caused natural hardening of the concrete. IRONITE will not rot like exterior sealing films which depend for their efficiency upon the forming and retaining of a 100 per cent impervious, flexible film. The Ironite Company of Chicago, Ill., own the trade-mark "IRONITE."

Research Laboratory

Our associated companies maintain a well-equipped and supervised research and testing laboratory in Detroit to help our field engineers and clients. Many problems which require more detailed study than can be made in the field are referred to the laboratory engineers, and thus new and more economical means of protecting buildings and building materials are developed.

Publications—In order to further the knowledge of the art of weatherproofing, our Research Division has prepared Technical Bulletins and the quarterly bulletin, THE RESTO-CRETER, giving the best information on this subject available. These are yours for the asking if you will address the nearest representative or the laboratory.

Representative Ironite Jobs

New York Central Passenger Station, Syracuse, N. Y.
Christian Science Publishing Society Building, Boston, Mass.
Aetna Life Insurance Company Building, Hartford, Conn.
National Press Building, Washington, D. C.
The Cincinnati Time Star Building, Cincinnati, Ohio.
Statler Hotel, St. Louis, Mo., and Boston, Mass.
Anheuser-Busch Co., St. Louis, Mo.
Orthopedic Hospital, University of Chicago.
Hiram Walker Distillery, Peoria, Ill.
Parke-Davis Company Buildings, Detroit, Mich.
Grand Rapids Civic Auditorium, Grand Rapids, Mich.
Dominion Public Building, Toronto, Ont.
Royal Bank, Vancouver, B. C.
Subways and Baths, City of Montreal, Que.

THE RESTO-CRETE SYSTEM

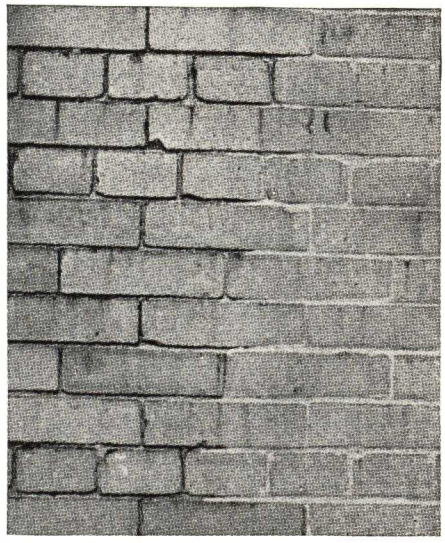
For Weatherproofing and Decorating New and Old Buildings Above Grade

Durable Jobs—What It Takes

The degree of permanence of any building material or surface weatherproofing and decorative material depends upon how well it resists natural weathering forces.

Water penetration is the basic cause of disintegration. Alone, or with acids which it carries in from the air, water will dissolve out soluble components. When it freezes it causes spalling. By alternately saturating and drying off of a surface great stresses are induced; while as water vapor in the air it tends constantly to change the basic moisture content of otherwise dry masonry.

Thus there must be provided first, an effective *stop* to the capillary suction of surfaces, and second, an efficient system of flexible joints between adjacent masses or panels of masonry. The attempt to do both by applying an absolutely impermeable, flexible, long-lasting seal over the outside is practically impossible, since available basic materials do not have these characteristics. Further, a perfect sealing film would have to be applied over all exposed surfaces to be effective, as witnessed by the rapid saturation of the average walls (and often the interiors of buildings as well) when such a film is applied on only one side.



The light-colored joints above have been entirely weatherproofed by grouting cracks and holes with non-capillary RESTO-CRETE *Grout.*

Resto-Crete

By packing the open pores of masonry surfaces with RESTO-CRETE Cement Grout, under our system, on one or both sides, as required, water penetration can be made practically zero, and a wide variety of colors and textures produced. The preparation of old surfaces is often difficult but more necessary than is often appreciated, no matter what the final type of finish treatment is to be.

RESTO-CRETE Cement Grout is our own development and is applied under basic patents. It is composed of special blends of portland cement, IRONITE, and other ingredients which make it more durable than any other cement base material we have ever found, as recent Testing Laboratory results prove. We use many other types of material for specific purposes, all as the result of exhaustive laboratory and field tests before being put into general use. "RESTO-CRETE" is a trade mark owned by the Western Waterproofing Company of Detroit, Mich.

Where Resto-Crete Can Help You

The RESTO-CRETE System in a suitable adaptation is an economical investment for every building owner. On new buildings this is particularly true.

Mortar Joints—In a great majority of buildings, joints leak mainly because mortar shrinks when its cementing medium sets, thus leaving a fine, highly capillary crack between mortar and brick. By forcing RESTO-CRETE grout into these cracks and other holes, the walls are made tighter than by 100% tuck-pointing, and at a substantial saving in cost. Also, tuck-pointing mortar generally used is no better than the original mortar. Where joints are broken out we use a special mortar that has a minimum of shrinkage and capillarity.

Once the joints have been treated, the wall remains dry. If the brick themselves leak, we densify the surface with grout likewise, with out changing the architectural appearance. Higher heat insulation of treated walls generally results. Treatment of the new brick walls eliminates the errors due to workmanship, etc.

Concrete Surfaces—Concrete surfaces can be made so dense by this method that rusting of reinforcing steel, and subsequent spalling of the concrete becomes an impossibility for years. New "architectural concrete" upon stripping the forms can be grouted with RESTO-CRETE using a stone in such a manner that only a final, subsequent, color RESTO-CRETE coat is necessary to make them very highly resistant.

Cinder, Haydite, and Concrete Block Surfaces—Successfully treated by this system at a very reasonable cost. By such treatment, furring often becomes unnecessary.

Limestone Surfaces—When treated with our special limestone shade of RESTO-CRETE Grout, limestone surfaces retain their original looks far longer than when left to "absorb" dirt in their open pores. RESTO-CRETE Grout fills these pores entirely, yet the artistic appearance of the natural grain is left untouched.

Swimming Pools—Swimming pools have always caused trouble to decorators and owners. Our special RESTO-CRETE swimming pool treatment will last many seasons without renewal.

Insulation—Insulation of masonry walls, whether for air conditioning or for cold storage plants and freezers, can be kept dry by using a special RESTO-CRETE method of weatherproofing all sides of such walls.

Special Problems—Special problems involving acid attack require very special treatment. Such problems are always handled direct from the laboratory. May we have your "Special problems" for consideration?

Representative Resto-Crete Jobs

Worcester County Tuberculosis Hospital, Boylston, Mass.
St. Thomas Seminary, Bloomfield, Conn.
Liberty Title & Trust Building, Philadelphia, Pa.
The Chas. McCullough Seed Company, Cincinnati, Ohio
Centre College Stadium, Danville, Ky.
Crunden-Martin Co., St. Louis, Mo.
Bell Telephone Company and A. T. & T. Buildings (over 60 buildings throughout the country)
Art-In-Buttons Co. Plant, Rochester, N. Y.
General Foods Corporation, Post Products Division, Battle Creek, Mich.
Ingraham Building, Miami, Fla.
Lever Bros. Co., Ltd., Toronto, Ontario
Canadian National Railways' Hotels, Halifax, N. S. and Charlottetown, P. E. I.
Grain Elevators, Montreal Harbors Commission

MEMORANDA

ROOFING
- SECTION - 6

Section Number 1/5 Catalog Number

CATALOGS 1 to 56

MANUFACTURERS

THIS INDEX INCLUDES ONLY MANUFACTURERS WHOSE CATALOGS ARE FILED IN THIS SECTION

American Asphalt Roof Corp. 6/11
American Brass Co.
  Copper Roofing 6/35
  Flashings 6/42
American Zinc Institute Inc. 6/36
Barber Asphalt Co., Inc. 6/1
Barnett Canvas Goods & Bag Co., Inc. 6/20
Barrell, William L., Co., Inc. 6/21
Barrett Co. 6/2
Berger Brothers Co. 6/37
Bird & Son, inc.
  Built-up Roofing 6/3
  Shingles 6/12
Buckingham-Virginia Slate Corp. 6/22
Cabot, Samuel, Inc. 6/50
Carey, Philip, Co.
  Built-up Roofing 6/4
  Shingles 6/14
Cartier, M. N., & Sons Co. 6/30
Celotex Co. 6/5
Certain-teed Products Corp. 6/6
Chase Brass & Copper Co., Inc.
  Flashings 6/44
  Roofing Materials 6/38
Cheney Co. 6/43
Colonial Lumber Specialties, Inc. 6/52
Creo-Dipt Co., Inc. 6/51
Edwards Mfg. Co. 6/26
Elhide Co. 6/53
Flintkote Co. 6/13
Hetzel Roofing Products Co. 6/49
Hood, B. Mifflin, Co. 6/28
James Lumber Co. 6/54
Johns-Manville
  Corrugated Asbestos 6/32
  Roofing 6/7
  Shingles 6/15
Keasbey & Mattison Co.
  Roofing and Siding 6/33; 6/33a
  Shingles 6/16
Koppers Co. 6/8
Ledkote Products Co. 6/39
Levow, David 6/31
Long Fir Gutter Co. 6/56
Ludowici-Celadon Co. 6/27
Lyon, Conklin & Co., Inc. 6/40
Majestic Flashing Co. 6/45
Mohawk Asbestos Shingles, Inc. 6/17
Murray Tile Co., Inc. 6/29
North Bangor Slate Co. 6/23
O'Brien Brothers Slate Co., Inc. 6/24
Red Cedar Shingle Bureau 6/55
Reilly Tar & Chemical Corp. 6/10
Revere Copper and Brass Inc. 6/41
Robertson, H. H., Co. 6/34
Roof Specialties Co. 6/46
Ruberoid Co.
  Asbestos Shingles 6/18
  Built-up Roofing 6/9
Sheldon Slate Products Co., Inc. 6/25
Turner Resilient Floors, Inc. 6/47
United States Gypsum Co. 6/19
Wasco Flashing Co. 6/48

PRODUCTS

THIS INDEX INCLUDES ADDITIONAL INFORMATION WHICH IS FILED IN OTHER SECTIONS

Products described or illustrated in manufacturers' catalogs are indexed by section and catalog numbers. All names are listed alphabetically under each product heading.

ASBESTOS
Covered—Sheet Metal
See Sheet Metal — Steel Asbestos Covered

ASPHALT
Basic
Anchor 6/2
Anti-Hydro Waterproofing Co. .. 5/2
Aquabar Waterproofing Products, Inc. 5/3
Barber Asphalt Co., Inc. 6/1
Barrett Co. 6/2
Bird & Son, inc. 6/3
Carey, Philip, Co. 6/14
(Continued in Next Column)

ASPHALT—Cont.
Basic—Cont.
(Continued from Previous Column)
Celotex Co. 6/5
Certain-teed Products Corp. 6/6
Ebonie Black 17/19
Everseal Mfg. Co., Inc. 17/12
Flintkote Co. 6/13
F.W.B. 17/12
Genasco 6/1
Hako 11/49
J-M 6/7
Johns-Manville 6/7
Karnak 5/13
Lewis Asphalt Engineering Corp. 5/13
Manco 6/14
(Continued in Next Column)

ASPHALT—Cont.
Basic—Cont.
(Continued from Previous Column)
Merkin, M. J., Paint Co., Inc. ... 17/19
Nabosar 6/14
Neponset 6/3
Old American 6/11
RPM 7/26
RU-BER-OID 6/9
Ruberoid Co. 6/9
Trinidad 6/1
Viskalt 6/13
Specifications 6/1; 6/6

Cement, see
—Asphalt—Emulsion 5
—Cement—Roofing

ASPHALT—Cont.
Roofing
See Roofing—Built-up—Felt and Fabric; Roofing—Roll
Shingles
See Shingles—Asphalt—Plain or Mineral Surfaced

BLOCKS
Flashing
See Flashing—Blocks, Forms, Receivers
Roof
See Tile—Roofing—Clay or Terra Cotta

BOOTS
Conductor
See Shoes—Leader

CANVAS
Cement
Barnett Canvas Goods & Bag Co., Inc. 6/20
Bartex 6/20
Flashing
See Waterproofing—Felt, Cloth & Fabric
Roofing and Deck
Barco-Dex 6/20
Barnett Canvas Goods & Bag Co., Inc. 6/20
Barrell, William L., Co., Inc. . . . 6/21
Con-Ser-Tex 6/21

CEMENT
Roof Tile Form
See Tile Form—Roofing—Reinforced Cement
Roofing
Barber Asphalt Co., Inc. 6/1
Bird & Son, inc. 6/3
Carey, Philip, Co. 6/4
Celotex Co. 6/5
Certain-teed Products Corp. . . . 6/6
Everseal Mfg. Co., Inc. 17/12
F.W.B. 17/12
Genasco 6/1
Glidden Co. 17/14
Hetzel Roofing Products Co. . . . 6/49
Karnak 5/13
Koppers Co. 6/8
Lastik Products Co., Inc. 5/14
Lewis Asphalt Engineering Corp. 5/13
Merkin, M. J., Paint Co., Inc. . 17/19
Neponset 6/3
Pecora Paint Co., Inc. 18/14
Perfectseal 17/19
Ru-Ber-Oid 6/18
Ruberoid Co. 6/18
Solar 6/5
Weathertite 18/14
Webster, W. F., Cement Co. . . . 5/26
Webtex 5/26
See also 4/53; 6/14; 6/49
Slater's
See Cement—Roofing

COATINGS
Roof
See Asphalt—Basic; Roofing—Built-up

CONDUCTORS
Leader Pipe—Cast Lead and/or Lead Coated Copper
Ledkote Products Co. 6/39
Specifications 6/39
Leader Pipe—Copper
Chase Brass & Copper Co., Inc. 6/38
Hussey, C. G., & Co. 13/4
Revere Copper and Brass Inc. . . 6/41
Leader Pipe—Iron
Republic Steel Corp. 13/5
Toncan 13/5
See also 13/20

CONDUCTORS—Cont.
Leader Pipe—Shoes and/or Protection
See Shoes—Leader
Leader Pipe—Steel
B.B. 6/37
Lyon, Conklin & Co., Inc. 6/40
Lyonore Metal 6/40
Quaker City 6/37
Pipe—Fasteners and Fittings for
B.B. 6/37
Berger Brothers Co. 6/37
Berloy 9/1
Chase Brass & Copper Co., Inc. . 6/38
Fitrite 6/31
Ledkote Products Co. 6/39
Levow, David 6/31
Paine Co. 16/45
Re-Expan 6/39
Rival 6/37
Snugfit 16/45
Specifications 6/31; 6/39

CONDUIT
Tin or Terne Plate
RPM 7/26

CONNECTIONS
Roof—Leader and Vent
See Vent Connections—Roof

CONTRACTORS AND ENGINEERS
Roof Construction
American Cyanamid & Chemical Corp. 3/26
Arch Roof Construction Co., Inc. 3/16
Federal-American Cement Tile Co. 3/32
Guastavino, R., Co. 10/40
Lathrop-Hoge Gypsum Construction Co. 3/27
Roberts and Schaefer Co. 3/12
USG 3/29
"Unit" Structures, Inc. 3/20
United States Gypsum Co. 3/29

COPPER
Roofing
See Roofing—Copper

CORNICES
Sheet Metal
(See also Sheet Metal Work; —Ornamental—Metal Work . . . 13)
Leadtex 6/41
Revere Copper and Brass Inc. . . . 6/41
See also 28/29

CORRUGATED
Sheet Metal—Asbestos Covered
See Sheet Metal—Steel—Asbestos Covered

DOWNSPOUTS
Metal
See Conductors—Pipe

DUCTS
Pipe
See Conduit—Tin or Terne Plate

EAVES
Troughs
See Gutters—Roof; Sheet Metal Work

ELBOWS
Conductor Pipe
See Conductors—Pipe

ELLS
Conductor Pipe
See Conductors—Pipe

ENGINEERS
Roof Construction
See Contractors and Engineers

EXPANSION
Joints
See Joints—Expansion—Roof

FABRIC
Flashing
See Waterproofing—Felt, Cloth or Fabric 5

FASTENERS
Conductor Pipe
See Conductors Pipe—Fasteners and Fittings for

FELT
House Insulating
See Paper and Felts—Building
Insulating
See Paper and Felts—Building
Roofing—Asphalt Saturated, Raybestos, Tarred, etc.
(See also Roofing)
Asbescoat 6/9
Barber Asphalt Co., Inc. 6/1
Barrett Co. 6/2
Bird & Son, inc. 6/3
Carey, Philip, Co. 6/4; 6/14
Carey-Seal 6/4
Certain-teed Products Corp. . . . 6/6
Feltex 6/4
Fiberock 6/4; 6/14
Flintkote Co. 6/13
Genasco 6/1
J-M 6/7
Johns-Manville 6/7
Koppers Co. 6/8
Neponset 6/3
Roofinsul 6/7
RU-BER-OID 6/9
Ruberoid Co. 6/9
Viskalt 6/13
White Top 6/14
Specifications 6/2; 6/6; 6/7; 6/8
Sound Deadening
See Paper and Felts—Building

FLASHING
Bituminous
Barrett Co. 6/2
Elastigum 6/2
Specifications 6/2
Blocks, Forms, Receivers, etc.
Asbestile 6/7
Barrett Co. 6/2
Certain-teed Products Corp. 6/6
J-M 6/7
Johns-Manville 6/7
Roof Specialties Co. 6/46
Wee-per 6/46
Specifications . . 6/2; 6/6; 6/7; 6/46

FLASHINGS
Combination Metal and Fiber or Fabric
Angier Corp. 10/1
Brisk Waterproofing Co., Inc. . . 5/4
Byers 6/47
Celotex Co. 6/5
Copper Armored Sisalkraft 10/2
Copperskin 10/1
Larson 5/4
Roof Specialties Co. 6/46
Sisalkraft Co. 10/2
Tri-Lok 6/46
Turner Resilient Floors, Inc. . . . 6/47
Wasco Flashing Co. 6/48
Wee-per 6/46
Specifications 6/5; 6/46; 10/2
Fabric, Asbestos, etc.
See Waterproofing—Felt, Cloth and Fabric 5

FLASHINGS—Cont.

Pipe Flange

Barrett Co. 6/2; 27/19
Josam Mfg. Co. 27/20
Specifications 6/2; 27/19

Plastic

Barber Asphalt Co., Inc. 6/1
Bird & Son, inc. 6/3
Carey, Philip, Co. 6/4
Genasco 6/1
Holt 6/2; 27/19
J-M 6/7
Johns-Manville 6/7
Koppers Co. 6/8
Neponset 6/3
Specifications 6/3; 6/8
Barrett-Holt 6/2; 27/19

Sheet Metal

(See also Sheet Metal Work)
American Brass Co. 6/35; 6/42
Anaconda 6/35; 6/42
Barrett Co. 6/2
Byers 6/47
Certain-teed Products Corp. 6/6
Chase Brass & Copper Co., Inc. 6/44
Cheney 6/41; 6/43
Cheney Co. 6/43
Cop-O-Top 6/44
Duplex 6/44
Edwards Mfg. Co. 6/26
Hussey, C. G., & Co. 13/4
Leadtex 6/41
Ledkote Products Co. 6/39
Majestic Flashing Co. 6/45
Majestic 3-Way 13/4
Republic Steel Corp. 13/5
Revere 6/43
Revere Copper and Brass Inc. 6/41
RPM 6/34
Robertson, H. H., Co. 6/34
Super-Bond 6/45
Toncan 13/5
Treplex 6/44
Turner Resilient Floors, Inc. 6/47
See also 6/38
Specifications 6/2; 6/26; 6/35; 6/39; 6/41; 6/42; 6/43; 6/44; 6/45; 6/47

FLOORING

Wood—Air and Moisture Protection

See Paper and Felts—Building

FORMS

Flashing

See Flashing—Blocks, Forms, Receiver, etc.

GUARDS

Snow

B.B. 6/37
Berger Brothers Co. 6/37
Cartier, M. N., & Sons Co. 6/30
Clason 6/30
Clason Special 6/30
Fitrite 6/31
Levow, David 6/31
Protector 6/31
See also 6/38
Specifications 6/30; 6/31

GUTTERS

Hangers for

See Hangers—Gutter

Roof

B.B. 6/37
Berloy 9/1
Chase Brass & Copper Co., Inc. .. 6/38
Hussey, C. G., & Co. 13/4
Improved 6/56
Ledkote Products Co. 6/39
Long Fir Gutter Co. 6/56
Lyon, Conklin & Co., Inc. 6/40
Lyonore Metal 6/40
(Continued in Next Column)

GUTTERS—Cont.

Roof—Cont.

(Continued from Previous Column)
Quaker City 6/37
Republic Steel Corp. 13/5
Revere Copper and Brass Inc. .. 6/41
Shadowline 6/56
Toncan 13/5
Specifications 6/39; 6/56

GYPSUM

Pre-Cast Roofs

See Roof Construction—Gypsum 3

Roof Tile

See Roof Construction—Gypsum 3

HAIR

Felt

See Paper and Felts—Building

HANGERS

Gutter

B.B. 6/37
Berger Brothers Co. 6/37
Berloy 9/1
Gem 6/37
Hussey, C. G., & Co. 13/4
Penn 6/37
Rival 6/37
See also 6/38; 13/25

HEADS

Leader—Cast Lead and/or Lead Coated Copper

Ledkote Products Co. 6/39
Specifications 6/39

Leader—Copper

See also 6/38; 13/25

HOODS

Sheet Metal

See Sheet Metal Work—General

HOOKS

Conductor Pipe

See Conductor Pipe—Fasteners for

HOUSE AND ROOF

Insulation

See Paper and Felts—Building

INSULATION—HOUSE

Felt

See Paper and Felts—Building

Floors, Walls, Roofs and Ceilings

See Felt—Roofing; Paper and Felts—Building

Paper

See Paper and Felts—Building

JOINTS

Expansion—Roof Mastic

Barrett Co. 6/2
Elastigum 6/2
Specifications 6/2

Pipe—Cement for

Hetzel Roofing Products Co. 6/49
Sika Inc. 5/17

LEADER

Connections—Roof

See Vent Connections—Roof

Drains—Roof

See Vent Connections—Roof

Heads

See Heads—Leader

Pipe

See Conductor—Leader Pipe

Pipe—Fasteners

See Conductors—Pipe—Fasteners and Fittings for

Pipe Shoes or Protectors

See Shoes—Leader

Shoes or Boots

See Shoes—Leader

LININGS

Paper

See Paper and Felts—Building

LUMBER

Asbestos

See Siding—Asbestos-Cement; Roofing—Asbestos—Plain or Corrugated

NAILS

Slating, Shingle, Siding, etc.

Creo-Dipt Co., Inc. 6/51

PAPER AND FELTS

Building

Angier Corp. 10/1
Bird & Son, inc. 6/12
Brownskin 10/1
Carey, Philip, Co. 6/14
Celotex Co. 6/5
Copper Armored Sisalkraft 10/2
Copperskin 10/1
Creo-Dipt Co., Inc. 6/51
Fibrewove 6/14
Flintkote Co. 6/13
Insulite Co. 10/27
J-M 6/7
Johns-Manville 6/7
Leonard, P. C. Co. 10/17
Neponset 6/12
Neponset Black 6/3
Old American 6/11
Polar 6/14
Reynolds Metals Co., Inc. 10/5
Rollboard 10/49
Ru-Ber-Oid 6/18
Ruberoid Co. 6/18
Safe-n-dry 6/18
7-Ply 6/18
Sisalkraft Co. 10/2
Specialty Converters, Inc. 10/6
Tufcote 10/6
Tufmat 10/6
Tuftite 10/27
Tytewrap 10/6
Upco 10/6
Specifications 6/5; 6/51; 10/1; 10/2; 10/6

PIPE

Conductors

See Conductors—Leader Pipe

Joint Compounds—For Roof

Hetzel Roofing Products Co. 6/49
See also 4/41

PITCH

Roofing, Waterproofing, Paving, etc.

(Including Steep Roofing)
(See also Waterproofing—Paint and Compounds) 5
Barrett Co. 6/2
Bird & Son, inc. 6/3
Carey, Philip, Co. 6/4
Carey-Seal 6/4
Celotex Co. 6/5
Certain-teed Products Corp. 6/6
Flintkote Co. 6/13
J-M 6/7
Johns-Manville 6/7
Koppers Co. 6/8
Neponset 6/3
Reilly Tar & Chemical Corp. .. 6/10
RU-BER-OID 6/9
Ruberoid Co. 6/9
Tarmac 6/8
See also 11/81
Specifications 6/2; 6/6; 6/8

PLATES

Iron or Steel

See Sheet Metal—Ingot—Iron

PROTECTED
Steel
See Sheet Metal—Steel Asbestos Covered

PROTECTORS
Conductor and Sewer Pipe
See Shoes—Leader

RAGGLE
Blocks
See Flashing—Blocks, Forms, Receivers, etc.

RIDGE ROLLS OR STRIPS
Metal
Berloy 9/1
Hussey, C. G., & Co. 13/4
Republic Steel Corp. 13/5
Toncan 13/5
See also 6/38

Prepared or Ready — Plain or Surfaced
See Roofing—Roll—Prepared or Ready —Plain or Surfaced

ROOF
Flashing
See Flashings—Sheet Metal
Insulation, see
—Paper and Felts
—Insulation House 10
—Roof Construction—Gypsum. 3
Repairing Material—Mastic
See Cement—Roofing
Snow Guards
See Guards—Snow
Tile
See Tile Form—Roofing

ROOFING
Asbestos — Cement — Plain or Corrugated
Carey, Philip, Co. 6/14
Careystone 6/14
Century 6/33a
Flintkote Co. 6/13
J-M 6/7; 6/15; 6/32
Johns-Manville 6/7; 6/15; 6/32
K&M 6/33; 6/33a
Keasbey & Mattison Co. 6/33; 6/33a
Trafford Tile 6/33
Transite 6/7; 6/32
W-R 6/33
Woodgrain 6/13
Specifications 6/7; 6/33; 6/33a

Asphalt
See Roofing—Built-up—Felt and Fabric; Shingles—Asphalt—Asbestos

Built-up—Felt and Fabric
American Asphalt Roof Corp. ... 6/11
Asbescoat 6/9
Barber Asphalt Co., Inc. 6/1
Barrett Co. 6/2
Bird & Son, inc. 6/3
Carey, Philip, Co. 6/4
Celotex Co. 6/5
Certain-teed Products Corp. ... 6/6
Flintkote Co. 6/13
Genasco 6/1
J-M 6/7
Johns-Manville 6/7
Koppers Co. 6/8
Neponset 6/3
Old American 6/11
Reilly Tar & Chemical Corp. ... 6/10
Roofinsul 6/7
RU-BER-OID 6/9
Ruberoid Co. 6/9
Trinidad 6/1
(Continued in Next Column)

ROOFING—Cont.
Built-up—Felt and Fabric—Cont.
(Continued from Previous Column)
Viskalt 6/13
See also 10/23
Specifications 6/1; 6/2; 6/3; 6/4; 6/5 6/6; 6/7; 6/8; 6/9; 6/10; 6/11

Canvas
See Canvas

Cement
See Cement—Roofing

Contractors
See Contractors—Roof Construction

Copper
American Brass Co. 6/35
Anaconda 6/35
Chase Brass & Copper Co., Inc. .. 6/38
Electro-Sheet 6/35
Hussey, C. G., & Co. 13/4
Leadtex 6/41
Plumrite 27/8
Pure Lake 13/4
Revere Copper and Brass Inc. 6/41
Specifications 6/35; 6/41

Corrugated — Asbestos-Cement Covered Metal
See Roofing—Asbestos-Cement Plain or Corrugated

Felt
See Roofing—Built-up—Felt and Fabric; Roofing — Roll — Prepared or Ready; Felt—Roofing

Ingot Iron — Corrugated, Roll, Standing Seam and V-Crimp
American Zinc Institute Inc. 6/36
Seal of Quality 6/36

Iron, Copper, Alloyed, Galvanized —Flat, Corrugated, Beaded, etc.
Berloy 9/1
Republic Steel Corp. 13/5
Toncan 13/5

Lead Coated
Ledkote Products Co. 6/39

Paper
See Paper or Felts—Building

Roll—Prepared or Ready—Plain or Surfaced
American Asphalt Roof Corp. .. 6/11
Barber Asphalt Corp. 6/1
Bird & Son, inc. 6/3
Bullseye 6/14
Careypoint 6/14
Carey, Philip, Co. 6/14
Celotex-Blockedge 6/5
Celotex Co. 6/5
Celotex-Diamond Point 6/5
Dur-A-Seal 6/14
Fiberock 6/14
Flintkote Co. 6/13
Genasco 6/1
Guardian 6/13
Lastile 6/14
Mica-Kote 6/14
Neponset 6/3
Old American 6/11
Philco 6/14
Reliance 6/13
Rex 6/13
Ru-Ber-Oid 6/18
Ruberoid Co. 6/18
Servall 6/5
Simplex 6/14
Solar 6/5
Solka 6/14
Stalwart 6/13
Super-Grade 6/5
Super-Lastile 6/14
Surety 6/14
Specifications 6/3; 6/5; 6/18

ROOFING—Cont.
Roll—Sheet Metal
American Brass Co. 6/35
Anaconda 6/35
Electro-Sheet 6/35
Leadtex 6/41
Lyonore Metal 6/40
Republic Steel Corp. 13/5
Revere Copper and Brass Inc. 6/41
Toncan 13/5
U.S.S. 13/7
United States Steel Corp. Subsidiaries 13/7
See also 7/27
Specifications 6/35

Shingles
See Shingles—Specific Type

Slate
See Shingles—Slate

"Specifications"
See Roofing—Built-up

Steel, Asbestos Covered—Flat, Corrugated, Beaded
RPM 6/34
Robertson, H. H., Co. 6/34

Steel, Copper Alloyed—Flat, Corrugated, Beaded, Formed, V-Crimp, etc.
United States Gypsum Co. 3/29
USG 3/29
Specifications 3/29

Steel—Plain, Galvanized, Black or Painted — Corrugated, V-Crimp, Beaded, etc.
American Zinc Institute Inc. 6/36
Berloy 9/1
Cop-R-Loy 27/6
Milcor Steel Co. 3/24
Republic Steel Corp. 13/5
Seal of Quality 6/36
Triple Drain 13/5
USS 13/7
United States Steel Corp. Subsidiaries 13/7

Tar and Gravel
See Roofing—Built-up—Felt and Fabric

Tile
See Tile Form—Roofing

Tin and Terne Plate
Berloy 9/1
Lyon, Conklin & Co., Inc. 6/40
Lyonore Metal 6/40
Republic Steel Corp. 13/5
Taylor 13/5
U.S.S. 13/7
United States Steel Corp. Subsidiaries 13/7

Wrought Iron
Byers, A. M., Co. 27/1

SHAKES
Shingle
See Shingle—Shakes

SHEATHING OR SIDING MATERIAL
See Paper and Felts—Building; Siding

SHEET METAL
(See also Metals) 13

Annealed and Black Sheets—Flat and Corrugated
Republic Steel Corp. 13/5
Toncan 13/5

Asbestos Covered
See Sheet Metal—Steel Asbestos Covered—Flat, Corrugated, Beaded, etc.

SHEET METAL—Cont.

Copper—Lead Coated
See Sheet Metal—Lead Coated

Fasteners—Corrugated Metal
See Fasteners—Corrugated Metal

Ingot Iron—Galvanized, Blue, Annealed—Flat and Corrugated
American Zinc Institute Inc. ... 6/36
Republic Steel Corp. ... 13/5
Seal of Quality ... 6/36
Toncan ... 13/5

Iron, Copper Alloyed—Galvanized—Flat, Corrugated, Beaded, etc.
Cop-R-Loy ... 27/6
Republic Steel Corp. ... 13/5
Toncan ... 13/5
Wheeling Steel Corp. ... 27/6

Lead Coated
American Brass Co. ... 6/35
Anaconda ... 6/35
Chase Brass & Copper Co., Inc. 6/38
Hussey, C. G., & Co. ... 13/4
Leadtex ... 6/41
Ledkote Products Co. ... 6/39
Revere Copper and Brass Inc. ... 6/41
Specifications ... 6/35; 6/41

Steel and Asbestos—Copper Covered
RPM ... 6/34
Robertson, H. H., Co. ... 6/34

Steel—Asbestos Covered—Flat, Corrugated, Beaded, etc.
RPM ... 6/34
Robertson, H. H., Co. ... 6/34

Steel—Copper Alloyed—Flat, Galvanized, Corrugated, Beaded, Formed, etc.
Cop-R-Loy ... 27/6
Inland Steel Co. ... 11/85
Wheeling Steel Corp. ... 27/6

Steel—Galvanized or Black—Flat, Corrugated, Beaded, Formed, etc.
American Zinc Institute Inc. ... 6/36
Cop-R-Loy ... 27/6
Lyon, Conklin & Co., Inc. ... 6/40
Lyonore Metal ... 6/40
Seal of Quality ... 6/36

SHEET METAL WORK

General
B.B. ... 6/37
Cheney Co. ... 6/43
Lyonore Metal ... 6/40
Mitco ... 11/89
RPM ... 7/26
See also .. 7/10; 7/27; 14/17; 21/51

SHINGLES

Asbestos-Cement
Carey, Philip, Co. ... 6/14
Careystone ... 6/14
Cedargrain ... 6/15
Century ... 6/16
Eternit ... 6/18
Eternit Timbertex ... 6/18
Flintkote Co. ... 6/13
Insulite Co. ... 10/27
J-M ... 6/15
Johns-Manville ... 6/15
K&M ... 6/16
Keasbey & Mattison Co. ... 6/16
Mohawk Asbestos Shingles, Inc. 6/17
Mohawkstonne ... 6/17
Mohawktyle ... 6/17
Plymouth ... 6/17
Ru-Ber-Oid ... 6/18
(Continued in Next Column)

SHINGLES—Cont.

Asbestos-Cement—Cont.
(Continued from Previous Column)
Ruberoid Co. ... 6/18
Salem ... 6/15
Stonnetexture ... 6/17
Timbertex ... 6/18
USG ... 6/19
United States Gypsum Co. ... 6/19
Williamsburg ... 6/17
Woodgrain ... 6/13
Specifications ... 6/17; 6/18

Asphalt—Cork Insulated
Carey, Philip, Co. ... 6/14

Asphalt—Plain or Mineral Surfaced—Individual or Strip
American Asphalt Roof Corp. ... 6/11
Asfaltslate ... 6/14
Barb-Lock ... 6/1
Barber Asphalt Co., Inc. ... 6/1
Bird & Son, inc. ... 6/12
Carey, Philip, Co. ... 6/14
Careylok ... 6/14
Celotex Co. ... 6/5
Duo-Blend ... 6/15
Edgseal ... 6/5
Flintkote Co. ... 6/13
4-Point ... 6/1
Genasco ... 6/1
Heavytab ... 6/11
Hex-Lox ... 6/5
J-M ... 6/15
Johns-Manville ... 6/15
Jumbo ... 6/18
Latite ... 6/1
Lok-Lay ... 6/5
Mas-Tab ... 6/1
Neponset ... 6/3
Old American ... 6/11
Ru-Ber-Oid ... 6/18
Ruberoid Co. ... 6/18
Sealbac ... 6/1
Setab ... 6/13
Shad-O-Grain ... 6/5
Sta-Rite ... 6/1
Thikbut ... 6/13
Ver-Style ... 6/5
Weather-tex ... 6/12
Winthrop ... 6/13
Specifications 6/5; 6/11; 6/13; 6/18

Cement
Federal-American Cement Tile Co. ... 3/32
Porete Mfg. Co. ... 3/35
Specifications ... 3/32

Metal
Edwards Mfg. Co. ... 6/26
Specifications ... 6/26

Shakes
Blue Jay ... 6/54
Cabot, Samuel, Inc. ... 6/50
Carey, Philip, Co. ... 6/14
Careystone ... 6/14
Colonial Lumber Specialties, Inc. 6/52
Creo-Dipt Co., Inc. ... 6/51
Early American ... 6/52
Elhide Co. ... 6/53
James Lumber Co. ... 6/54
Specifications ... 6/51; 6/52; 6/54

Slate
Allenstone ... 4/13
Bangor ... 6/23
Buckingham-Virginia Slate Corp. 6/22
Hamm, S. H., & Son ... 21/8
North Bangor Slate Co. ... 6/23
O'Brien Brothers Slate Co., Inc. 6/24
Penn-Mont ... 11/25
Pyramid ... 11/25
Rees-Volckmann Co., Inc. ... 4/9
Sheldon Slate Products Co., Inc. 6/25
Structural Slate Co. ... 11/25
Super-Slate ... 21/8
Vermont Structural Slate Co. ... 4/13
Specifications ... 6/22; 6/23
See also ... 6/53; 21/79

SHINGLES—Cont.

Tile
See Tile—Roofing; Tile Form—Roofing

Wood—Hand Split
(See also Shakes)
Blue Jay ... 6/54
Cabot, Samuel, Inc. ... 6/50
Colonial Lumber Specialties, Inc. 6/52
Creo-Dipt Co., Inc. ... 6/51
Early American ... 6/52
Elhide Co. ... 6/53
James Lumber Co. ... 6/54
Pilgrim ... 6/51
Yorktown ... 6/51
Specifications ... 6/51; 6/52; 6/54

Wood—Sawed—Natural or Colored
Ambassadors ... 6/51
Cabot, Samuel, Inc. ... 6/50
California Redwood Assn. ... 8/10
Certigrade ... 6/55
Creo-Dipt Co., Inc. ... 6/51
Red Cedar Shingle Bureau ... 6/55
See also ... 6/54
Specifications ... 6/51; 6/55

SHOES

Leader
Armored Concrete Corp. ... 13/44
Canton Foundry & Machine Co. Div. of The Hill Clutch Machine & Foundry Co. ... 13/43
Fiske, J. W., Iron Works ... 13/20
Hussey, C. G., & Co. ... 13/4
Universal ... 13/43
See also ... 6/38; 13/25
Specifications ... 13/43

SIDING
(See also Shingles)

Asbestos-Cement
Carey, Philip, Co. ... 6/14
Careystone ... 6/14
Cedargrain ... 6/15
Celotex Corp. ... 10/22
Cemesto ... 10/22
Century ... 6/16; 6/33a
Eternit ... 6/18
Flintkote Co. ... 6/13
Insulite Co. ... 10/27
J-M ... 6/15; 6/32
Johns-Manville ... 6/15; 6/32
Keasbey & Mattison Co. ... 6/16; 6/33; 6/33a
K&M ... 6/16; 6/33; 6/33a
Ru-Ber-Oid ... 6/18
Ruberoid Co. ... 6/18
Salem ... 6/15
Timbertex ... 6/18
Trafford Tile ... 6/33
Transite ... 6/32
USG ... 6/19
United States Gypsum Co. ... 6/19
W-R ... 6/33
Woodgrain ... 6/13
Specifications ... 6/18; 6/33; 6/33a

Asphalt—Plain or Mineral Surfaced
Barb-Lock ... 6/1
Barber Asphalt Co., Inc. ... 6/1
Bird & Son, inc. ... 6/12
Brik-Face Edgseal ... 6/5
Briklite ... 10/27
Celotex ... 6/5
Duo-Blend ... 6/15
Flintkote Co. ... 6/13
4-point ... 6/1
Genasco ... 6/1
(Continued on Next Page)

SIDING—Cont.

Asphalt—Plain or Mineral Surfaced—Cont.

(Continued from Previous Page)

Insulated Bric 6/12
Insulite Co. 10/27
J-M 6/15
Johns-Manville 6/15
Latite 6/1
Mas-Tab 6/1
Neponset 6/3
Ru-Ber-Oid 6/18
Ruberoid Co. 6/18
Sealbac 6/1
Sta-Rite 6/1
Specifications 6/5; 6/18

Roll or Strip—Prepared or Ready

See Shingles—Asphalt—Mineral Surfaced—Individual or Strip; Roofing—Roll—Prepared or Ready—Plain or Surfaced

Sheet Metal

See Sheet Metal

Shingles

See Shingles

Wood

(See also Shingles—Wood)

Anzac 8/10
Cabot, Samuel, Inc. 6/50
California Redwood Assn. 8/10
Certigrade 6/55
Koppers 8/7
Red Cedar Shingle Bureau 6/55
See also 6/54
Specifications 6/55; 8/10

SLABS

Precast—Concrete

See Tile Form—Roofing—Reinforced Cement

Reinforced Cement or Concrete Tile

See Tile Form—Roofing

SLATE

Roofing

See Shingles—Slate

SLEEVES

Flashings—Vent Stack

See Vent Connections—Roof

SNOW

Guards

See Guards—Snow

SPANDRELS

Felt, Cloth or Fabric

See Flashings—Fabric

Lead Covered Sheet Metal

See Sheet Metal—Lead Coated

Waterproofing—Metal for

Leadtex 6/41
Revere Copper and Brass, Inc. ... 6/41

STRAPS

Leader Pipe

See Conductors—Pipe—Fasteners and Fittings for

TAR

Pitch

See Pitch—Roofing, Waterproofing, Paving, etc.

TARPAULINS

Barco 6/20
Barnett Canvas Goods & Bag Co., Inc. 6/20

TERRA COTTA

Roofing—Tile

See Tile—Roofing—Clay or Terra Cotta

TILE

Roofing—Clay or Terra Cotta

(See also Contractors—Roof Construction)

Atlantic Terra Cotta Co. 4/22
Dek-Tile 4/42
Hood, B. Mifflin, Co. 6/28
Kil-Kraft 6/28
Ludowici-Celadon Co. 6/27
Murray Tile Co., Inc. 6/29
Natco 4/42
National Fireproofing Corp. 4/42

(Continued in Next Column)

TILE—Cont.

Roofing—Clay or Terra Cotta—Cont.

(Continued from Previous Column)

Rough Velvet 6/29
Rustic 6/29
Saxony 6/29
Victorian 6/29
Specifications 6/29

TILE FORM

Roofing—Asbestos-Cement

K&M 6/33
Keasbey & Mattison Co. 6/33
Mohawk Asbestos Shingles, Inc. 6/17
Trafford 6/33
W-R 6/33
Specifications 6/33

Roofing—Metal

Edwards Mfg. Co. 6/26
Specifications 6/26

Roofing—Reinforced Cement

Federal-American Cement Tile Co. 3/32
Porete Mfg. Co. 3/35
Rackle, Geo., & Sons Co. 3/36
Truscon Laboratories 3/37
Specifications 3/32; 3/36

TROUGHS

Eaves

See Gutters—Roof

UTILITY

Shank for Roof Gutters

B.B. 6/37
Berger Brothers Co. 6/37

VENT CONNECTIONS

Roof

See Flashing—Pipe Flange

WIRE

Snow Guards

See Guards—Snow

WOOD

Shingles

See Shingles—Wood

TRINIDAD LAKE ASPHALT PRODUCTS

Barber Asphalt Corporation

BARBER, N.J.

NEW YORK

MADISON, ILL.

CHICAGO

BARBER *Genasco* and *The Vital Element*

The Names That Mean Most In Asphalt

The Vital Element

The Vital Element—Trinidad Native Lake Asphalt—was made by Nature. It is "mined" from the asphalt lake on the Island of Trinidad shown in the map above.

HISTORICAL FACTS

For millions of years *The Vital Element*—Trinidid Native Lake Asphalt—has been constantly "stirred" by Nature . . . exposed to the scorching rays of a year-round summer sun . . . the fury of tropical tempests.

Trinidad Native Lake Asphalt has come through these centuries with a natural vitality which it retains indefinitely.

DESCRIPTION

Trinidad is an intimate mixture of an extremely adhesive bitumen and inherent mineral filler so dispersed in the asphalt as to be in colloidal suspension.

The bitumen has unparalleled ductility, indicating extreme *self-healing and adhesive qualities.*

The colloidal mineral filler accounts for the great toughness, indicating *cohesiveness.*

Trinidad is unique in combining these two vitally necessary properties in a well balanced ratio.

WHERE MODERN MATERIALS MEET

Modern construction demands modern materials. Where modern materials meet, *The Vital Element*—Trinidad Native Lake Asphalt—is right at home. Combining a properly balanced ratio of adhesiveness (indicating self-healing properties) to cohesiveness (toughness) *The Vital Element* meets every demand of modern construction practice.

BE SURE OF GETTING THE BEST

By specifying Barber Genasco you can be sure of getting the *most* in asphalt because only in Barber Genasco Built-up Roofings . . . Shingles . . . Mastic Floorings . . . will you find *The Vital Element.*

Barber Genasco Trinidad Lake Asphalt Built-up Roofings consist of alternate layers of Barber Genasco All-Rag or Asbestos Felts cemented together with Trinidad Lake Roofing Asphalt containing *The Vital Element.* Both laboratory and service tests have convinced Architects and those in charge of roof maintenance that Barber Genasco Trinidad Lake Asphalt Roofs give longer service. They will be bonded for 10, 15 or 20 years, depending upon the type of roofing applied.

Barber Genasco Asphalt Shingles used for residential roofing, containing *The Vital Element*—have been proved best by the Triple Test—The Test of Time—the Slam Test—and the Weather-Ometer Test.

"ASPHALT HEADQUARTERS"

Barber Asphalt Corporation is the largest miner, refiner and distributor of native lake asphalt in the world. For nearly three-quarters of a century Barber has been producing high-grade asphalt . . . has been specializing in asphalt in research, and today all this knowledge and experience is at your disposal.

Barber is ready to serve you . . . to acquaint you with the possibilities and limitations of asphalt in building construction. Your inquiries will be welcomed without cost or obligation.

The Barber Genasco Line of Asphalt Products Includes:

SHINGLES • SIDINGS • ROLL ROOFINGS • BUILT-UP ROOFINGS

MASTIC FLOORINGS : WATERPROOFING ASPHALTS AND FABRICS : DAMPPROOFING ASPHALTS : ASPHALT PROTECTIVE PRODUCTS (Plastics and Liquids)
SPANDREL BEAM WATERPROOFING (Spandrel Cloth and Cement) : RESATURATORS AND RESURFACERS

BARBER ASPHALT CORPORATION

BARBER, N. J.

CHICAGO MADISON, ILL. NEW YORK

TRINIDAD NATIVE LAKE ASPHALT

IS

The Vital Element in *Trinidad Lake* ROOFING ASPHALT

Trinidad Native Lake Asphalt . . . Nature's Own Waterproofing Material . . . is Recognized the World Over.

Trinidad Native Lake Asphalt is a waterproofing material which has given long and satisfactory service when exposed directly to the elements. Is is recognized the world over for its weather resistance, wearing and waterproofing qualities. It is Nature's own waterproofing material.

IMPARTIAL

Tests

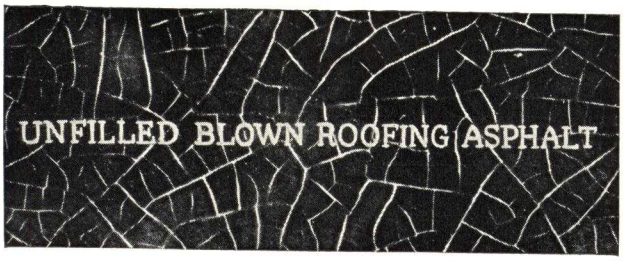
PROVE THE OUTSTANDING QUALITIES AND ADVANTAGES OF ROOFS USING TRINIDAD LAKE ROOFING ASPHALT

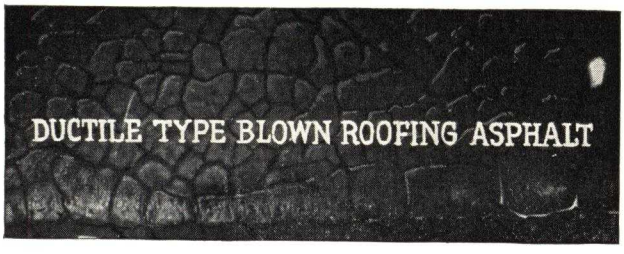
TRINIDAD LAKE ROOFING ASPHALT

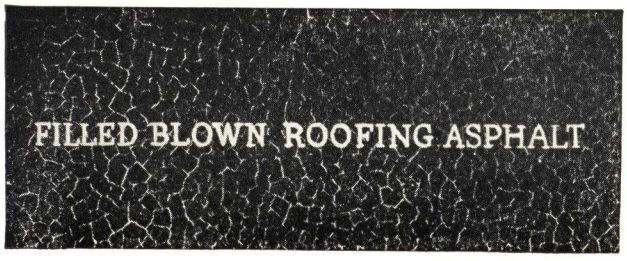
Four Types of Built-Up Roofing Asphalts Were Recently Subjected to Severe Tests in the Weather-Ometer

SUCH TESTS ARE WHOLLY IMPARTIAL

The Weather-Ometer is a mechanical device which makes possible accelerated weathering tests on coating films, or, in other words, hastens the destruction of such coating films by an exaggeration of natural weather conditions. When films of asphalt are subjected to the Weather-Ometer test they take more punishment in a few months than they would ordinarily receive on a roof during a period equivalent to at least ten years' outdoor exposure.







Recently the four types of asphalt generally used for built-up roofing purposes were subjected to the impartial Weather-Ometer tests. The illustration above shows how Trinidad Lake Roofing Asphalt came through the test—without a sign of failure after the equivalent of at least ten years of ordinary weather exposure. The three illustrations at the left show how the other types of asphalt checked or cracked or failed in a comparatively short time.

EVERY PRACTICAL WEATHER CONDITION

In these tests, continuous films of the four types of asphalt were applied on aluminum panels and placed in the Weather-Ometer. They were then exposed to a devastating cycle of frigid cold, soaking "rain" and scorching "sunlight."

Failure in the Weather-Ometer is judged to take place when the asphalt film on the aluminum panel breaks down so that cracks or fissures in the asphalt extend to the panel. This is determined by an ingenious electrical device which transmits the current when the asphalt fails, indicating a break in the film.

BONDS

Barber Genasco Trinidad Lake Asphalt Built-up Roofings will be bonded by a nationally known bonding company which guarantees against maintenance expense for 10, 15 or 20 years, depending upon the type of roofing applied.

BARBER *Genasco* TRINIDAD LAKE ASPHALT BUILT-UP ROOFINGS

Designation	Type of deck	Limitation of pitch, inches	Surface finish	Composition: Layers of felt	Composition: Number mopping of asphalt	Weight of Materials, lbs.: Weight of felts	Trinidad Lake roofing asphalt	Barber Genasco primer	Gravel surfacing	Slag surfacing	Total weight per square applied, lbs.: Smooth surfaced	Gravel surfacing	Slag surfacing	Underwriters' laboratories rating	Specification number
All Rag Felts—Asphalt Saturated															
10 year Bonded roof	Wood	¼–6	Smooth	1-30 lb. felt (base) 2-15 lb. felts	3	62	90	....	....	....	152	....	....	C	R-10-B
	Concrete *	¼–6	Smooth	3-15 lb. felts	4	45	120	10	....	....	175	....	....	C	R-10-C
15 year Bonded roof	Wood	¼–3	Gravel or slag	1-30 lb. felt (base) 2-15 lb. felts	3	62	110	....	400	300	....	572	472	A	R-15-BG
	Concrete *	¼–3	Gravel or slag	3-15 lb. felts	4	45	140	10	400	300	....	595	495	A	R-15-CG
20 year Bonded roof	Wood	¼–3	Gravel or slag	1-30 lb. felt (base) 3-15 lb. felts	4	77	140	....	400	300	....	617	517	A	R-20-BG
	Concrete *	¼–3	Gravel or slag	4-15 lb. felts	5	60	170	10	400	300	....	640	540	A	R-20-CG
10 year Wide-Selvage roof	Wood	3–9	Mineral Granules	2-15 lb. felts 2-Wide Selvage	3	140	90	....	....	....	....	230[2]	....	C	R-WS-10-B
	Concrete	3–9	Mineral Granules	1-15 lb. felt 2-Wide Selvage	3	125	90	10	....	....	....	225[2]	....	C	R-WS-10-C
10 year Spray Deck roof	Wood	½–2	Smooth	1-45 lb. felt (base) 1-Sat. Fabric 2-15 lb. felts	4 & 1[3]	75 & 8[4]	120 & 73[3]	....	....	....	276	....	....	....	R-SD-10-B
	Concrete	½–2	Smooth	2-15 lb. felts 1-Sat. Fabric 2-15 lb. felts	6 & 1[3]	60 & 8[4]	180 & 73[3]	10	....	....	331	....	....	....	R-SD-10-C
10 year Prom. Tile	Concrete	¼–½	Tile	3-15 lb. felts	4 & 1[3]	45	120 & 73[3]	10	....	....	1198[5]	....	....	....	R-PT-10-C
20 year Prom. Tile	Concrete	¼–½	Tile	4-15 lb. felts	5 & 1[3]	60	150 & 73[3]	10	....	....	1243[5]	....	....	....	R-PT-20-C
Standard Trinidad roof	Wood	¼–6	Smooth	1-30 lb. felt (base) 2-15 lb. felts	3	62	90	....	....	....	152	....	....	C	S-R-B
	Concrete *	¼–6	Smooth	3-15 lb. felts	4	45	120	10	....	....	175	....	....	C	S-R-C
Economy Trinidad roof	Wood	¼–6	Smooth	1-30 lb. felt (base) 1-15 lb. felt	2	47	60	....	....	....	107	....	....	C	E-R-B
	Concrete	¼–6	Smooth	1-30 lb. felt (base) 1-15 lb. felt	3	47	90	10	....	....	147	....	....	C	E-R-C
Asbestos Felts—Asphalt Saturated															
10 year Bonded asbestos roof	Wood	¼–6	Smooth	1-35 lb. asb. felt (base) 2-20 lb. asb. felts	3	75	90	....	....	....	165	....	....	A	A-10-B
	Concrete *	¼–6	Smooth	1-35 lb. asb. felt (base) 2-20 lb. asb. felts	4	75	120	10	....	....	205	....	....	A	A-10-C
10 year Comb. asbestos roof	Wood	¼–6	Smooth	1-30 lb. rag felt (base) 2-20 lb. asb. felts	3	72	90	....	....	....	162	....	....	....	AR-10-B
	Concrete *	¼–6	Smooth	1-30 lb. rag felt (base) 2-20 lb. asb. felts	4	72	120	10	....	....	202	....	....	A	AR-10-C
15 year Bonded asbestos roof	Wood	¼–6	Smooth	1-60 lb. asb. base sheet 2-20 lb. asb. felts	3	100	90	....	....	....	190	....	....	A	A-15-B
	Concrete	¼–6	Smooth	1-60 lb. asb. base sheet 2-15 lb. asb. felts	4	90	120	10	....	....	220	....	....	A	A-15-C
	Insulation *	¼–6	Smooth	3-20 lb. asb. felts	4	60	120	....	....	....	180	....	....	A	A-15-I
15 year Comb. asbestos roof	Wood	¼–6	Smooth	1-45 lb. base sheet 2-20 lb. asb. felts	3	85	90	....	....	....	175	....	....	....	AR-15-B
	Concrete	¼–6	Smooth	2-15 lb. rag felts 2-20 lb. asb. felts	5	70	150	10	....	....	230	....	....	A	AR-15-C
20 year Bonded asbestos roof	Wood	¼–6	Smooth	1-60 lb. asb. base sheet 3-20 lb. asb. felts	4	120	120	....	....	....	240	....	....	A	A-20-B
	Concrete	¼–6	Smooth	1-60 lb. asb. base sheet 2-20 lb. asb. felts	4	100	120	10	....	....	230	....	....	A	A-20-C
	Insulation *	¼–6	Smooth	4-20 lb. asb. felts	5	80	150	....	....	....	230	....	....	A	A-20-I
20 year Comb. asbestos roof	Wood	¼–6	Smooth	1-45 lb. base sheet 3-20 lb. asb. felts	4	105	120	....	....	....	225	....	....	....	AR-20-B
	Concrete	¼–6	Smooth	2-15 lb. rag felts 3-20 lb. asb. felts	6	90	180	10	....	....	280	....	....	A	AR-20-C

Note: Special specifications for unusual conditions are available on request.
2. Mineral Granules. 3. Plastic Cement. 4. Saturated Fabric. 5. Including 950 lbs. tile. *Used for Steel Decks—Gypsum—Insulation.

CONDENSED SPECIFICATIONS BARBER *Genasco* TRINIDAD LAKE ASPHALT BUILT-UP ROOFINGS

All-Rag Felts, Asphalt Saturated

R-10-B *Smooth Surface* 10 YEAR BONDED

For Use Over Wood (or precast gypsum) on Inclines from ¼" to 6" per ft. Underwriters' Classification "C"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing R-10-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer of Barber Genasco All-Rag Extra-Heavy Felt lapped 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply two layers of Barber Genasco All-Rag Standard Felt lapping each sheet 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

R-10-C *Smooth Surface* 10 YEAR BONDED

For Use Over Concrete Gypsum or Tile on Inclines from ¼" to 6" per ft. Underwriters' Classification "C"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing R-10-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gal. per square; mop on 30 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 3 layers of Barber Genasco All-Rag Standard Felt, lapping each sheet 22". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

R-15-BG *Gravel or Slag Surface* 15 YEAR BONDED

For Use Over Wood (or precast gypsum) on Inclines from ¼" to 3" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing R-15-BG applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer of Barber Genasco All-Rag Extra Heavy Felt, lap 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply two layers of Barber Genasco All-Rag Standard Felt lapping each sheet 17". All felts to be thoroughly cemented together with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square. Over the felts thus laid pour 50 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and embed therein, while hot, 400 lbs. of Gravel or 300 lbs. of slag per square.

FLASHING—Barber Genasco 15 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 15 years.

R-15-CG *Gravel or Slag Surface* 15 YEAR BONDED

For Use Over Concrete Gypsum or Tile on Inclines from ¼" to 3" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing R-15-CG applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gal. per square; mop on 30 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 3 layers Barber Genasco All-Rag Standard Felt, lapping each sheet 22". All felts to be thoroughly cemented together with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square. Over the felts thus laid pour 50 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and embed therein, while hot, 400 lbs. of Gravel or 300 lbs. slag per square.

FLASHING—Barber Genasco 15 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 15 years.

R-20-BG *Gravel or Slag Surface* 20 YEAR BONDED

For Use Over Wood (or precast gypsum) on Inclines from ¼" to 3" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing R-20-BG applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer of Barber Genasco All-Rag Extra Heavy felt lapped 2"; mop down 30 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 3 layers Barber Genasco All-Rag Standard Felt lapped 22". All felts to be thoroughly cemented together with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square. Over the felts thus laid pour 50 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and embed therein, while hot, 400 lbs. of Gravel or 300 lbs. slag per square.

FLASHING—Barber Genasco 20 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 20 years.

R-20-CG *Gravel or Slag Surface* 20 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines from ¼" to 3" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing R-20-CG applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gal. per square; mop on 30 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 4 layers Barber Genasco All-Rag Standard Felt, lapping each sheet 24½". All felts to be thoroughly cemented together with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square. Over the felts thus laid pour 50 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and embed therein, while hot, 400 lbs. of Gravel or 300 lbs. of slag per square.

FLASHING—Barber Genasco 20 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 20 years.

R-WS-10-B *Mineral Surface* 10 YEAR BONDED

For Use Over Wood or Precast Gypsum on Inclines Exceeding 3" per ft. Underwriters' Classification "C"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Wide Selvage Built-up Roofing R-WS-10-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply 2 layers of Barber Genasco All-Rag Standard Felt, lapping each sheet 17"; mop on 30 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 1 layer Barber Genasco Wide Selvage Construction Mineral Surfaced Roofing lapped the full width of the selvage. All felts to be thoroughly cemented together with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

R-WS-10-C *Mineral Surface* 10 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines Exceeding 3" per ft. Underwriters' Classification "C"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Wide Selvage Built-up Roofing R-WS-10-C ap-

plied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gal. per square; mop on 30 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 1 layer Barber Genasco All-Rag Standard Felt lapped 6″; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply one layer Barber Genasco Wide Selvage Construction Mineral Surfaced Roofing lapped the full width of the selvage. All felts to be thoroughly cemented together with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

Note: Unless the roof deck permits of nailing, creosoted nailing strips must be provided 3′ apart and parallel with roof slope.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

R-PT-10-C *Promenade Tile* 10 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines ½″ per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing R-PT-10-C complete with promenade tile applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime the roof deck with Barber Genasco Concrete Primer, using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 3 layers of Barber Genasco All-Rag Standard Felt, lapping each sheet 22″. All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

Spread on a layer of Barber Genasco Plastic Cement uniformly ⅛″ thick; embed tiles with ⅜″ wide joints filled with Plastic and wipe off all surplus cement.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

R-PT-20-C *Promenade Tile* 20 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines ½″ per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing R-PT-20-C complete with promenade tile applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime the roof deck with Barber Genasco Concrete Primer, using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 4 layers of Barber Genasco All-Rag Standard Felt lapping each sheet 24½″. All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

Spread on a layer of Barber Genasco Plastic Cement uniformly ⅛″ thick; embed tiles with ⅜″ wide joints filled with Plastic and wipe off all surplus cement.

FLASHING—Barber Genasco 20 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 20 years.

R-SD-10-B *Spray Deck* 10 YEAR BONDED

For Use Over Wood or Precast Gypsum on Inclines from ¼″ to 3″ per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing for Spray Deck R-SD-10-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply 1 layer Barber Genasco No. 45 Base Sheet lapped 2″; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 1 layer Barber Genasco Waterproofing Fabric No. 4 lapped 3″; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 2 layers of Barber Genasco All-Rag Standard Felt lapping each sheet 17″. All felts and fabrics shall be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square. Trowel 1 uniform layer of Genasco Plastic Cement ⅛″ thick over top mopping after roof is otherwise complete.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

R-SD-10-C *Spray Deck* 10 YEAR BONDED

For Use Over Concrete Gypsum or Tile on Inclines from ¼″ to 3″ per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing R-SD-10-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer, using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 2 layers Barber Genasco All-Rag Standard Felt, lapping each sheet 17″; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 1 layer Barber Genasco Waterproofing Fabric No. 4 lapped 3″; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 2 layers Barber Genasco All-Rag Standard Felt, lapping each sheet 17″. All felts and all fabrics shall be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square. Trowel 1 uniform layer of Barber Genasco Plastic Cement ⅛″ thick over top mopping after roof is otherwise complete.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

SR-B *Smooth Surface* STANDARD

For Use Over Wood (or precast gypsum) on Inclines from ½″ to 3″ per ft.

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing SR-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer of Barber Genasco All-Rag Extra-Heavy Felt lapped 2″; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply two layers of Barber Genasco All-Rag Standard Felt lapping each sheet 17″. All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

SR-C *Smooth Surface* STANDARD

For Use Over Concrete, Gypsum or Tile on Inclines from ½″ to 3″ per ft.

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing SR-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 3 layers Barber Genasco All-Rag Standard Felt, lapping each sheet 22″. All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

ER-B *Smooth Surface* ECONOMY

For Use Over Wood (or precast gypsum) on Inclines from ½″ to 3″ per ft.

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing ER-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer Barber Genasco All-Rag Extra-Heavy Felt lapped 2″ ; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply one layer Barber Genasco All-Rag Standard Felt lapped 2″. All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

ER-C *Smooth Surface* ECONOMY

For Use Over Concrete, Gypsum or Tile on Inclines from ½″ to 3″ per ft.

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing ER-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply one layer Barber Genasco All-Rag Extra-Heavy Felt lapped 2″; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply one layer Barber Genasco All-Rag Standard Felt lapped 2″. All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

BARBER Genasco Asbestos Felts, Asphalt Saturated

A-10-B *Smooth Surface* 10 YEAR BONDED

For Use Over Wood (or precast gypsum) on Inclines from ¼" to 6" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Asbestos Built-up Roofing A-10-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer of Barber Genasco 35 lb. Asbestos Felt lapped 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 2 layers of Barber Genasco 20 lbs. Asbestos Felt lapped 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

A-10-C *Smooth Surface* 10 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines from ¼" to 6" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Asbestos Built-up Roofing A-10-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt; apply one layer Barber Genasco 35 lb. Asbestos Felt lapped 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 2 layers of Barber Genasco 20 lb. Asbestos Felt lapping each sheet 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

AR-10-B *Smooth Surface* 10 YEAR BONDED

For Use Over Wood (or precast gypsum) on Inclines from ¼" to 6" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Combination Built-up Roofing AR-10-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer Barber Genasco All-Rag Extra-Heavy Felt lapped 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt; apply 2 layers Barber Genasco 20 lb. Asbestos Felt lapping each sheet 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

AR-10-C *Smooth Surface* 10 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines from ¼" to 6" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Combination Built-up Roofing AR-10-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply one layer Barber Genasco All-Rag Extra-Heavy Felt lapped 2"; mop on 30 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 2 layers of Barber Genasco 20 lb. Asbestos Felt lapping each sheet 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 10 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 10 years.

A-15-B *Smooth Surface* 15 YEAR BONDED

For Use Over Wood (or precast gypsum) on Inclines from ¼" to 6" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Asbestos Built-up Roofing A-15-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer Barber Genasco Asbestos Base Sheet lapping 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 2 layers of Barber Genasco 20 lb. Asbestos Felt lapping each sheet 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 15 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 15 years.

A-15-C *Smooth Surface* 15 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines from ¼" to 6" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing A-15-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply one layer Barber Genasco 60 lb. Asbestos Base Sheet lapped 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt; and apply 2 layers of Barber Genasco 15 lb. Asbestos Felt lapping each sheet 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 15 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 15 years.

AR-15-B *Smooth Surface* 15 YEAR BONDED

For Use Over Wood (or precast gypsum) on Inclines from ¼" to 3" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing AR-15-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation

Apply one layer Barber Genasco 45 lb. Base Sheet lapped 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; and apply 2 layers Barber Genasco 20 lb. Asbestos Felt lapping each sheet 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 15 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 15 years.

AR-15-C *Smooth Surface* 15 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines from ¼" to 6" per ft.

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing AR-15-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 2 layers Barber Genasco All-Rag Standard Felt lapping each sheet 17"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt and apply 2 layers Barber Genasco 20 lb. Asbestos Felt, lapping each sheet 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 15 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 15 years.

A-15-I — *Smooth Surface* — 15 YEAR BONDED

For Use Over Approved Insulation on Inclines from ¼" to 6" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing A-15-I applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Mop surface of Insulation with 30 lbs. of Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 3 layers Barber Genasco 20 lb. Asbestos Felt lapping each sheet 22". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 15 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 15 years.

A-20-B — *Smooth Surface* — 20 YEAR BONDED

For Use Over Wood (or precast gypsum) on Inclines from ¼" to 3" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing A-20-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer of Barber Genasco 60 lb. Asbestos base sheet lapped 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 3 layers Barber Genasco 20 lb. Asbestos Felt lapping each sheet 22" and mopping the full width of the lap. All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 20 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 20 years.

A-20-C — *Smooth Surface* — 20 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines from ¼" to 3" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing A-20-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gal. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply one layer Barber Genasco 60 lb. Asbestos base sheet lapping 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 2 layers Barber Genasco 20 lb. Asbestos Felt lapping each sheet 17". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 20 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 20 years.

AR-20-B — *Smooth Surface* — 20 YEAR BONDED

For Use Over Wood (or precast gypsum) on Inclines from ¼" to 3" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing AR-20-B applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Apply one layer Barber Genasco 45 lb. Base Sheet lapping 2"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 3 layers of Barber Genasco 20 lb. Asbestos Felt lapping each sheet 22". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 20 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 20 years.

AR-20-C — *Smooth Surface* — 20 YEAR BONDED

For Use Over Concrete, Gypsum or Tile on Inclines from ¼" to 3" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing AR-20-C applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Prime roof deck with Barber Genasco Concrete Primer using 1¼ gals. per square; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square; apply 2 layers Barber Genasco All-Rag Standard Felt lapping each sheet 17"; mop on 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 3 layers Barber Genasco 20 lb. Asbestos Felt lapping each sheet 22". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 20 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 20 years.

A-20-I — *Smooth Surface* — 20 YEAR BONDED

For Use Over Approved Insulation on Inclines from ¼" to 6" per ft. Underwriters' Classification "A"

INSERT UNDER ROOFING—Built-up roofing shall be Barber Genasco Trinidad Lake Asphalt Built-up Roofing A-20-I applied as follows and in strict accordance with the detailed specifications of Barber Asphalt Corporation.

Mop surface of Insulation with 30 lbs. Barber Genasco Trinidad Lake Roofing Asphalt per square and apply 4 layers of Barber Genasco 20 lb. Asbestos Felt lapping each sheet 24½". All felts to be thoroughly cemented together and protected with Barber Genasco Trinidad Lake Roofing Asphalt applied at the rate of 30 lbs. per mopping per square.

FLASHING—Barber Genasco 20 Year Bonded Flashing shall be used.

BOND—Manufacturer's bond on roofing and/or flashing shall be furnished for a period of 20 years.

INSULATION

Over Boards—After nailing or securely fastening the insulating materials to the board deck in the manner prescribed by the manufacturers thereof mop surface of insulation and apply roofing as prescribed for application over concrete, eliminating Primer.

Non-Combustible Decks—The specification for application over concrete shall be followed—priming roof deck and mopping with asphalt, into which while hot embed insulating materials in manner prescribed by manufacturers thereof. Joints shall not be wider than $\frac{3}{16}$ of an inch.

Mop surface of insulating material thoroughly and apply roofing as prescribed for application over concrete, eliminating Primer.

Where slope exceeds one inch to the foot, insulation shall be secured to nailing strips or other suitable devices provided in decks incapable of receiving nails.

For Conditions of High Humidity Within Building Arising from Industrial Businesses

Apply a layer of Barber Genasco All-Rag Standard Felt, lapped 6" and mop the full width of the lap with hot asphalt. This felt shall be nailed sufficiently to hold in place to board decks or thoroughly cemented with hot asphalt to non-combustible roof decks.

Mop the felt thus laid with hot asphalt, into which embed insulation. Where slope exceeds one inch to the foot, insulation shall be secured to nailing strips or other suitable devices provided in decks incapable of receiving nails.

Insulation shall be isolated into areas approximately 25 feet square, and water cut-offs provided consisting of a continuous layer of felt sufficiently wide to extend 4" over top edge of insulation in place, down and 4" under edge of adjoining insulation. Similar cut-offs extending 4" under and up and 4" over top of insulation shall be installed at all edges of insulation adjoining upward projections from roof.

All felts composing cut-offs shall be thoroughly cemented to underlying surfaces with hot asphalt.

After insulation is complete, mop the surface thereof and apply roofing as prescribed for application over concrete, eliminating Primer.

Note:—Where more than one layer of insulation is used each successive layer shall be mopped solidly with hot asphalt to preceding layer and nailed in addition thereto with nails one inch longer than total thickness of insulation where the slope exceeds one inch to the foot.

Note:—No more insulation shall be laid than can be completely covered the same day. Roofing felts shall be turned down over the edge of insulation at the end of each day and completely sealed with hot asphalt to keep out dampness.

Wet insulation is of little or no value and is almost certain to cause trouble and expense, and Barber Asphalt Corporation may at its option refuse to bond Barber Genasco Trinidad Bonded Roofing applied over wet or defective insulation.

All decks shall be thoroughly dry prior to the application of insulation, otherwise Barber Asphalt Corporation may at its option require a layer of felt applied as prescribed under humid conditions.

BARBER Genasco

ASPHALT FLOORINGS

BARBER GENASCO ASPHALT MASTIC

. . . For Hot Application

A bituminous mixture of Trinidad Native Lake Asphalt, Flux, and properly graded mineral aggregate. When hot it is sufficiently plastic to spread with a wooden trowel or float, in one continuous sheet. It hardens as it cools and is ready for use 2 or 3 hours after being laid.

Advantages—(1) Will withstand heavy trucking—is resilient and therefore less tiring to employees who must stand at their work. (2) Sanitary, odorless, non-dusting, non-absorbent and non-glaring, and is waterproof. (3) Not only recommended for new construction but can be laid over old floors of any material.

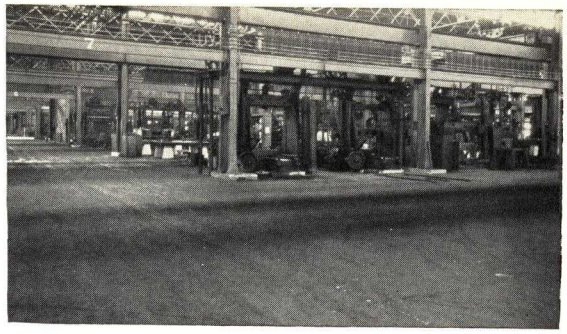
Available Specifications—Indoor and Outdoor foot and light traffic; indoor and outdoor heavy trucking and traffic; cold storage (over foundation of wood, cork, concrete, or other firm and stable base); plating rooms; acid tank rooms; and floors subjected to acid liquors.

EMULMASTIC . . . *For Cold Application*

Emulmastic is resilient, comparatively noiseless, easy under foot and cushions the shocks of heavy trucking. Will not soften or melt in summer heat, or crack due to cold weather. Provides a non-skid surface. It is odorless, therefore suitable for use in cold storage rooms. It is verminproof and relatively dustless.

Recommended for patching or resurfacing floors and decks and for leveling old floors prior to application of linoleum, tile or wood blocks. No special skill is required to patch or resurface with Emulmastic and no special equipment is necessary.

Advantages—For light foot traffic, Emulmastic is ready for use within 24 hours. For unusually heavy loads, a longer period is required. Generally speaking, floors may be resurfaced on Saturday and a new, smooth surface will be ready for use on Monday.



Guide Bearer Shop, Baldwin Locomotive Works, Eddystone, Pa., Floored with Barber Genasco Trinidad Lake Asphalt Mastic

BARBER Genasco MEMBRANE WATERPROOFING

Waterproofing a Vital Necessity—For the life and stability of foundations of buildings, tunnels, subways or other forms of sub-construction, reservoirs, bridges, retaining walls, basements, etc.

Suitable for Exacting Conditions—Barber Genasco membrane Waterproofing consists of plies of Barber Genasco Waterproofing Fabric mopped with hot Barber Genasco Waterproofing Asphalt.

Comply with A. S. T. M. Specifications — Barber Genasco Waterproofing Asphalts are furnished in various consistencies suitable for use above and below ground. They comply with specifications of the American Society for Testing Materials and many other specifications. Through years of successful use, they have withstood the most severe service conditions.

Resists Hydrostatic Pressure — Barber Genasco Membrane Waterproofing is most successful in waterproofing structures exposed to hydrostatic pressure or conditions of continual dampness or moisture, particularly in below-ground work.

Technical Service—If you have a waterproofing problem, our Technical Department will be glad to work with you and to recommend specifications to meet your particular needs.

BARBER Genasco DAMPPROOFING

. . . For All Brick or Concrete Foundations Where Back-Fill Will be Used

All surfaces shall be brushed free of dirt or foreign materials and all cracks, voids or open joints in masonry shall be properly pointed up with Portland Cement mortar.

For Hot Application—*First*—Apply Barber Genasco Concrete Primer over the entire surface to be dampproofed, using not less than 1¼ gals. per 100 sq. ft.

Second—Over the surface thus primed mop down a uniform coating of Barber Genasco Waterproofing Asphalt, using not less than 40 lbs. per 100 sq. ft.

Third—The back-fill shall then be solidly tamped in place, care being taken not to puncture the asphalt film thus applied.

For Cold Application—*Alternate No. 1—Barber Genasco Liquid* Asphalt "S" applied at the rate of 2 gals. per 100 sq. ft. over the previously primed surface can be substituted for hot asphalt where a cold application is desired. Delay backfilling until Liquid Asphalt "S" has set.

Alternate No. 2—On Surfaces Which Are Damp—Suitable for use from May to October.

All surfaces to be dampproofed shall be uniformly coated with a priming solution, using 2 gals. to each 100 sq. ft. of surface. Priming solution shall consist of one volume of clean, soft water to three volumes of Barber Emulsified Asphalt 600, which shall be stirred vigorously during the addition until it is uniform. The prime coat should be allowed to dry for about 15 minutes or longer, depending upon atmospheric conditions, so that when the coating is pressed with the thumb, it will not be pulled loose when thumb is taken away.

Apply Barber Emulsified Asphalt 600 over entire previously primed surface, using not less than 2 gals. per 100 sq. ft. After the emulsion has become thoroughly set, the back-fill can be tamped into place. Extreme care must be used in placing back-fill to prevent abrasion of the film of asphalt, otherwise the efficiency of the dampproofing will be seriously impaired.

BARBER Genasco LATYLE

. . . For Setting Ceramic Mosaic, Pavers, Quarry and Similar Floor Tile

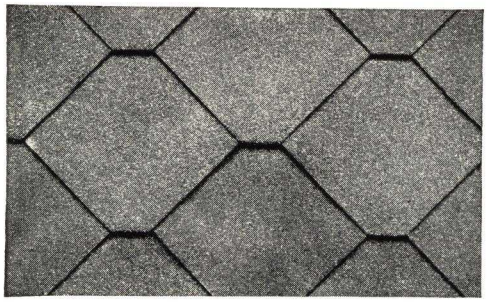
Barber Latyle is an entirely new product for the installation of tile on thin setting mortar beds, and is usually applied $\frac{3}{16}$" thick instead of 1¼" or more as required with other materials used for this purpose. It is recommended for new or old construction.

Advantages—Latyle provides a greater bond, with greater flexibility, resulting in fewer broken tile and less cracking. Applied over existing floors and generally without materially changing floor line. Less noise and easier walking on tile set in Latyle.

Worn out and cracked concrete, terrazzo or masonry floors covered with tile set in Latyle at little expense. Simply remove loose or broken areas—no cutting of sound material. Latyle functions both as leveling course and setting bed. Cost of patching existing tile floors with Latyle negligible as compared with present practice.

Condensed Specifications—(Tile Industry Research Bureau Specification R-TS-51)—"Furnish all materials and labor necessary for the completion of the tile work. The specification for Installation of Tile in Latyle Setting Bed, 1937, as issued by Barber Asphalt Corporation, insofar as any portion is applicable to this building, is hereby made a part of this specification and of the contract."

BARBER *Genasco* SHINGLES & SIDINGS



Barber Genasco Latite Shingles

Barber Genasco Sealbac Individual Shingles

Barber Genasco Sta-Rite Shingles

Barber Genasco Barb-Lock Shingles

• • • Only Barber Genasco Shingles and Sidings Contain *The Vital Element*

BARBER GENASCO LATITE SHINGLES

These are square except for a turned under corner and lay up to a hexagonal form. A patented metal band or "Key" at the butt locks each shingle to the adjoining ones so that they lay tight and stay tight. Furnished in two sizes: 16x16 in., approximate average weight 126 lbs. per square; 14x14 in., approximate average weight 150 lbs. per square. Furnished in many beautiful colors and blends.

BARBER GENASCO SEALBAC INDIVIDUAL SHINGLES

Furnished in two sizes: Standard Weight, 9x12¾ in., approximate average weight 257 lbs. per square. Extra-Heavy, 12x16 in., approximate average weight 327 lbs. per square.

Furnished in many beautiful colors and blends.

BARBER GENASCO STA-RITE SHINGLES

A new individual shingle that lays up to a hexagonal form on the roof. This modern shingle is not only secured to the roof by concealed nails, but is sealed to the lower course of shingles with Barber Genasco Plastic Cement just as you would seal the flap of an envelope.

Size: 16x16 in., approximate average weight 126 lbs. per square. Furnished in many beautiful colors and blends.

BARBER GENASCO BARB-LOCK SHINGLES

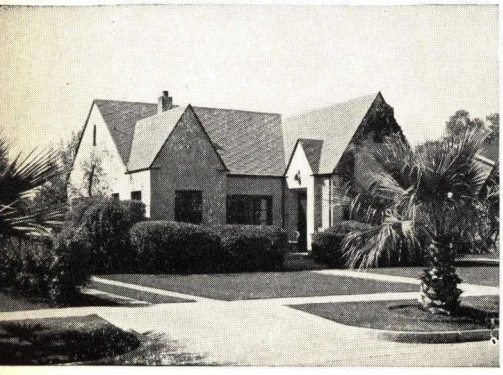
The new Barb-Lock Asphalt Shingle with its accentuated shadow lines gives a symmetrical, thatched effect . . . has a successful locking device . . . and its diagonal drip edge provides assurance of complete drainage and additional weather protection.

Barber Genasco Barb-Lock Shingles measure 13x17 in.; approximate average weight 135 lbs. per square. Furnished in many attractive colors and blends.

BARBER GENASCO MAS-TAB SHINGLES

Furnished in two types: Barber Genasco Mas-Tab Doubl-Dipped Strip Shingles which has an extra coating of asphalt and mineral granules applied by hand to the butts and Barber Genasco Mas-Tab (Overlay Process) Strip Shingles which have an extra coating of asphalt and mineral granules applied mechanically to the surface

Barber Genasco Latite Shingles used on roof of this attractive residence, Phoenix, Arizona



Barber Genasco Sta-Rite Shingles were used to roof this Birmingham, Ala., residence

Barber Genasco Barb-Lock Shingles on Roof of this home in Winchester, Mass.

Barber Genasco Individual Shingles Used to Re-roof This Residence at Atlanta, Ga.

Residence at Nashville, Tenn., Roofed with Barber Genasco Mas-Tab Double-Dipped Strip Shingles

Barber Genasco Hexagon Strip Shingles Brick-Like Siding Used to Roof This Attractive Atlanta, Ga., Home

of the butts. These shingles are furnished in many beautiful colors and blends and in the following weights:

Barber Genasco Mas-Tab Doubl-Dipped Strip Shingles measuring 12 x 36 in. and weighing 230 lbs. per square.

Barber Genasco Mas-Tab (Overlay Process) Strip Shingles measuring 12 x 36 in. and weighing 210 lbs. per square.

Barber Genasco Mas-Tab (Overlay Process) Strip Shingles measuring 15 x 36 in. and weighing 254 lbs. per square.

BARBER GENASCO BRICK-LIKE SIDING

Furnished in two types: Barber Genasco Doubl-Dip Tru-Brick Siding and Barber Genasco Brick-Like (Overlay Process) Siding, which is furnished in two weights. Both types resemble real face brick and are used for re-siding old, weather-battered clapboard or wood shingle side walls. All three measure 7x36 in. and have four Tabs or "Bricks" to strip—2½ in. of "Brick" and ½ in. of "mortar." Furnished in beautiful colors and blends with contrasting "mortar joints."

Barber Genasco Doubl-Dip Tru-Brick Siding, approximate average weight 230 lbs. per square.

Barber Genasco Brick-Like (Overlay Process) Siding, *made with coarse granules*, approximate average weight 210 lbs. per square.

Barber Genasco Brick-Like (Overlay Process) Siding *made with fine granules*, approximate average weight 160 lbs. per square.

BARBER GENASCO SEALBAC STRIP SHINGLES

Furnished in the following sizes and weights: 10x36 in., approximate average weight 210 lbs. per square; 12½x36 in., approximate weight 266 lbs. per square; 12x36 in. (Extra Heavy) approximate average weight 257 lbs. per square.

Barber Genasco Sealbac Strip Shingles are furnished in many beautiful colors and blends.

BARBER GENASCO HEXAGON STRIP SHINGLES

Furnished in the following sizes:

Barber Genasco 11⅓x36 in. Hexagon Strip Shingles. Approximate average weight 167 lbs. per square. Furnished in many beautiful colors and blends.

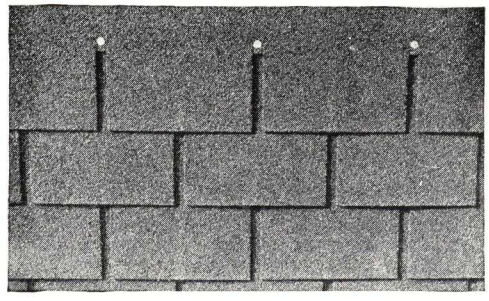
Barber Genasco 12⅓x36 in. Hexagon Strip Shingles. Approximate average weight 185 lbs. per square. Furnished in many beautiful colors and blends.

Barber Genasco 12½x36 in. Hexagon Strip Shingles. Approximate average weight 226 lbs. per square. Furnished in many beautiful colors and blends.

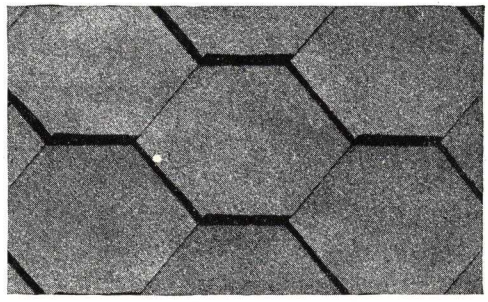
Barber Genasco Trinitab 11⅓x36 in. Hexagon Strip Shingles. Approximate average weight 167 lbs. per square.

Barber Genasco Mas-Tab Strip Shingles

Barber Genasco Brick-Like Siding



Barber Genasco Sealbac Strip Shingles



Barber Genasco Hexagon Strip Shingles

Barber Asphalt Corporation

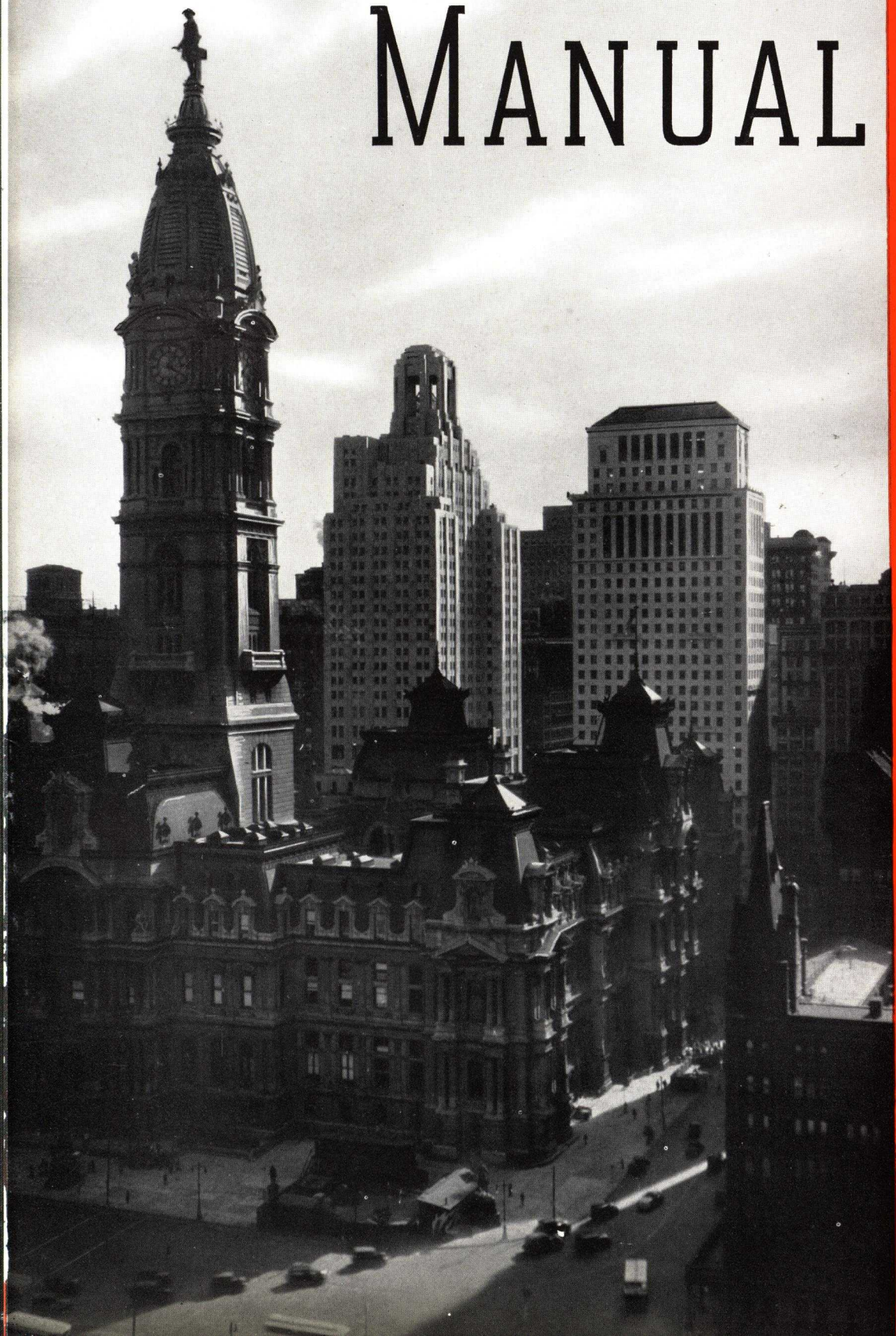
BARBER, N.J.

NEW YORK

MADISON, ILL.

CHICAGO

REFERENCE MANUAL



Barrett

for Architects and Engineers

BUILT-UP ROOFING

FLASHING

ROOF DRAINAGE

WATERPROOFING

DAMPPROOFING

INDEX

SECTION 1—BUILT-UP ROOFING

Page

Flat Roof Specifications 9

Wood Decks 20 Year—Type "AA" . . . 10
" " 15 " " "A" 10
Poured Concrete or Gypsum 20 " " "AA" . . . 11
" " " " 15 " " "A" 11
Precast Concrete Slabs 20 " " "AA" . . . 12
" " " 15 " " "A" 12
Precast Gypsum Slabs 20 " " "AA" . . . 13
" " " 15 " " "A" 13
Insulated Steel Decks 20 " " "AA" . . . 14
" " " 15 " " "A" 14
Concrete, under Promenade Tile, 5-ply 15
Utility or Spray Pond Service 16
Under Bituminous Traffic Top 17
Rigid Insulation Application and Waterproofing 18

SECTION 2—BUILT-UP ROOFING

Steep Roof Specifications 19

Wood Decks 20 Year—Slag Surfaced . . 20
" " 10 " —S. I. S. 21
Poured Concrete or Gypsum 20 " —Slag Surfaced . . 22
" " " " 10 " —S. I. S. 23
Precast Gypsum or Concrete Slabs 20 " —Slag Surfaced . . 24
Precast Gypsum or Concrete Slabs 10 " —S. I. S. 25
Incline Table 26

SECTION 3—FLASHINGS

Roof and Spandrel Flashing Specifications . 27

Method of Installing Barrett Flashing Block (For Brick Walls) 28
" " " " Flashing Form (For Concrete Walls) 29
Type "AA" 20 Year; Type "A" 15 Year (For Brick Walls) 30
Type "AA" 20 Year; Type "A" 15 Year (For Concrete Masonry) 31
Alternate Type "AA" Flashing Using Bituminous Base and Metal Counter Flashings . . 32
Plastic Elastigum Type, 10 Year Guaranty (Brick or Concrete) 33
Method of Installing Metal Cap and Base Flashing . . . 34
" " " Flashing for Promenade Tile Roofs . . 35
Parapet Walls and Spandrel Beams 36
Flat and Steep Roof Construction—Method of Finishing Eaves and Edges 37
Sign Supports, Stacks, Stub Columns, Etc. 38

SECTION 4—DRAINAGE

Roof Drainage System Specifications . . . 39

Illustrations—Barrett-Holt Leader and Vent Connections . . 40

SECTION 4—DRAINAGE (Continued)

Page

Method of Installing Barrett-Holt Leader Connections:

Type 1-LG, for gravel or slag surfaced roofs 41
" 1-LS, for smooth surfaced roofs 41
" 1-LM, for metal roofs and gutters 41
" 2-LG, for steep gravel or slag surfaced roofs . . . 42
" 2-LS, for steep smooth surfaced roofs 42
" 5-LG, (sump type) for gravel or slag roofs 43
" 5-LS, (sump type) for smooth surfaced roofs . . . 43
" 5-LM, (sump type) for metal roofs and gutters . . 43
" 6-LG, for gravel or slag surfaced roofs 44
" 6-LS, for smooth surfaced roofs 44
" 6-LM, for metal roofs and gutters 44
" 1-LT, for tile or similar surfaced roofs 45
" 6-LT, for tile or similar surfaced roofs 45

Method of Installing Barrett-Holt Vent Connections:

Type 6-VG, for gravel or slag surfaced roofs 46
" 6-VS, for smooth surfaced roofs 46
" 6-VT, for tile surfaced roofs 46
" 6-VM, for metal roofs and gutters 46

SECTION 5—WATERPROOFING

Waterproofing Against Hydrostatic Pressure . 47

Membrane Method—Substructure Waterproofing (for Walls, Footings, Pits, Vaults, Etc.) . . 48 and 49
" " —Swimming Pools, Shower Rooms, Etc. 50
" " —Elevated Highways or Bridges, Ramps, Etc. 51
" " —Solid Deck Railroad Bridges . . . 52
Flashing Details —Solid Deck Railroad Bridges 53
Membrane Method—Underground Subways, Tunnels, Etc. . 54
" " —Reservoirs, Basins, Etc. 55
" " —Superstructure, Concrete or Wood Floors 56

SECTION 6—DAMPPROOFING

Dampproofing Against Moisture 57

Foundation Walls, Retaining Walls and Abutments . . . 58
Stone Backing and Stainproof Method for Exterior Face Stone 59
Dampproof Coating and Plaster Bond for Masonry Walls Above Grade (Plastic Type) 60
Dampproof Coating and Plaster Bond for Masonry Walls Above Grade (Liquid Coating and Semi-Mastic Type) 61
Dampproof Coating and Plaster Bond for Masonry Walls Above Grade (Tile Finish) 62
Dampproof and Wood Preservative Methods for Floors . . 63
Dampproofing for Use Under Wood Floors Over Earth or Over Concrete Base (Barrett Tar-Rok Method) . . . 64
Details for Waterproofing Basements 65
Coal Tar Emulsion Dampproofing and Curing Compound for Concrete 66
Barrett Approved Roofer 67

FOREWORD

This manual contains specifications and detailed drawings treating with the following subjects:

Built-Up Roofing—for flat roof decks—Section 1
Built-Up Roofing—for steep roof decks—Section 2
Roof Flashing ..... Section 3
Roof Drainage ..... Section 4
Waterproofing ..... Section 5
Dampproofing ..... Section 6

The data presented comprise the most practical methods and procedure based on three quarters of a century's experience, the essence of which is incorporated to the fullest extent possible. The details are arranged to show exactly the construction secured when the accompanying specifications are adhered to . . . the object being to provide the architect, builder or building owner with reference material which is designed from his viewpoint and with his interest in mind.

Architects and construction engineers in all parts of the country have found the methods recommended by Barrett in this manual to be entirely reliable and in accord with the most up-to-date engineering practices. The practical demonstration of their value is evidenced by their use on so many of the nation's finest and largest structures.

For any unusual roofing or waterproofing problems, or conditions not covered in this book, a construction service department is maintained, the members of which are available for consultation at any time and without obligation.

THE TECHNICAL SERVICE BUREAU

of THE BARRETT COMPANY places at the disposal of all those interested, general and technical information and facts of value in the fields served by BARRETT. This service is supplied without cost or obligation as THE BARRETT COMPANY'S contribution to the broad development of these fields in which it has been identified with leadership for many years. Address The Technical Service Bureau of THE BARRETT COMPANY, 40 Rector Street, New York, N. Y.

THE BARRETT COMPANY
40 RECTOR STREET • NEW YORK • N. Y.

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Alabama

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Montreal, Que.

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Barrett

PROTECTION FOR BUILDINGS

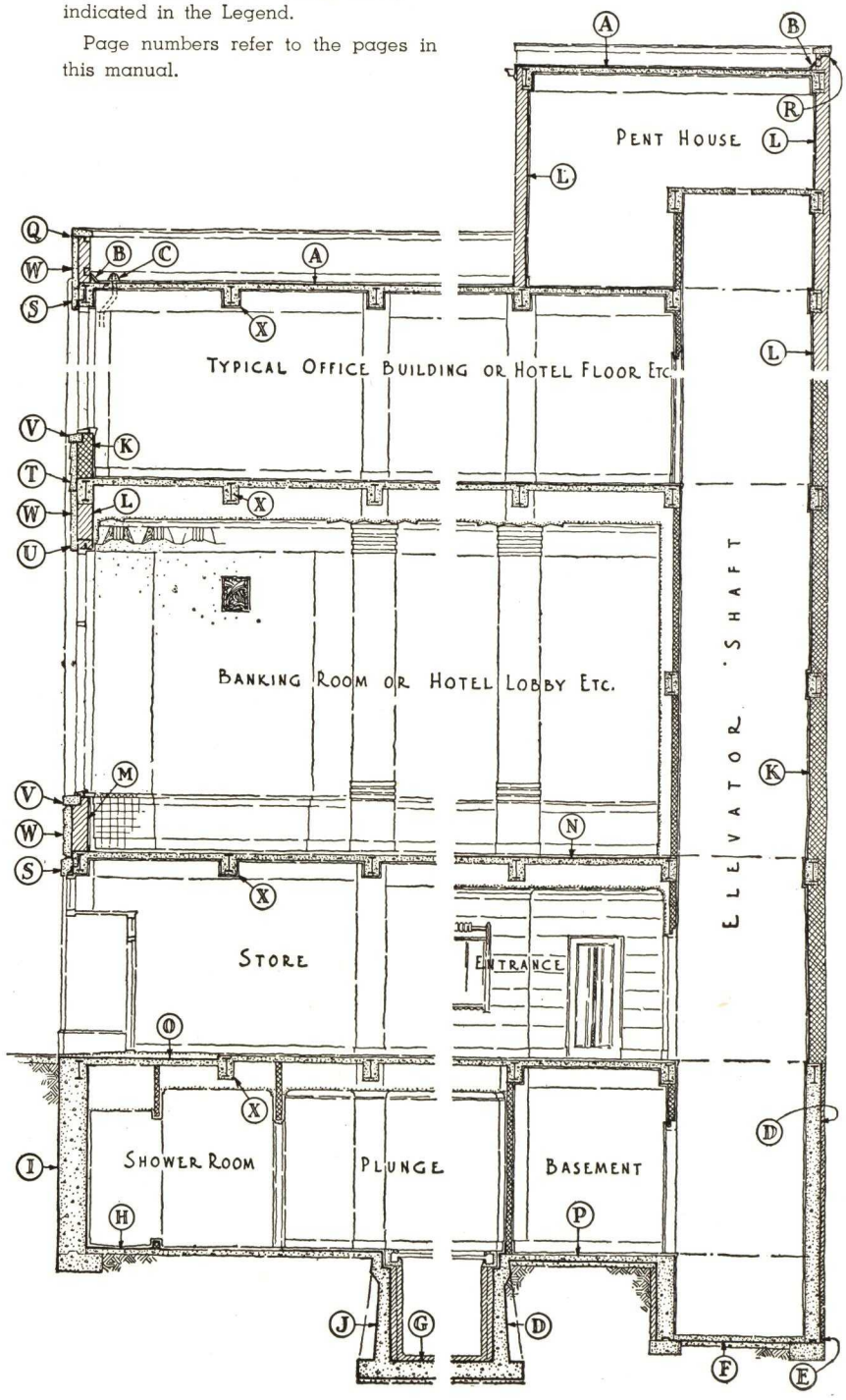
BUILT-UP ROOFING • FLASHING • DAMPPROOFING MEMBRANE WATERPROOFING • ROOF DRAINAGE

LEGEND

		Page
ROOFING		
A	Barrett Specification Roofs	9
B	Barrett Roof Flashing System	27
C	Barrett Roof Drainage System	39
BARRETT WATERPROOFING SYSTEM		
	Membrane Method	
D	Substructure waterproofing	48-49
E	Outside walls and footings	48-49
F	Waterproofing elevator pit	49
G	Waterproofing of swimming pool	50
H	Waterproofing of shower room and stalls	50
BARRETT DAMPPROOFING SYSTEMS		
	Dampproofing—Walls	
I	Hydronon method for foundation walls, retaining walls and abutments	58
J	Pitch Coating Method for foundation walls, retaining walls and abutments	58
K	Dampproof Coating and Plaster Bond Method for hollow tile walls	61
L	Dampproof Coating and Plaster Bond Method for brick walls	60
M	Method of applying tile over dampproof coating	62
	Dampproofing—Floors	
N	Hydronon method for wood floors	63
O	Hydronon method for cement floors	63
P	Tar-Rok method	63-64
BARRETT FLASHING SYSTEM		
	Parapet Walls	
Q	Through wall flashing	32-34-36
R	Through wall flashing	32-34-36
	Spandrel Beams	
S	Spandrel Flashing, Base and Counter Type	36
T	Spandrel Flashing Counter Type	36
U	Window Head Flashing	36
V	Window Sill Flashing	36
	Stone Backing	
W	Stone backing and stainproof method for exterior face stone	59
BARRETT PROTECTIVE PAINT		
X	Everjet Protective Paint for Steel Beams, etc.	

Code letters on this drawing correspond to Barrett Specifications for roofing, waterproofing or dampproofing as indicated in the Legend.

Page numbers refer to the pages in this manual.



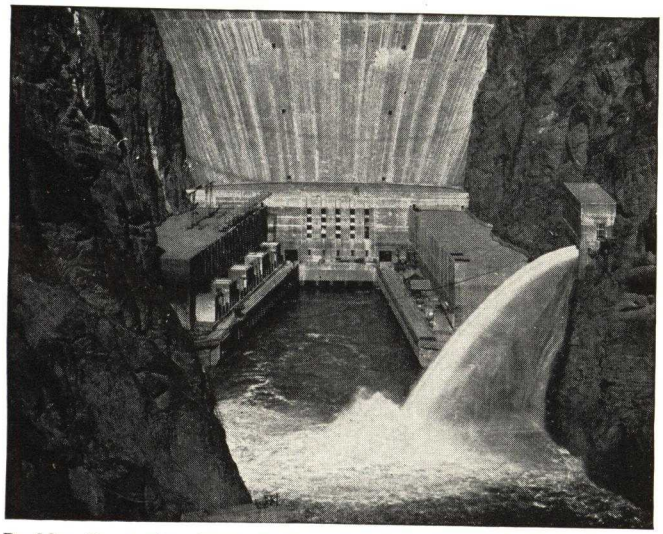
SINCE 1854

BETWEEN THE WORLD AND THE WEATHER

BARRETT'S leadership in roofing and waterproofing dates back more than three-quarters of a century. Pioneers in the field, Barrett has, since the early days of built-up roof construction, improved its materials, application methods and facilities for service, stride for stride with the advance of the building industry.

Today the famous Barrett Specification is recognized everywhere as the standard of value for built-up roof construction—a ranking consistently held since its introduction decades ago. Barrett introduced the practice of bonding roofs, definitely freeing building owners from periodical repair or maintenance expense. Barrett initiated the bonding of roof flashing, eliminating divided responsibility. The Barrett organization of approved roofing contractors was the first ever established; and Barrett's complete roof inspection service, introduced years ago, is unique in the roofing field.

Exchange Building, Boston, Mass.—Barrett Roofed 1889



Boulder Dam—the Great U-shaped Power House Is Protected by Barrett Roofing Materials

That this complete service has obtained uniformly satisfactory results is demonstrated by thoroughly authenticated records of proved performance—many of the early installations having already given 30, 40 and 50 years of service without repair or maintenance expense. Repeat business from nationally recognized organizations substantiates these records and presents staunch testimony to the enduring qualities of Barrett Roof construction.

We believe that such records of performance, together with the universal acceptance of this type of roof by leading architects, engineers and builders of modern structures, convincingly demonstrate that there are no better materials for built-up roof construction than high quality coal tar pitch and roofing felt . . . and that no finer materials of this character are obtainable than those bearing the Barrett label.

Barrett

Then.....

Time gives proof of roof performance. It is not unusual for Barrett Roofs to outlive the useful lives of the buildings on which they are placed. There are hundreds of Barrett Coal-tar Pitch and Felt Roofs giving 100% satisfaction after 40 to 50 years of hard service. These records, unique in the built-up roofing industry, point the way for building owners who want complete and lasting freedom from roof worries.

The dominance of Barrett Built-Up Roofs in almost every community is proof that the outstanding merit of Bar-

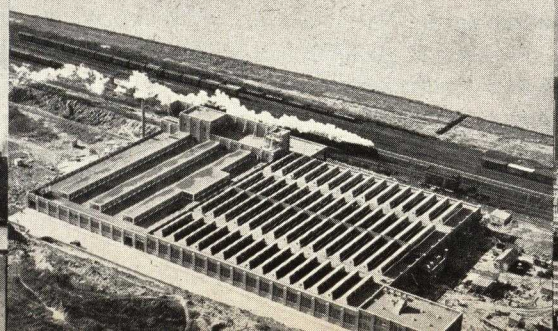
Barrett

and Now

rett Roof materials and methods is today universally recognized by architects and engineers. They have specified Barrett Roofs for America's greatest buildings (every world's tallest building since the Woolworth has had a Barrett Roof) . . . for huge manufacturing plants, public buildings, hotels, apartment buildings, schools and colleges, store and office buildings, and modern flat-roofed houses.

For monumental structure or simple business block, Barrett Specification Roofs represent the soundest investment.

Roofs



Barrett Specification Roofs

* Trade Mark Registered U. S. Pat. Off.

Exact and definite building specifications encourage fair bidding practices and promote good construction. They are welcomed by reliable contractors because they establish recognized standards and truly comparative proposals.

The Barrett Specification stipulates known quantities, known qualities and known application technique to produce a known result—a roof that will be free from upkeep and maintenance expense for 20 years, at least.

Both Barrett Specification Pitch and Barrett Specification Felt are manufactured to be—and conceded to be—the best it is possible to produce. Barrett Specification Pitch is preserved by water. Its life-prolonging oils are protected by the same dampness and moisture that weaken ordinary materials. It is self-healing; is virtually immune to climatic variations; and possesses creosote properties that outlaw fermentation or the development of fungi. Roofing gravel, slag, slate or tile provides a fire-safe, practically indestructible wearing surface which protects the membrane, reflects heat and permits the use of a maximum of waterproofing materials. Barrett Specification Roofs carry Underwriters' Class "A" rating . . . the base rate for insurance.

Barrett Specification Roofs are applied only by Barrett Approved Roofers; the selection of whom is based upon experience, ability and integrity. Architects, engineers and builders may rely on them completely to satisfactorily execute the character of work incorporated in this publication.

UNITED STATES FIDELITY & GUARANTY COMPANY
BALTIMORE, MD.

Barrett Specification Roof
TYPE "AA"

20-Year Guaranty Bond

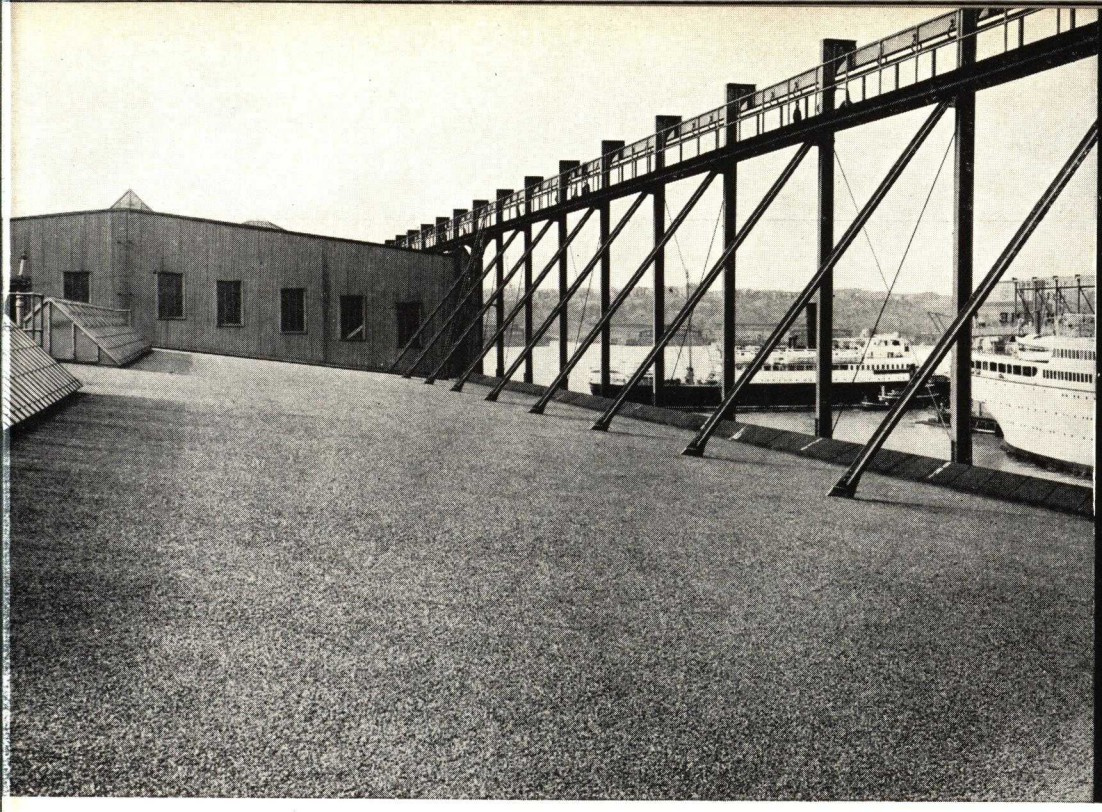
The Barrett Bond

Barrett Specification Roofs are bonded by the United States Fidelity and Guaranty Company against repair and maintenance expense, thus providing a certainty of performance that is seldom equaled in the building industry. Barrett Specification Roofs, Type "AA" are bonded for 20 years; Type "A" for 15 years, in accordance with specifications in this manual. Barrett also bonds its flashing systems for like periods when the flashing is installed in conjunction with the application of a Barrett Bonded Roof. This complete service is furnished under one contract and eliminates divided responsibility on this important work.

The Barrett Inspector Making the Famous "Section Test"

Barrett Roof Inspection Service

Barrett Roof Inspection Service, introduced by Barrett years ago, is unique in the roofing field. The work of Barrett Approved Roofers is executed under the direct supervision of technically trained Barrett Inspectors, assuring to the purchaser roof performance far beyond that prescribed in any guarantee or bond. The services of a Barrett Roof Inspector are available for consultation without cost or obligation to owners of flat-roofed buildings east of the Rockies. He will render a complete, detailed, unbiased report on conditions found and recommend adequate procedure where corrections or repairs are required.



SECTION 1

FLAT ROOFS

INCLINES NOT TO EXCEED 2 INS. TO 1 FT.

BARRETT SPECIFICATION ROOFS

TYPE "AA"—BONDED FOR 20 YEARS
TYPE "A"—BONDED FOR 15 YEARS

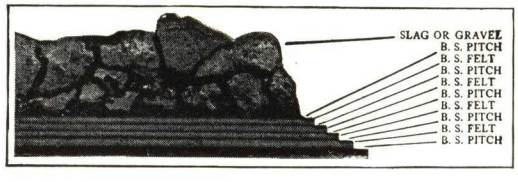
Flat Roof Classification

Roofs having inclines of not more than two inches in one foot are generally classified as flat roofs.

The practical purpose of the flat roof, or of any roof, is to protect the interior, the contents and the occupants of a building from rain, snow, heat and cold. In addition, a good roof should provide effectual protection against the spread of fire, prevent dampness, add to the character of the building, and offer freedom from periodical repair or maintenance expense.

The Barrett Specification for Flat Roofs

The Barrett Specification Roof—Type "AA" or Type "A"—meets these requirements for flat roof construction. It is constructed of highest quality coal tar pitch and roofing felt, properly applied in the membrane manner; and surfaced with gravel, roofing slag, promenade slate or quarry tile.



Barrett Specification Roofing

Built of alternate layers of Barrett Specification Pitch and Felt (the top coat of pitch is poured) with an indestructible wearing surface of gravel or slag.

Insurance Savings

Barrett Specification Roofs take the base rate of insurance. They require no painting or coating. Their moderate first cost and enduring qualities effect a cost per year of service far below that of any other type of built-up roof known. They provide a permanent part of permanent building construction.

Black Diamond Roofs

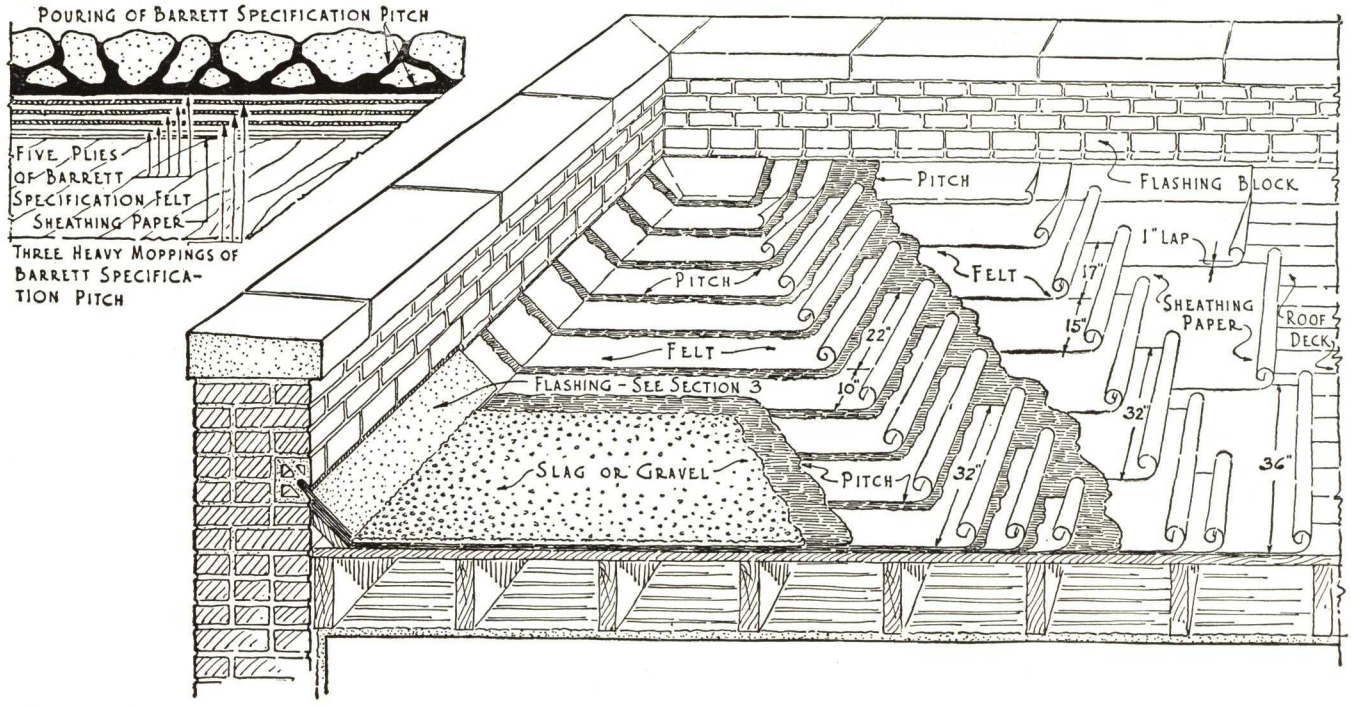
Barrett also manufactures the time-tested Black Diamond Roofing Materials. Black Diamond Pitch and Black Diamond Felt meet the exacting requirements of recognized Government, ASTM and AREA specifications. When applied by Barrett Approved Roofers, in accordance with our requirements and specification procedure contained herein, Barrett Black Diamond Roofs are bonded against repair and maintenance expense for the periods stated.

Specifications

The specifications which follow are based on proper use of materials of recognized quality and quantity. They have been formulated by THE BARRETT COMPANY and cover many particular types of flat roof construction recommended for use under the specific conditions outlined. Specifications for procedure under conditions not contained herein, or where re-roofing operations are involved, will be furnished gladly on request.

Barrett
SINCE 1854

FOR USE OVER—Wood Decks.
INCLINE—Not exceeding 2″ to 1′-0″.
TYPE "AA"—5 Ply Construction.
TYPE "A"—4 Ply Construction.



20 YEAR BOND TYPE "AA" BARRETT SPECIFICATION ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification (for use over boards), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY's Surety Bond Guaranty for twenty (20) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knot holes, and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

APPLICATION OF ROOFING—First—Lay one (1) thickness of sheathing paper or unsaturated felt weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheets at least one (1) inch.

Second—Over the entire surface lay two (2) plies of Barrett Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one and nail as often as is necessary to hold in place until remaining Felt is laid.

Third—Coat the entire surface uniformly with Barrett Specification Pitch.

Fourth—Over the entire surface lay three (3) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Barrett Specification Pitch the full twenty-two (22) inch lap on each sheet so that in no place shall Felt touch Felt. Such nailing as is necessary shall be done along the upper edge of each sheet so that all nails will be covered by not less than two (2) plies of Felt.

Fifth—Over the entire surface pour from a dipper a uniform coating of Barrett Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

GENERAL—The Felt shall be laid without wrinkles or buckles. Not less than one hundred and fifty (150) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY's Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Co. of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its Guaranty Bond on jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

15 YEAR BOND TYPE "A" BARRETT SPECIFICATION ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification (for use over boards), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY's Surety Bond Guaranty for fifteen (15) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

Exactly the same as for Type "AA" above, except for the following changes:

APPLICATION OF ROOFING—Fourth—Over the entire surface lay two (2) plies of Barrett Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Barrett Specification Pitch the full seventeen (17) inch lap on each sheet so that in no place shall Felt touch Felt. (Balance of paragraph remains the same.)

GENERAL—Change "one hundred and fifty (150)" to "one hundred and twenty-five (125)" pounds of Pitch.

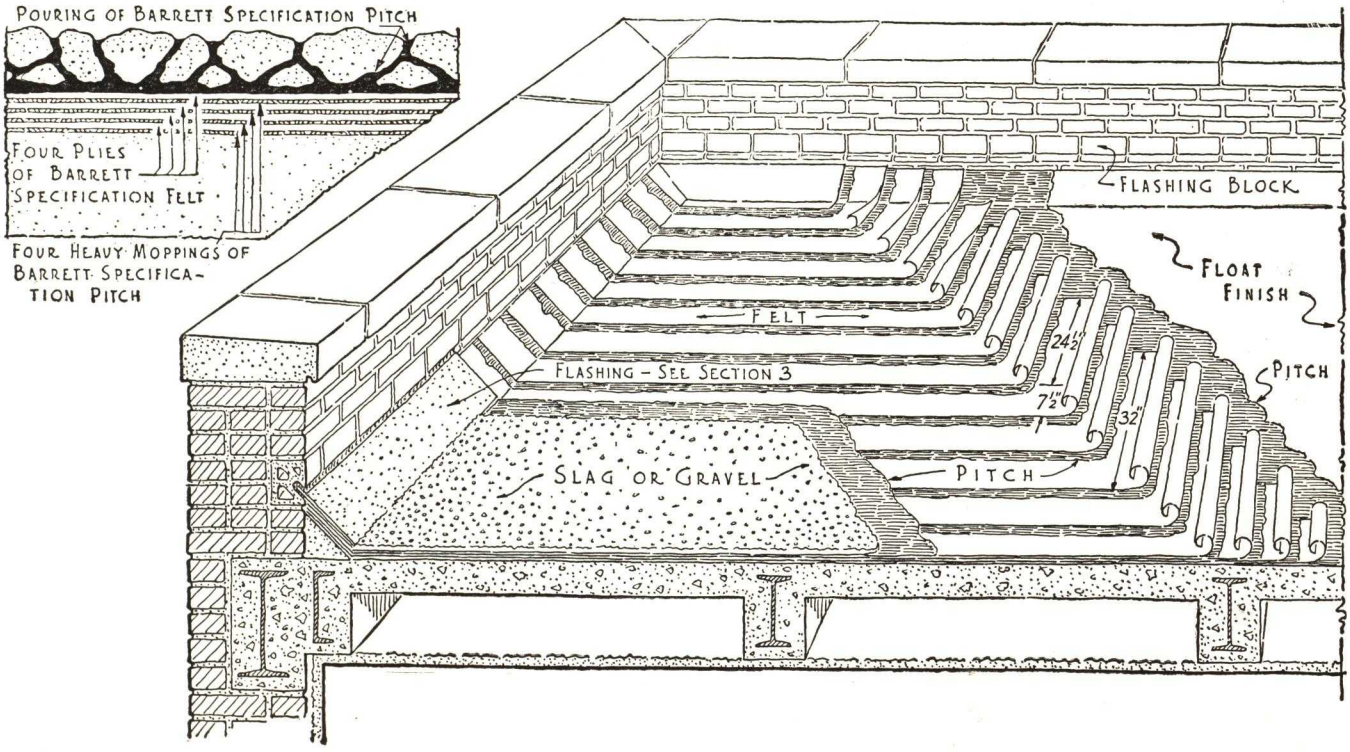
Change "period of twenty (20)" to "period of fifteen (15)" years.

Where Insulation Is Required, See Detail on Page 18.

See Section No. 3 for Flashing Specifications and Details.

FOR USE OVER—Poured Concrete or Poured Gypsum.
INCLINE—Not exceeding 2″ to 1′-0″.
TYPE "AA"—4 Ply Construction.
TYPE "A"—3 Ply Construction.

Barrett SINCE 1854



20 YEAR BOND TYPE "AA" BARRETT SPECIFICATION ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "AA," laid in accordance with the Barrett Specification (for use over poured concrete or poured gypsum) by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for twenty (20) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—The roof deck shall be smooth, firm, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets. On inclines exceeding one (1) inch to the foot, roof deck shall permit nailing or wood nailing strips shall be provided.

APPLICATION OF ROOFING—First—Coat the roof deck uniformly with Barrett Specification Pitch.

Second—Over the entire surface lay four (4) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding one, mopping with Barrett Specification Pitch the full twenty-four and one-half (24½) inch lap on each sheet, so that in no place shall Felt touch Felt. Such nailing as is necessary shall be done along upper edge of each sheet so that all nails shall be covered by not less than three (3) plies of Felt.

Third—Over the entire surface pour from a dipper a uniform coating of Barrett Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

GENERAL—The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its Guaranty Bond on jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

15 YEAR BOND TYPE "A" BARRETT SPECIFICATION ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification (for use over poured concrete or poured gypsum) by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for fifteen (15) years from date of completion, in accordance with Note. No. 1 of said specification.

COMPLETE SPECIFICATION

Exactly the same as for Type "AA" above, except for the following changes:

APPLICATION OF ROOFING—Change the first sentence under "Second" to read as follows:

Second—Over the entire surface lay three (3) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Barrett Specification Pitch the full twenty-two (22) inch lap on each sheet so that in no place shall Felt touch Felt. (The balance of this paragraph is the same as for Type "AA".)

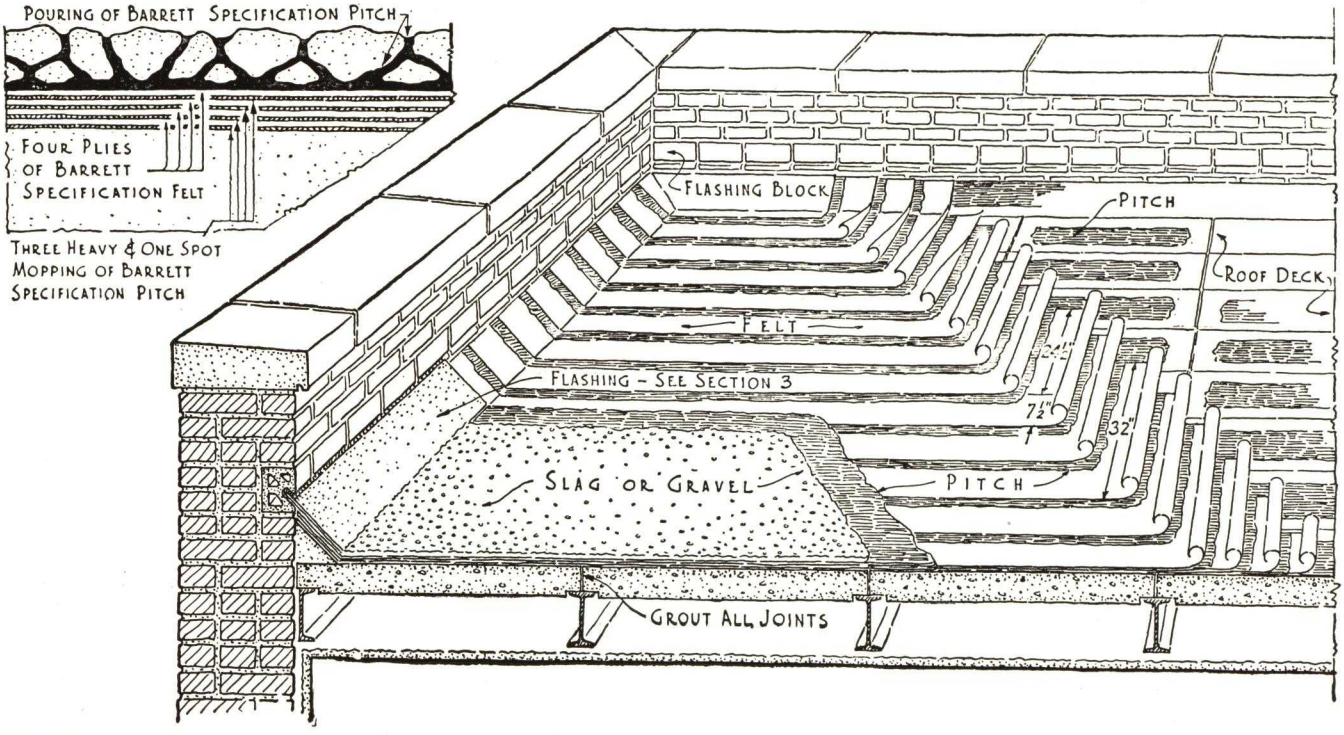
GENERAL—Change "two hundred (200)" to "one hundred and seventy-five (175)" pounds of Pitch.

Change "period of twenty (20)" to "period of fifteen (15)" years.

Where Insulation Is Required, See Detail on Page 18.

See Section No. 3 for Flashing Specifications and Details.

FOR USE OVER—Precast Concrete Slabs.
INCLINE—Not exceeding 2″ to 1′-0″.
TYPE "AA"—4 Ply Construction.
TYPE "A"—3 Ply Construction.



20 YEAR BOND TYPE "AA" BARRETT SPECIFICATION ROOF

***Note*—Provision shall be made for Nailing Strips set parallel with incline of roof and spaced not more than three (3) feet apart.**

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification (for use over precast concrete slabs), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for twenty (20) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—All joints between concrete slabs shall be properly grouted.

The roof deck shall be smooth, firm, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

APPLICATION OF ROOFING—First—Spot or strip mop each slab with Barrett Specification Pitch, care being taken that pitch moppings are held back to within four (4) inches from the edge of each joint.

Second—Over the entire surface lay four (4) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches, over preceding one, mopping with Barrett Specification Pitch the full twenty-four and one-half (24½) inch lap on each sheet, so that in no place shall Felt touch Felt. Nail each sheet along upper edge so that nails are covered by not less than three (3) plies of Felt.

Third—Over the entire surface pour from a dipper a uniform coating of Barrett Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

GENERAL—The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note. No. 1.

***Note No. 1*—THE BARRETT COMPANY will give its Guaranty Bond on jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.**

15 YEAR BOND TYPE "A" BARRETT SPECIFICATION ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification (for use over precast concrete slabs), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for fifteen (15) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

Exactly the same as for Type "AA" above, except for the following changes:

APPLICATION OF ROOFING—Change paragraph headed "Second", to read as follows:

Second—Over the entire surface lay three (3) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Barrett Specification Pitch the full twenty-two (22) inch lap on each sheet so that in no place shall Felt touch Felt.

GENERAL—Change "two hundred (200)" to "one hundred and seventy-five (175)" pounds of Pitch.

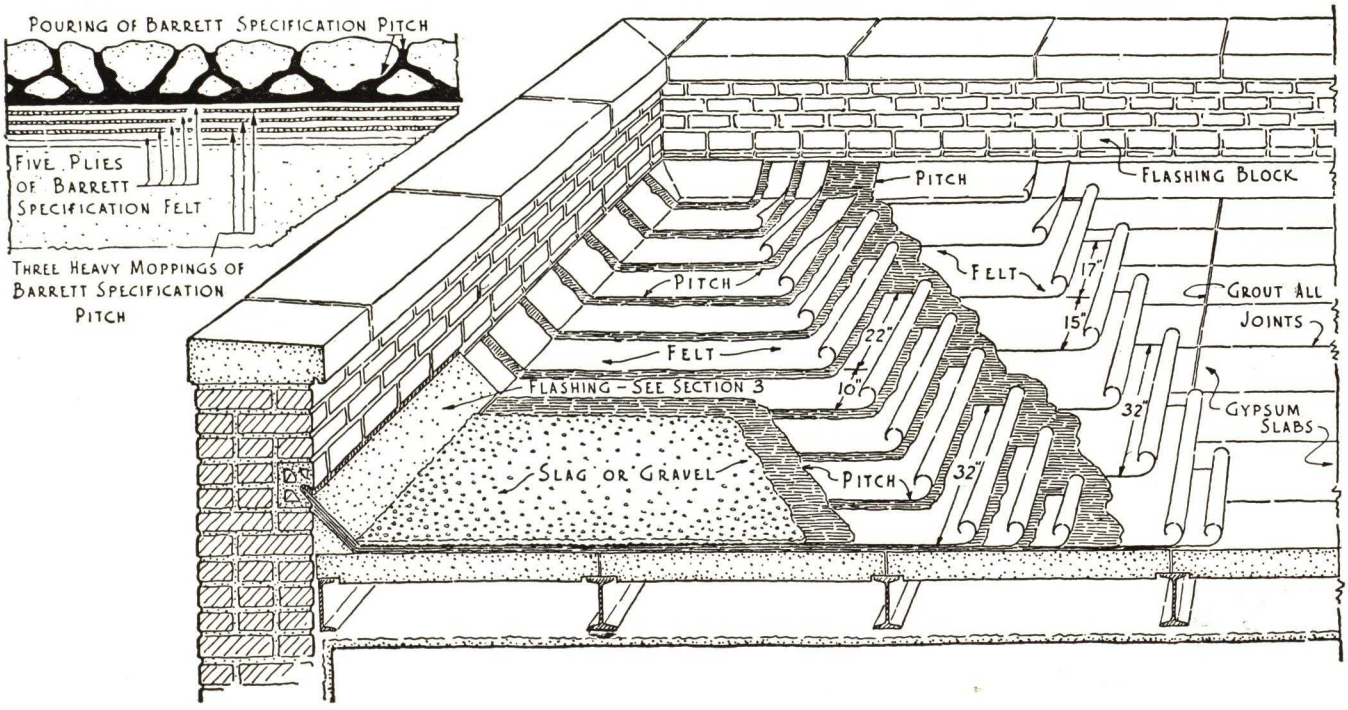
Change "period of twenty (20)" to "period of fifteen (15)" years.

Where Insulation Is Required, See Detail on Page 18.

See Section No. 3 for Flashing Specifications and Details.

FOR USE OVER—Precast Gypsum Slabs.
INCLINE—Not exceeding 2″ to 1′-0″.
TYPE "AA"—5 Ply Construction.
TYPE "A"—4 Ply Construction.

Barrett SINCE 1854



20 YEAR BOND TYPE "AA" BARRETT SPECIFICATION ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification (for use over precast gypsum slabs), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY's Surety Bond Guaranty for twenty (20) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—All joints between precast gypsum slabs shall be properly grouted.

The roof deck shall be smooth, dry and free from loose material. If roof deck is inclined, it shall be properly graded to outlets.

APPLICATION OF ROOFING—First—Over the entire surface lay two (2) plies of Barrett Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, and nail as often as is necessary to hold in place until remaining Felt is laid.

Second—Coat the entire surface uniformly with Barrett Specification Pitch.

Third—Over the entire surface lay three (3) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Barrett Specification Pitch the full twenty-two (22) inch lap on each sheet so that in no place shall Felt touch Felt. Each sheet shall be nailed six (6) inches from the upper edge, nails to be spaced not more than two (2) feet apart. Nails shall not exceed seven-eighths (⅞) inch in length and shall be driven through flat tin discs one (1) inch or more in diameter.

Fourth—Over the entire surface pour from a dipper a uniform coating of Barrett Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

GENERAL—The Felt shall be laid without wrinkles or buckles. Not less than one hundred and fifty (150) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY's Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its Guaranty Bond on jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

15 YEAR BOND TYPE "A" BARRETT SPECIFICATION ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "A" laid in accordance with the Barrett Specification (for use over precast gypsum slabs), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY's Surety Bond Guaranty for fifteen (15) years from date of completion, in accordance with Note. No. 1 of said specification.

COMPLETE SPECIFICATION

Exactly the same as for Type "AA" above, except for the following changes:

APPLICATION OF ROOFING—Change the first sentence of paragraph headed "Third", to read as follows:

Third—Over the entire surface lay two (2) plies of Barrett Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Barrett Specification Pitch the full seventeen (17) inch lap on each sheet so that in no place shall Felt touch Felt. (The balance of this paragraph is the same as for Type "AA").

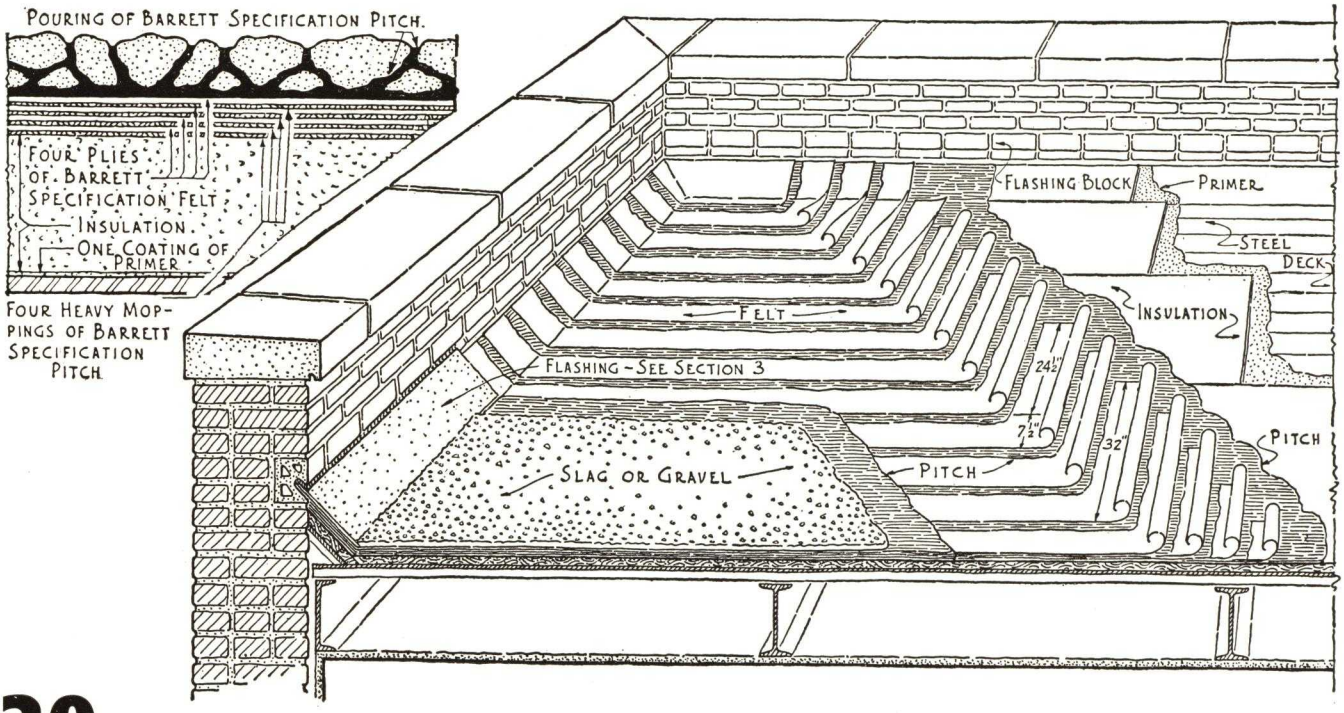
GENERAL—Change "one hundred and fifty (150)" to "one hundred and twenty-five (125)" pounds of Pitch.

Change "period of twenty (20)" to "period of fifteen (15)" years.

Where Insulation Is Required, See Detail on Page 18.

See Section No. 3 for Flashing Specifications and Details.

FOR USE OVER—Insulated Steel Decks.
INCLINE—Not exceeding 1″ to 1′-0″.
TYPE "AA"—4 Ply Construction.
TYPE "A"—3 Ply Construction.



20 YEAR BOND TYPE "AA" BARRETT SPECIFICATION ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "AA", laid in accordance with the Barrett Specification (for use over steel roof decks), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY's Surety Bond Guaranty for twenty (20) years from date of completion in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—The roof deck shall be smooth, firm, dry and free from rust, grease or loose material. The weather surface shall be factory-primed to receive the roof covering. If roof deck is inclined, it shall be properly graded to outlets.

APPLICATION OF ROOFING—First—Over the entire surface spread a uniform coating of Barrett STEEP Roofing Asphalt into which, while hot, embed approved rigid roof insulation as specified. Insulation shall be kept and applied in a dry condition and shall be firm and free from defects or loose materials. Cut-offs consisting of two (2) plies of Barrett Waterproofing Fabric and three (3) moppings of Barrett STEEP Roofing Asphalt shall be applied every twenty (20) feet, during the application of the insulation, and such cut-offs shall extend at least six (6) inches on roof deck and four (4) inches on top of insulation. No more insulation shall be applied than can be immediately covered with roofing. Care shall be taken that all ends are properly flashed so that at no time shall surface or edges of insulation be exposed.

Second—Coat the entire surface of the insulation with Barrett Specification Pitch.

Third—Over the entire surface lay four (4) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding one, mopping with Barrett Specification Pitch the full twenty-four and one-half (24½) inch lap, so that in no place shall Felt touch Felt. Each sheet shall be nailed three (3) inches from upper edge, with soft-nosed nails of sufficient length to extend through the insulation and clinch. Nails to be spaced not more than two (2) feet apart.

Fourth—Over the entire surface pour from a dipper a uniform coating of Barrett Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

GENERAL—The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY's Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion, in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its Guaranty Bond on jobs of five thousand (5000) square feet or more in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval.

15 YEAR BOND TYPE "A" BARRETT SPECIFICATION ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification Roof, Type "A", laid in accordance with the Barrett Specification (for use over steel roof decks), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY's Surety Bond Guaranty for fifteen (15) years from date of completion in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

Exactly the same as for Type "AA" above, except for the following changes:

APPLICATION OF ROOFING—Change paragraph headed "Third" to read as follows:

Third—Over the entire surface lay three (3) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Barrett Specification Pitch the full twenty-two (22) inch lap, so that in no place shall Felt touch Felt. (Balance of paragraph remains the same.)

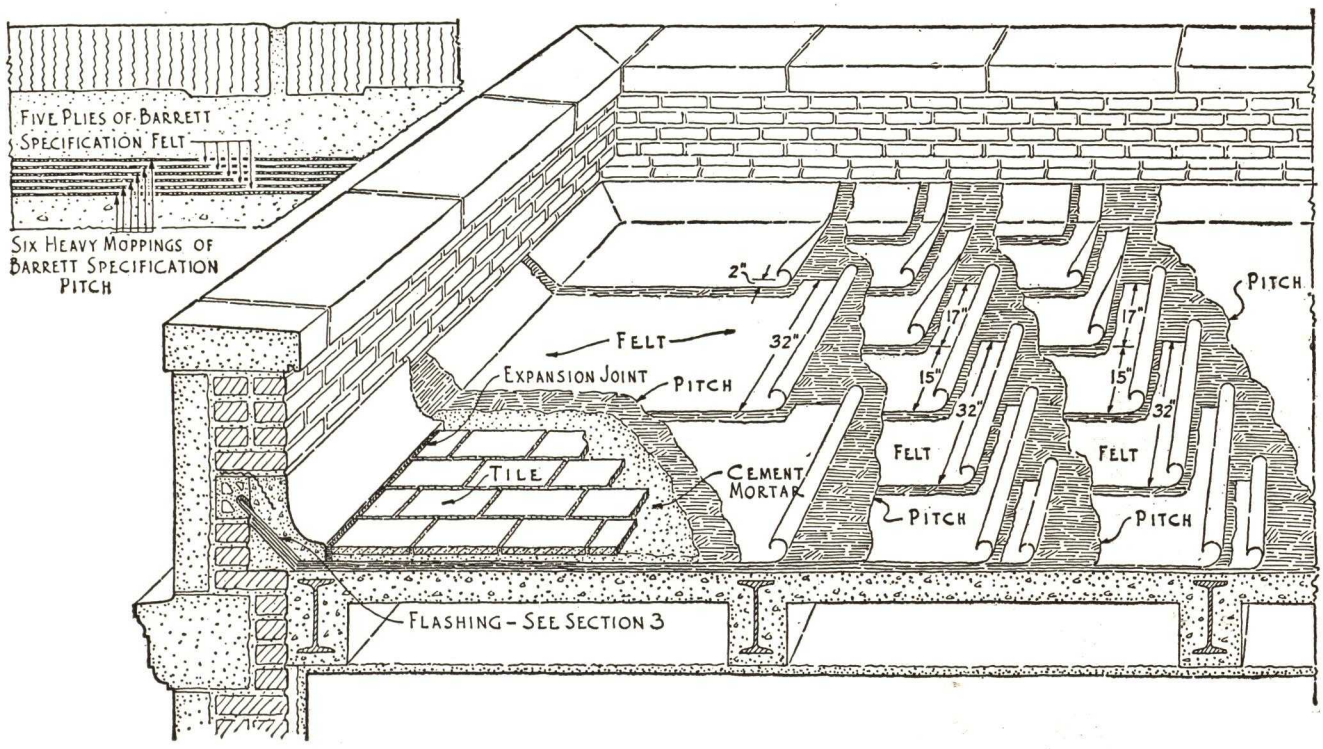
GENERAL—Change "two hundred (200)" to "one hundred seventy-five (175)" pounds of Pitch.

Change "period of twenty (20)" to "period of fifteen (15)" years.

See Section No. 3 for Flashing Specifications and Details.

FOR USE OVER—Concrete.
INCLINE—Not exceeding 1″ to 1′-0″.
5-PLY CONSTRUCTION.
SURFACING—Promenade Tile.

Barrett SINCE 1854



BARRETT SPECIFICATION 5-PLY ROOF OVER CONCRETE FOR USE UNDER PROMENADE TILE

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification 5-Ply Roof, and shall be laid in accordance with the Barrett Specification (for use under promenade tile), by a roofing contractor approved by THE BARRETT COMPANY, who has had experience in this kind of work, and who can refer to similar installations where his work has proved satisfactory.

COMPLETE SPECIFICATION

PREPARATION OF DECK—The roof deck shall be smooth, firm, dry, properly graded to outlets, and free from loose material.

APPLICATION OF ROOFING—First—Coat the concrete uniformly with Barrett Specification Pitch.

Second—Over the entire surface lay two (2) plies of Barrett Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Barrett Specification Pitch the full seventeen (17) inch lap on each sheet, so that in no place shall Felt touch Felt.

Third—Coat the entire surface uniformly with Barrett Specification Pitch.

Fourth—Over the entire surface lay two (2) plies of Barrett Specification Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Barrett Specification Pitch the full seventeen (17) inch lap on each sheet, so that in no place shall Felt touch Felt.

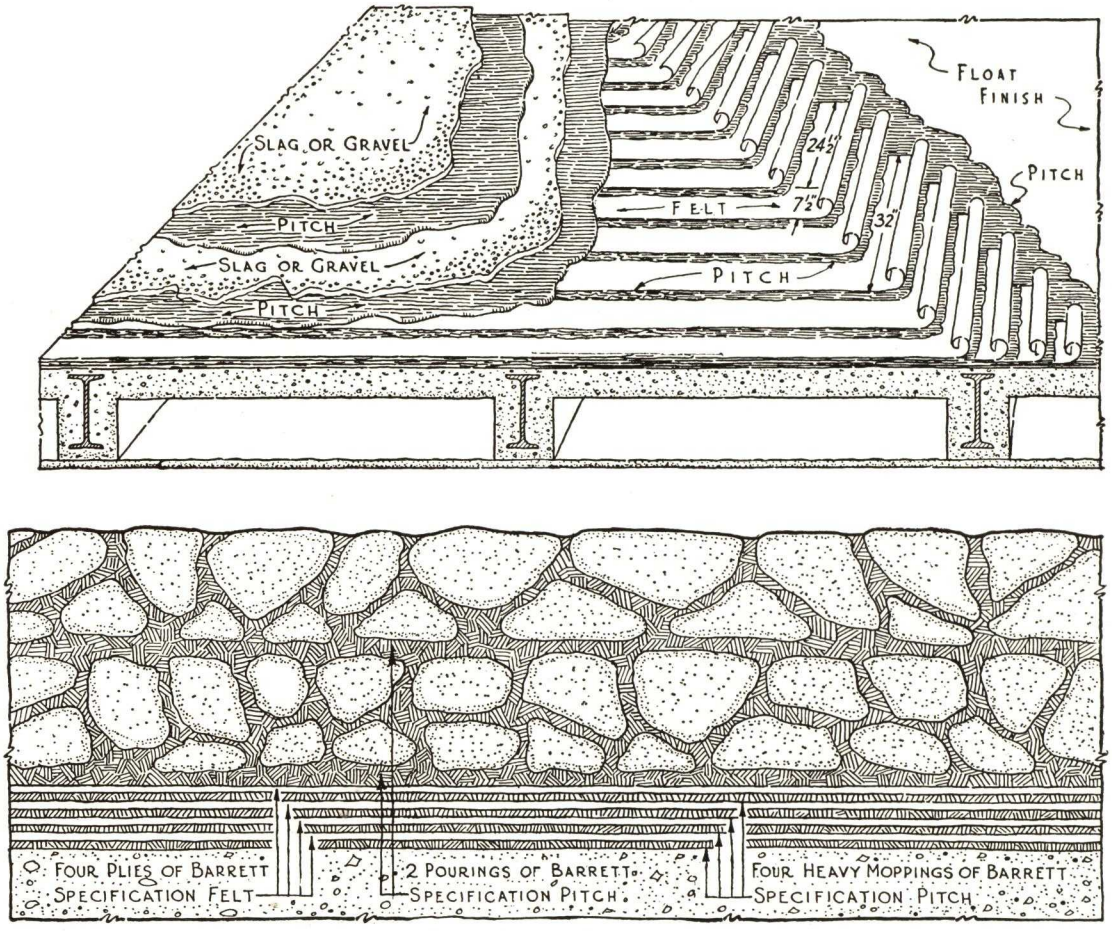
Fifth—Immediately preceding the laying of the tile, thoroughly clean the surface of the roof and mop same with Barrett Specification Pitch, into which, while hot, embed one (1) layer of Specification Felt, lapping each sheet two (2) inches over preceding one. Over this surface and immediately preceding the laying of the tile spread a heavy uniform coating of Barrett Specification Pitch. No more of the roof surface shall be covered with the final or last ply of Felt and mopping of Pitch than is covered at the same time with tile and is necessary to allow for proper connections.

Over the Felt and Pitch roofing thus laid, 1 x 6 x 9-inch vitrified clay tile (approved by the architect) shall be set in not less than three-fourths (¾) inch of Portland Cement Mortar (1 to 3 mix) and joints grouted full with Portland Cement Mortar (1 to 2 mix). The tile shall be laid to show three-sixteenths (3/16) inch to one-fourth (¼) inch joints. Expansion joints three-fourths (¾) inch wide filled with a plastic mixture (approved by the architect) shall be provided between the tile and all flashings, and either metal or mastic expansion joints shall be provided throughout the roof surface as may be necessary to take care of expansion. All expansion joints shall extend from the top of the tile through the cement mortar to the Felt and Pitch waterproofing and in no case shall expansion joints be spaced more than twenty (20) feet apart.

GENERAL—The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit. The roofing contract shall be awarded to a roofing contractor approved by THE BARRETT COMPANY, who has had experience in this kind of work, and who can refer to similar installations where his work has proved satisfactory.

See Section No. 3 for Flashing Specifications and Details.

FOR USE OVER—Poured Concrete.
INCLINE—Not exceeding 1/2″ to 1′-0″.
4-PLY CONSTRUCTION—DOUBLE SURFACING.



FULL SIZE SECTION

BARRETT SPECIFICATION ROOF FOR UTILITY OR SPRAY POND SERVICE

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Specification 4-Ply Roof, laid in accordance with the Barrett Specification (for use over concrete—double surfacing for utility or spray pond service), by a roofing contractor approved by THE BARRETT COMPANY.

COMPLETE SPECIFICATION

PREPARATION OF DECK—The roof deck shall be smooth, firm, dry, properly graded to outlets, and free from loose material.

APPLICATION OF ROOFING—First—Coat the concrete uniformly with Barrett Specification Pitch.

Second—Over the entire surface lay four (4) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding one, mopping with Barrett Specification Pitch the full twenty-four and one-half (24½) inch lap on each sheet, so that in no place shall Felt touch Felt. Only such nailing as is necessary shall be done along upper edge of each sheet so that all nails shall be covered by not less than three (3) plies of Felt.

Third—Immediately preceding the application of surfacing material, thoroughly clean the surface of the roofing, after which over the entire surface, pour from a dipper a uniform coating of Barrett Specification Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel, or three hundred (300) pounds of slag for each one hundred (100) square feet.

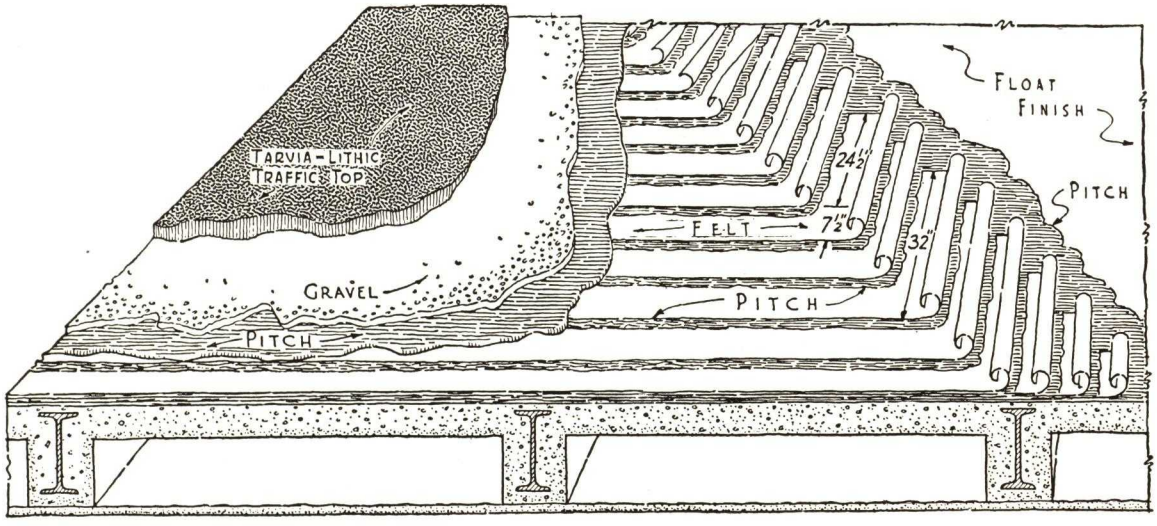
Fourth—Remove all loose or excess gravel or slag by lightly sweeping all surfaces and immediately follow with hot pouring of Barrett Specification Pitch, applied to all surfaces, into which, while hot, embed not less than three hundred (300) pounds of gravel, or two hundred (200) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) to five-eighths (⅝) inch in size, dry and free from dirt. All gravel or slag shall be firmly embedded in Pitch so that no loose particles appear in finished job. The finished surface may be lightly rolled if necessary.

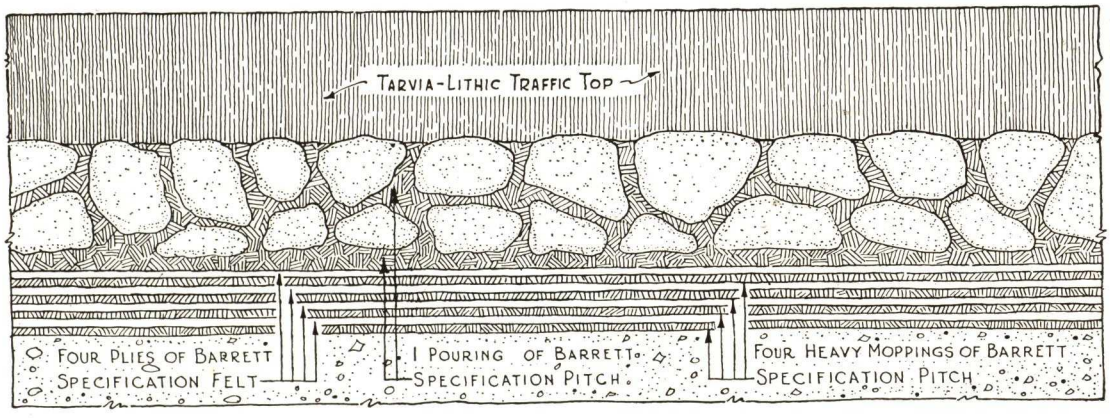
GENERAL—The Felt shall be laid without wrinkles or buckles. Not less than three hundred (300) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

The roofing contract shall be awarded to a roofing contractor, approved by THE BARRETT COMPANY, who has had experience in this kind of work, and can refer to similar installations where his work has proved satisfactory.

FOR USE OVER—Poured Concrete.
INCLINE—Not exceeding 1/2″ to 1′-0″.
SURFACING—Bituminous Traffic Top.

Barrett SINCE 1854





BITUMINOUS TRAFFIC TOP OVER ROOFING MEMBRANE

SPECIFICATION

The structural deck shall be smooth, firm, dry and free from dirt or loose material and shall be properly graded to outlets.

MEMBRANE—First—Coat the concrete uniformly with Barrett Specification Pitch.

Second—Over the entire surface lay four (4) plies of Barrett Specification Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding one, mopping with Barrett Specification Pitch the full twenty-four and one-half (24½) inch lap on each sheet, so that in no place shall Felt touch Felt. Only such nailing as is necessary shall be done along upper edge of each sheet so that all nails shall be covered by not less than three (3) plies of Felt.

Third—Over the entire surface apply a uniform coating of Barrett Specification Pitch, into which, while hot, embed not less than three hundred (300) pounds nor more than four hundred (400) pounds of gravel per one hundred (100) square feet of surface. The gravel shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

TRAFFIC TOP—First—Over the surface of the membrane apply Tarvia-lithic Traffic Top Mix uniformly and sufficiently to compact evenly to a thickness of one (1) inch under rolling. The Tarvia-lithic Mix shall be placed on metal plates and shoveled into position rather than dumped directly on to the membrane. Metal strips one and one-half (1½) inch high shall be used to secure proper loose thickness and shall be placed on ten (10) foot centers throughout the area to be surfaced. These strips shall be coated with a thin solution of lubricating oil to prevent sticking of the mixture during application.

The traffic top shall be rolled compact and even until the mixture does not creep under the roller. The rolling shall follow immediately after spreading of the mix over the membrane. After final rolling apply cement dust uniformly over the surface of the traffic top and broom into the surface with bristle brush.

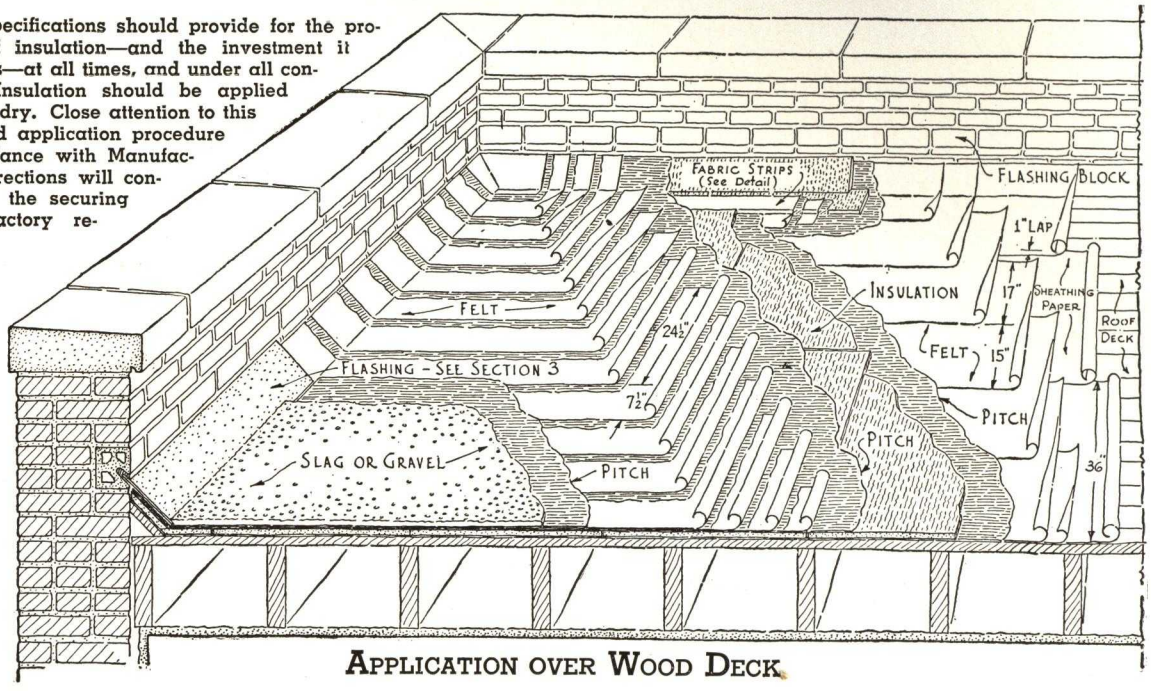
Notes—No. 1—Where outlets are provided, they shall be properly placed so as to be level with traffic top course after rolling and shall be suitably flanged and screened.

No. 2—Flashing shall be installed as required and shall be properly connected to membrane before application of the traffic top.

GENERAL—The work described above shall be applied by a contractor approved by THE BARRETT COMPANY, who has had experience on successfully applying this type of membrane and traffic top surfacing and who can refer to work of a similar nature which has been executed in a satisfactory manner.

ROOF INSULATION DETAILS.
FOR USE—Where Barrett Specification Roofs Are Installed Over Rigid Roof Insulation.

NOTE: Specifications should provide for the protection of insulation—and the investment it represents—at all times, and under all conditions. Insulation should be applied and kept dry. Close attention to this detail and application procedure in accordance with Manufacturers' directions will contribute to the securing of satisfactory results.



APPLICATION OVER WOOD DECK

DETAILS OF APPLICATION AND WATERPROOFING OF INSULATION OVER VARIOUS TYPES OF ROOF DECKS

ON WOOD ROOF DECKS—On wood roof decks, the installation of a waterproofing course, over which the insulation is applied, provides protection against moisture or deterioration from below. The waterproofing course should be of 2-ply construction over sheathing; i.e., each sheet lapped 17 inches over preceding one, and nailed along lower edge sufficiently to hold in place. All nails should be driven through flat tin discs and should not extend to under side of deck. The entire surface of the waterproofing course should then be coated with a uniform mopping of pitch into which, while hot, the insulation is laid.

OVER PRECAST SLABS—Over precast slabs, Rosin-sized sheathing may be omitted.

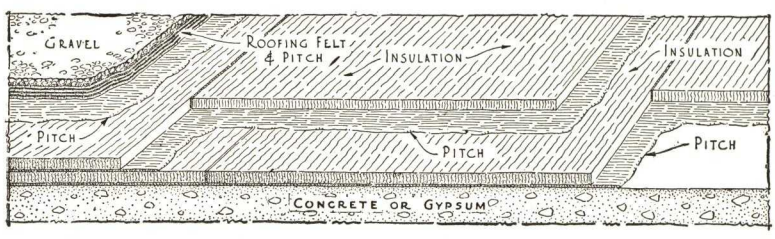
ON MONOLITHIC CONCRETE OR GYPSUM DECKS—On monolithic concrete or gypsum decks, the waterproofing course, consisting of two plies of tarred felt, is applied directly and fully to the roof deck. The felts should be stuck solidly to the deck, and together, with a uniform coating of hot pitch and the insulation laid in a hot mopping of pitch applied to the surface of the two-ply membrane. The roof deck in all cases shall be smooth, firm, free from loose materials, and shall be **dry.**

OVER INSULATION—Over insulation, and where base-protection course is provided, all roofing shall be solid-mopped as specified. Water cut-offs, consisting of 2 plies of Barrett Pitch Waterproofing Fabric and alternating moppings of pitch shall be installed at all edges of insulation adjoining parapet walls, curbs, or other vertical surfaces. Supplementary and continuous cut-offs of similar construction shall be installed approximately every 20 feet in each direction during application of insulation.

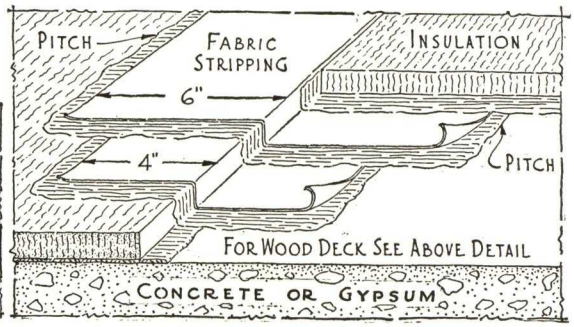
Note No. 1—Where multiple layers of insulation are installed, each succeeding layer shall break joints with underlying layer and shall be set in mopping of pitch.

Note No. 2—Insulation shall be immediately covered with roofing and edges shall be stripped and sealed after each day's work.

Where the above protection is provided, the specification for application of the roofing over insulation shall be in accordance with Type "AA" or Type "A" specification for use over poured concrete (page 11).



APPLICATION DETAIL FOR MULTIPLE LAYERS OF INSULATION



APPLICATION DETAIL FOR ONE LAYER OF INSULATION.
METHOD OF INSTALLING WATER CUT-OFF

SECTION 2 STEEP ROOFS

INCLINES EXCEEDING 2 INS. TO 1 FT.

BARRETT SPECIAL STEEP ROOFS

Steep Roof Classification

Roofs having inclines in excess of two inches in one foot are generally classified as steep roofs.

Such roofs are not ordinarily required to hold rain water, slush, ice and snow for protracted periods. They are, however, subjected to longer periods of exposure to the harmful actinic rays of the sun, and should be constructed so as to provide complete protection under all prevailing conditions.

Roof Construction

Great care in construction and exacting inspection are desirable in steep roof work. The use of the proper materials and the proper application thereof are of paramount importance. Materials used in the construction of Barrett Built-Up Roofs for steep surfaces are particularly suited to the requirements involved. Applied, they form a continuous waterproofing membrane which will not slide or rupture under normal deck stress or strain.

Under no circumstances should membrane coverings be left unprotected or exposed to the weather. For this reason, consistent with Barrett's policy of providing the most durable weathering surface, Barrett's steep roof construction is protected by crushed slag or gravel, or by mineralized aggregate obtainable in a variety of colors.

Application

Barrett's approved roofing organization is skilled in the application of steep roof construction, and can be relied upon to handle this type of work with the same degree of efficiency as is obtained on all Barrett Specification work.

The specifications in this section are recommended for use under the specific conditions as outlined.

BARRETT STEEP ROOF PITCH

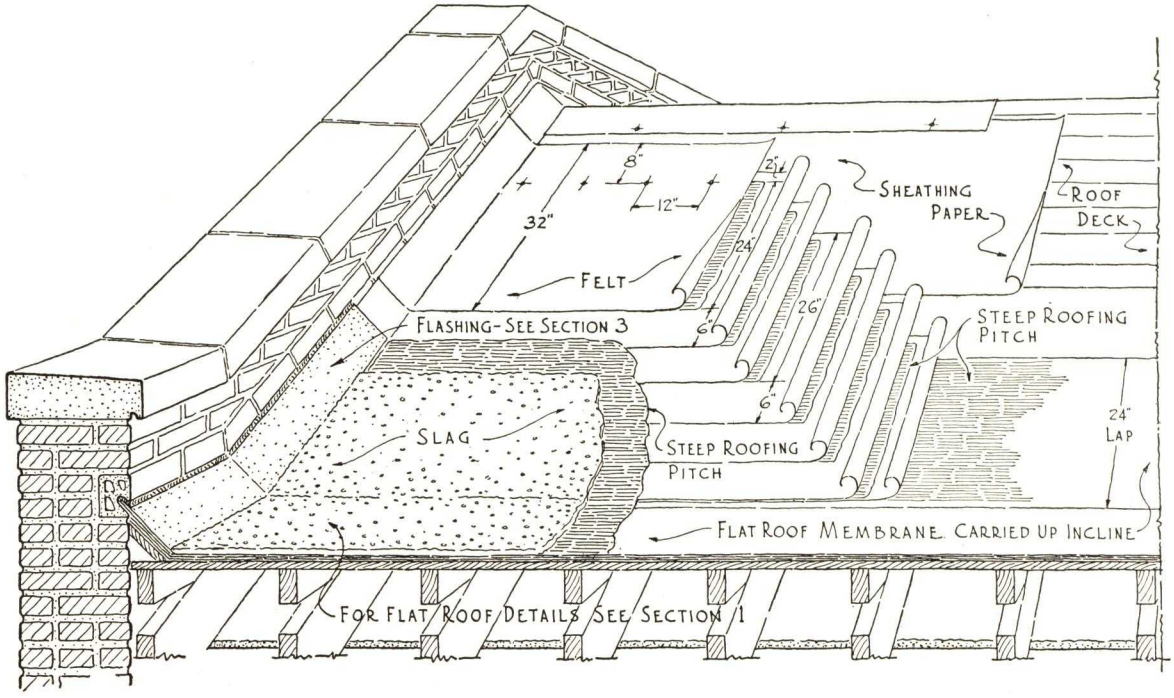
A Revolutionary, New Building Product

Barrett Steep Roof Pitch combines with **unusual stability** all the unmatched **waterproofing** and **weatherproofing** characteristics of coal tar pitch. The development of this revolutionary, new building product makes coal tar pitch, felt and gravel roofs possible on many types of buildings formerly denied this superior type of roof construction.

Practical installation experience under extreme conditions has demonstrated that Barrett Steep Roof Pitch does not slide or "bleed" at the highest temperatures to which roofs are subjected and does not crack or lose bond during extreme cold.

Roofs constructed of Barrett Steep Roof Pitch and Barrett Specification Felt with a fire-safe gravel or slag wearing surface, applied according to Barrett Specifications by Barrett Approved Roofers, are bonded by the United States Fidelity and Guaranty Company against repair and maintenance expense for 20 years.

FOR USE OVER—Wood Decks.
INCLINE—Over 2″ and not exceeding 6″ to 1′-0″.
Bonded for 20 Years—5 Ply Construction.



20 YEAR BOND BARRETT SPECIAL STEEP ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Special Steep Roof, and shall be laid in accordance with the Barrett Specification (for use over boards on steep surfaces), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for twenty (20) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knot-holes, and shall be firm, and free from loose material.

APPLICATION OF ROOFING—First—Lay one (1) thickness of sheathing paper or unsaturated felt weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheet at least one (1) inch. The sheathing paper shall be nailed sufficiently to hold it in place during application of the roofing.

Second—Over the entire surface lay five (5) plies of Barrett Specification Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-six (26) inches over preceding one. Each sheet shall be nailed with one (1) inch barbed roofing nails through flat tin discs, eight (8) inches from the upper edge and nails shall be spaced not more than one (1) foot apart.

Third—Mop back on each sheet for a distance of twenty-four (24) inches with Barrett Steep Roofing Pitch. The Felt shall follow and shall be firmly embedded into the hot moppings as applied. Care shall be taken that the Pitch moppings are even with lower edge of each overlying sheet, and that the finished Felt surface is free and clean of Pitch drippage.

Fourth—Over the entire surface, spread with a mop a uniform coating of Barrett Steep Roofing Pitch into which, while hot, firmly embed not less than two hundred and fifty (250) pounds of slag for each one hundred (100) square feet of finished roofing. The slag shall be from one-quarter (¼) to five-eighths (⅝) inch in size, shall be dry and free from dirt, and shall be embedded into the surface mopping immediately. If roofing is applied during cool weather, or slag is damp, slag shall be heated and dried, so that it is warm when applied to the roof. The slag surfacing shall be continuous and shall cover and shall be firmly embedded into the surface coating.

GENERAL—Felt shall be laid without wrinkles or buckles. Not less than eighty (80) pounds of Pitch shall be used for constructing the membrane, and not less than fifty (50) pounds nor more than sixty (60) pounds of Pitch shall be used for embedding the slag in constructing each one hundred (100) square feet of completed roof. The Pitch shall not be heated above four hundred (400) degrees Fahrenheit nor shall it be applied to the roof below three hundred fifty (350) degrees Fahrenheit.

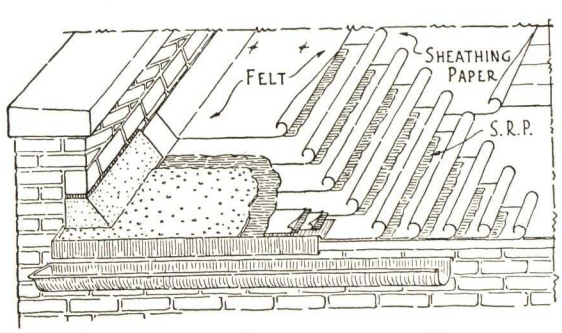
Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces, not less than twenty-four (24) inches before the application of the Steep Roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will issue its Guaranty Bond on jobs in the United States and Canada, where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification, and subject to Barrett inspection and approval under the following conditions:

(a) That the steep roof area shall be roofed in conjunction with the flat roof area.

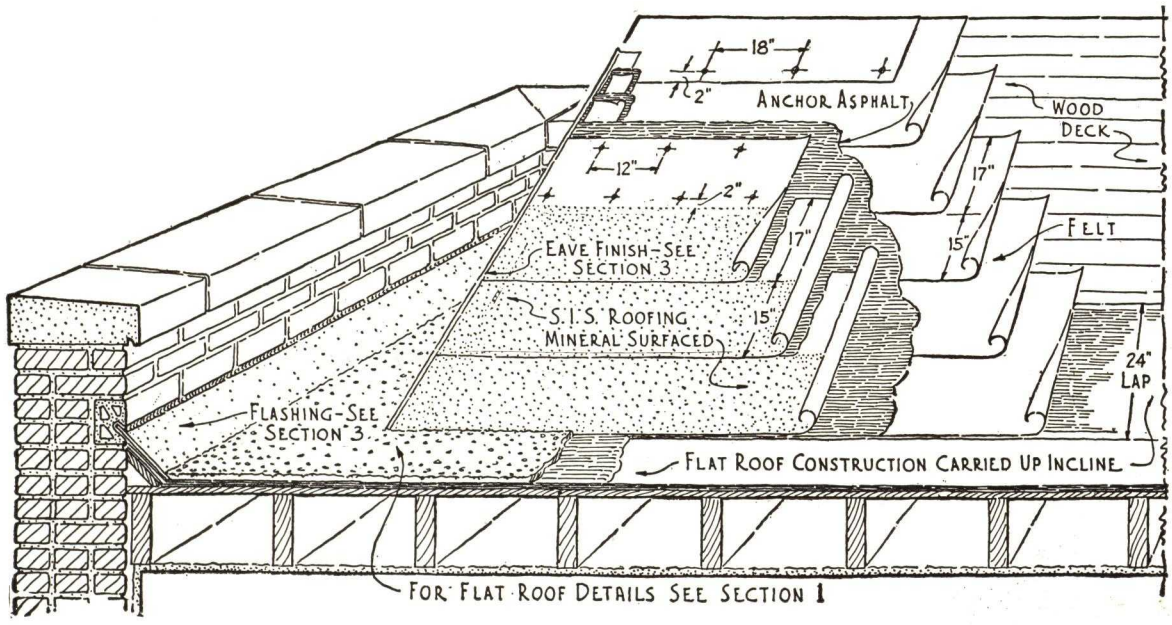
(b) That the flat roof area shall be covered with a Barrett Specification, Type "AA" or Type "A" roof.



METHOD OF STARTING AT EAVES

FOR USE OVER—Wood Decks.
INCLINE—Exceeding 4" to 1'-0".
TYPE S.I.S.—Bonded for 10 Years.

Barrett
SINCE 1854



10 YEAR BOND BARRETT SPECIAL STEEP ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Special Steep Roof, Type S. I. S., and shall be laid in accordance with the Barrett Specification (for use over boards on steep surfaces), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for ten (10) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knot holes, and free from loose material.

APPLICATION OF ROOFING—First—Over the entire surface lay two (2) plies of Barrett Specification Tarred Felt at right angles to the incline of the roof, lapping each sheet seventeen (17) inches over preceding one. Each sheet shall be nailed two (2) inches from the lower edge with barbed roofing nails, through flat tin discs, spacing the nails not more than eighteen (18) inches apart.

Second—Over the entire surface spread with a mop a uniform coating of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately rolled Barrett S. I. S. Roofing laid at right angles to the incline of the roof, lapping the sheets the full width of the seventeen (17) inch selvage. All sheets of Barrett S. I. S. Roofing shall be securely fastened in place with a double course of one (1) inch barbed roofing nails driven through flat tin discs, and placed along the selvage side of the sheet. Nailing courses to be staggered and nails to be spaced not more than twelve (12) inches apart. The lower nailing course shall be held back two (2) inches from the mineral surfacing.

Third—Spread over the entire surface of the seventeen (17) inch selvage a uniform mopping of Barrett Anchor Brand Roofing Asphalt or S. I. S. cement into which shall be immediately rolled the following sheet of Barrett S. I. S. Roofing.

Fourth—All end laps shall be over-lapped at least six (6) inches. The underlying sheet of each end lap shall be nailed with six (6) nails through flat tin discs spaced five (5) inches apart starting one (1) inch from the lower edge of the sheet. The six (6) inch lap shall be coated with Barrett Anchor Brand Roofing Asphalt or S. I. S. cement and the overlapping sheet thoroughly pressed down.

Fifth—The Barrett S. I. S. Roofing shall be cut in strips not to exceed twenty (20) feet in length and shall be stacked flat in piles at least twenty-four (24) hours before using.

GENERAL—The Felt and S. I. S. Roofing shall be laid without wrinkles or buckles. Not less than thirty (30) pounds of Anchor Asphalt per mopping or two (2) gallons of S. I. S. cement shall be used per one hundred (100) square feet of completed roofing.

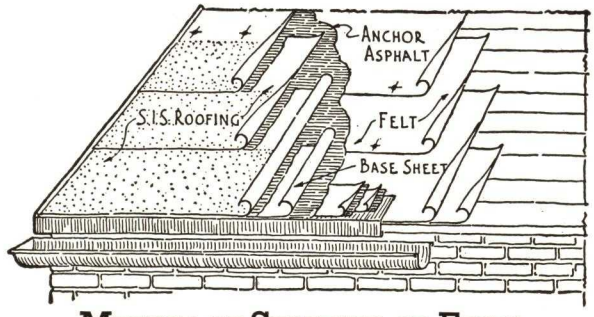
Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before the application of the steep roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of ten (10) years from date of completion in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will give its Guaranty Bond on jobs in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification and subject to Barrett inspection and approval under the following conditions:

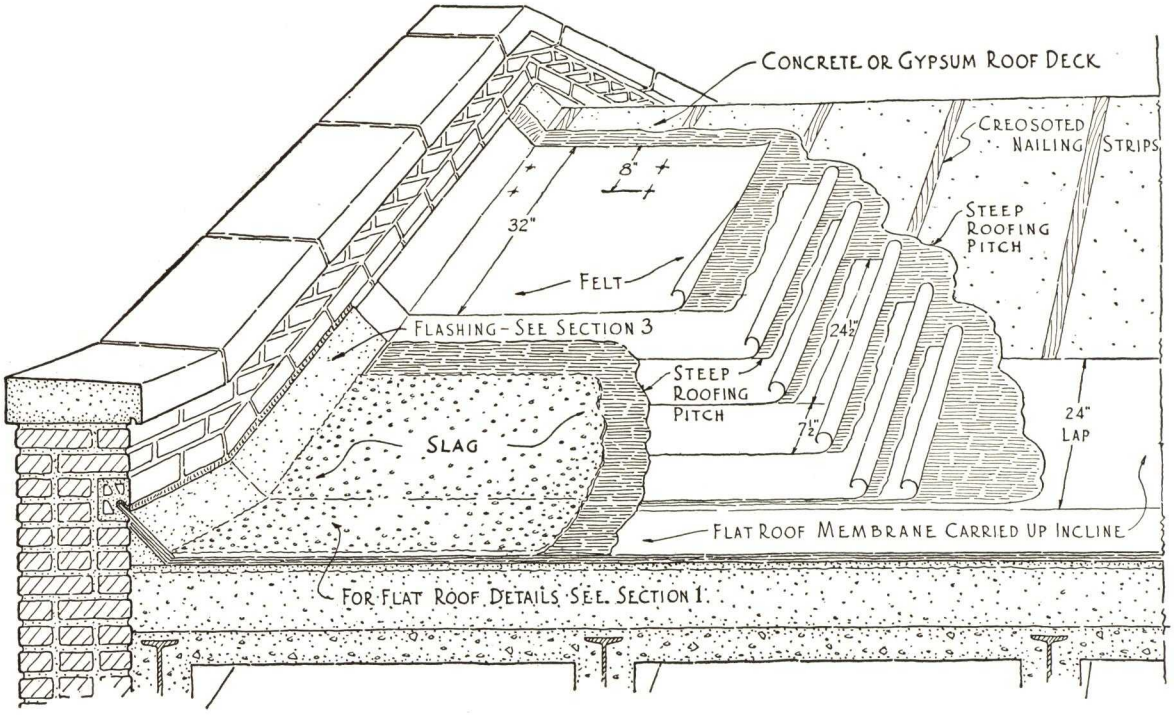
(a) That the steep roof area shall be roofed in conjunction with the flat roof area.

(b) That the flat roof area shall be covered with a Barrett Specification Type "A" or Type "AA" roof.



METHOD OF STARTING AT EAVES

FOR USE OVER—Poured Concrete or Poured Gypsum.
INCLINE—Over 2″ and not exceeding 6″ to 1′-0″.
Bonded for 20 Years—4 Ply Construction.



20 YEAR BOND BARRETT SPECIAL STEEP ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Special Steep Roof, and shall be laid in accordance with the Barrett Specification, for use over poured concrete or gypsum on steep surfaces by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY's Surety Bond Guaranty for twenty (20) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—The roof deck shall be smooth, firm, dry and free from loose material. The concrete or gypsum shall permit of nailing, or creosoted wooden nailing strips shall be provided. Where nailing strips are provided, they shall be laid parallel with the incline of the roof and shall be spaced not more than three (3) feet apart.

APPLICATION OF ROOFING—First—Coat the roof deck uniformly with Barrett Steep Roofing Pitch.

Second—Over the entire surface lay four (4) plies of Barrett Specification Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-four and one-half (24½) inches over preceding one. Each sheet shall be nailed with one (1) inch barbed roofing nails through flat tin discs, eight (8) inches from the upper edge, and nails shall be spaced not more than one (1) foot apart. Where nailing strips are used, the Felt shall be nailed with two (2) nails through flat tin discs (at each nailing strip) placed six (6) inches and eight (8) inches respectively from the upper edge of each sheet.

Third—Mop back on each sheet the full distance of the twenty-four and one-half (24½) inch lap with Barrett Steep Roofing Pitch. The Felt shall follow and shall be firmly embedded into the hot moppings as applied. Care shall be taken that pitch moppings are even with lower edge of each overlying sheet and that the finished Felt surface is clean and free from Pitch drippage.

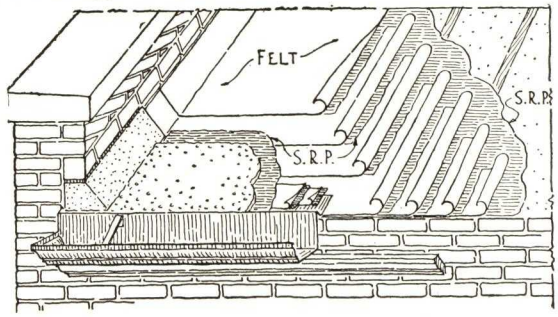
Fourth—Over the entire surface spread with a mop a uniform coating of Barrett Steep Roofing Pitch, into which, while hot, firmly embed not less than two hundred and fifty (250) pounds of slag for each one hundred (100) square feet of finished roofing. The slag shall be from one-quarter (¼) to five-eighths (⅝) inch in size, shall be dry and free from dirt, and shall be embedded into the surface mopping immediately. If roofing is applied during cool weather, or slag is damp, slag shall be heated and dried, so that it is warm when applied to the roof. The slag surfacing shall be continuous, and shall cover and shall be firmly embedded in the surface coating.

GENERAL—Felt shall be laid without wrinkles or buckles. Not less than one hundred (100) pounds of Pitch shall be used for constructing the membrane and not less than fifty (50) pounds nor more than sixty (60) pounds of Pitch shall be used for embedding the slag in constructing each one hundred (100) square feet of completed roof. The Pitch shall not be heated above four hundred (400) degrees Fahrenheit and shall not be applied to the roof below three hundred and fifty (350) degrees Fahrenheit.

Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the incined surfaces not less than twenty-four (24) inches before the application of the Steep Roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY's Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion in accordance with Note No. 1.

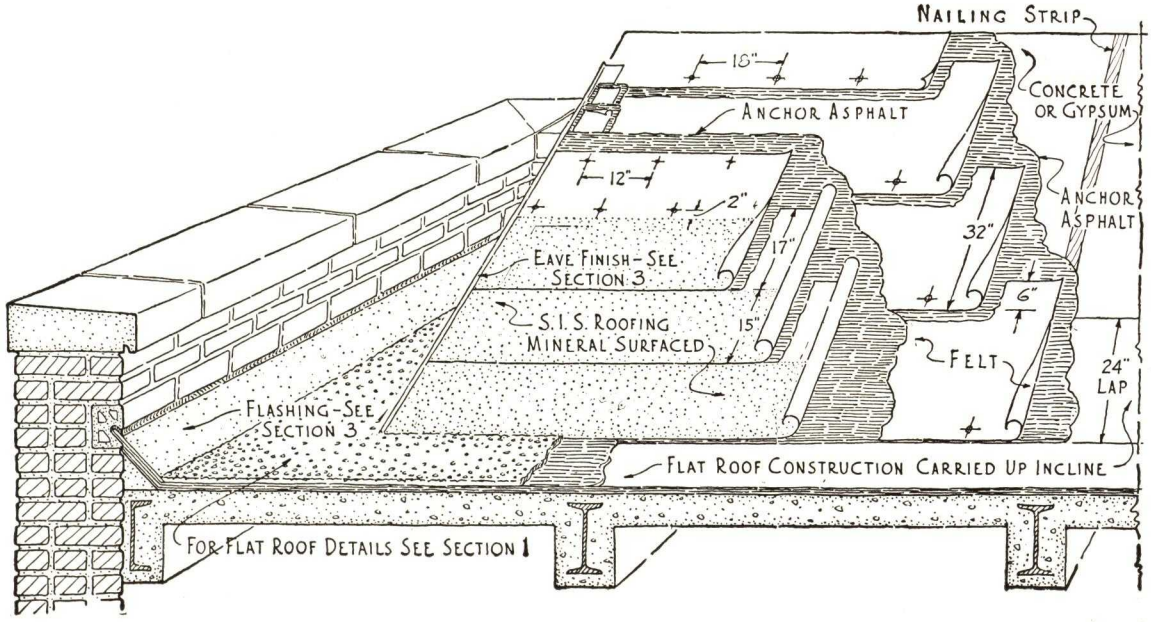
Note No. 1—THE BARRETT COMPANY will issue its Guaranty Bond on jobs in the United States and Canada, where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification, and subject to Barrett inspection and approval under the following conditions:
(a) That the steep roof area be roofed in conjunction with flat roof area.
(b) That the flat roof area shall be covered with a Barrett Specification Type "AA" or Type "A" roof.



METHOD OF STARTING AT EAVES

FOR USE OVER—Poured Concrete or Poured Gypsum.
INCLINE—Exceeding 4" to 1'-0".
TYPE S.I.S.—Bonded for 10 Years.

Barrett SINCE 1854



10 YEAR BOND BARRETT SPECIAL STEEP ROOF

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Special Steep Roof, Type S. I. S., laid in accordance with the Barrett Specification (for use over poured concrete or gypsum) by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty for ten (10) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—The roof deck shall be smooth, firm, dry and free from loose material. The concrete or gypsum shall permit of nailing, or creosoted wooden nailing strips shall be provided. If nailing strips are provided, they shall be laid parallel with the incline of the roof and shall be spaced not more than three (3) feet apart.

APPLICATION OF ROOFING—First—The surface of the roof deck shall be given a priming coat of Barrett Crystal Asphalt Primer. The priming coat shall be allowed to dry for not less than six (6) hours before the application of the roofing.

Second—Over the roof deck spread with a mop a uniform coating of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately embedded one (1) ply of Barrett Specification Tarred Felt, laid at right angles to the incline of the roof, lapping each sheet six (6) inches over preceding one. The six (6) inch overlap shall be thoroughly cemented together with Barrett Anchor Brand Roofing Asphalt. The Felt shall be nailed two (2) inches from the lower edge of each sheet, with barbed roofing nails through flat tin discs, spaced not more than eighteen (18) inches apart.

Third—Over the entire surface spread a uniform, mopped coating of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately rolled Barrett S. I. S. Roofing laid at right angles to incline of roof, lapping the sheets the full width of the seventeen (17) inch selvage. All sheets of S. I. S. Roofing shall be securely fastened in place with a double course of one (1) inch barbed roofing nails driven through flat tin discs, and placed along the selvage side of sheet. Nailing courses to be staggered and nails spaced not more than twelve (12) inches apart. Lower nailing course shall be held back two (2) inches from the mineral surfacing.

Fourth—Spread over the entire surface of the seventeen (17) inch selvage, a uniform mopping of Barrett Anchor Brand Roofing Asphalt or S. I. S. cement into which shall be immediately rolled the following sheet of S. I. S. Roofing.

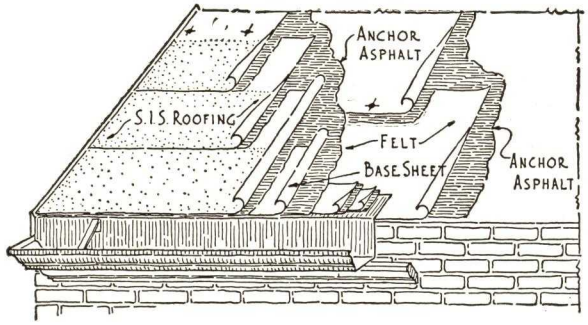
Fifth—All end laps shall be over-lapped at least six (6) inches. The underlying sheet of each end lap shall be nailed along end of sheet with six (6) nails through flat tin discs spaced evenly. The six (6) inch lap shall be coated with Barrett Anchor Brand Roofing Asphalt or S. I. S. cement and the overlapping sheet thoroughly pressed down.

Sixth—S. I. S. Roofing shall be cut in strips not to exceed twenty (20) feet in length and shall be stacked flat in piles at least twenty-four (24) hours before using.

GENERAL—The Felt and S. I. S. Roofing shall be laid without wrinkles or buckles. Not less than thirty (30) pounds of Anchor Asphalt per mopping or two (2) gallons of S. I. S. cement shall be used per one hundred (100) square feet of completed roofing. Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before the application of the steep roofing.

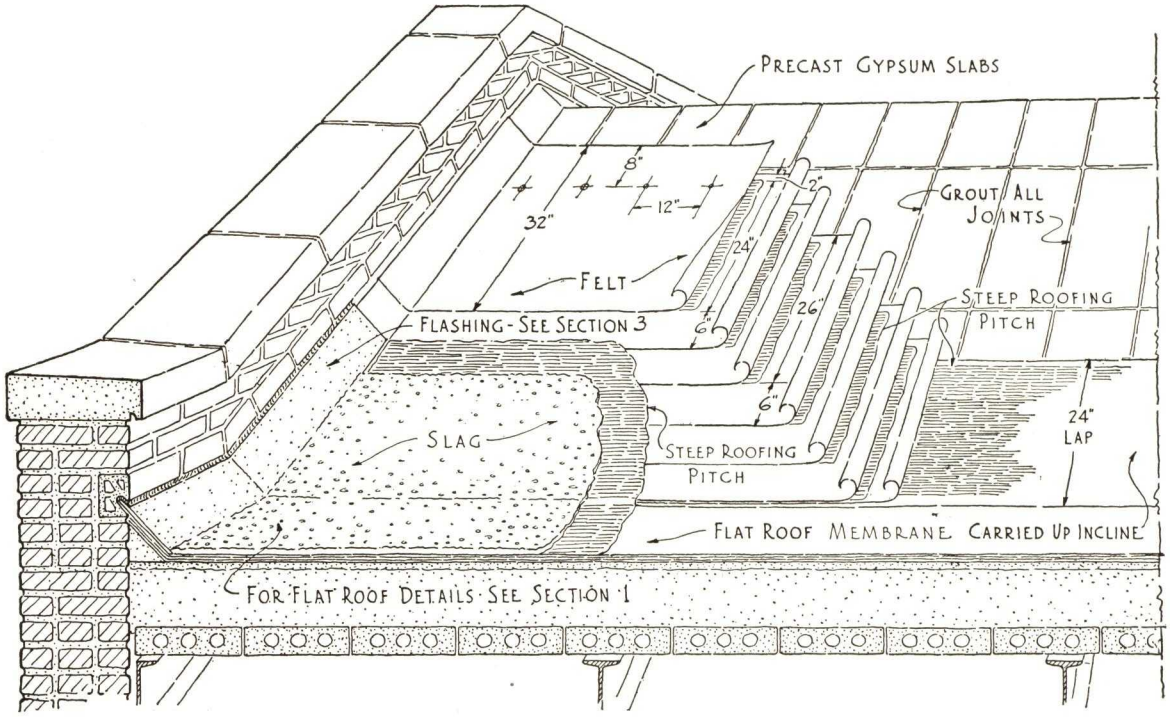
The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY'S Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Company of Baltimore, covering a period of ten (10) years from date of completion.

Note No. 1—THE BARRETT COMPANY will give its Guaranty Bond on jobs in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification, and subject to Barrett inspection and approval under the following conditions:
(a) That the steep roof area shall be roofed in conjunction with the flat roof area.
(b) That the flat roof area shall be covered with a Barrett Specification, Type "A" or Type "AA" roof.



METHOD OF STARTING AT EAVES

FOR USE OVER—Precast Concrete and Precast Gypsum Slabs.
INCLINE—Over 2″ and not exceeding 6″ to 1′-0″.
Bonded for 20 Years—5 Ply Construction.



20 YEAR BOND BARRETT SPECIAL STEEP ROOF

For Precast Concrete Slab Decks, provision shall be made for Nailing Strips set parallel with incline of roof and spaced not more than three (3) feet apart.

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Special Steep Roof, and shall be laid in accordance with the Barrett Specification for use over precast gypsum or concrete slabs over steep surfaces, by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY's Surety Bond Guaranty for twenty (20) years from date of completion, in accordance with Note No. 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—All joints between precast gypsum or concrete slabs shall be fully grouted. The roof deck shall be smooth, firm, dry and free from loose material.

APPLICATION OF ROOFING—First—Over the entire surface lay five (5) plies of Barrett Specification Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-six (26) inches over preceding one. Each sheet shall be nailed with one and one-half (1½) inch barbed roofing nails, through flat tin discs, eight (8) inches from the upper edge, nails to be spaced not more than one (1) foot apart.

Second—Mop back on each sheet for a distance of twenty-four (24) inches with Barrett Steep Roofing Pitch. The Felt shall follow and shall be firmly embedded into the hot moppings as applied. Care shall be taken that pitch moppings are even with lower edge of each overlying sheet, and that the finished Felt surface shall be free of drippage.

Third—Over the entire surface spread with a mop a uniform coating of Barrett Steep Roofing Pitch, into which, while hot, firmly embed not less than two hundred and fifty (250) pounds of slag for each one hundred (100) square feet of finished roofing. The slag shall be from one quarter (¼) to five-eighths (⅝) inch in size, shall be dry and free from dirt, and shall be embedded into the surface mopping immediately. If roofing is applied during cool weather, or slag is damp, slag shall be heated and dried, so that it is warm when applied to the roof. The slag surfacing shall be continuous, and shall cover and shall be firmly embedded into the surface coating.

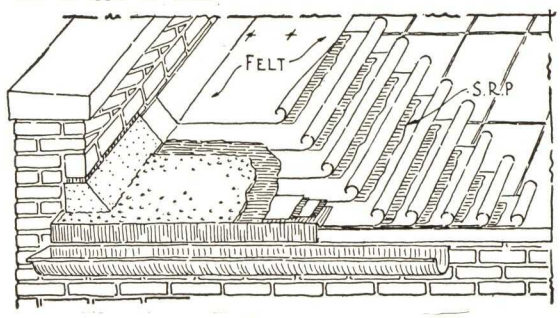
GENERAL—Felt shall be laid without wrinkles or buckles. Not less than eighty (80) pounds of Pitch shall be used for constructing the membrane, and not less than fifty (50) nor more than sixty (60) pounds of Pitch shall be used for embedding the slag in constructing each one hundred (100) square feet of completed roof. The Pitch shall not be heated above four hundred (400) degrees Fahrenheit nor shall it be applied to the roof below three hundred and fifty (350) degrees Fahrenheit.

Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before the application of the steep roofing. The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY's Surety Bond Guaranty issued by the U. S. Fidelity and Guaranty Company of Baltimore, covering a period of twenty (20) years from date of completion in accordance with Note No. 1.

Note No. 1—THE BARRETT COMPANY will issue its Guaranty Bond on jobs in the United States, where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification, and subject to Barrett inspection and approval under the following conditions:

(a) That the steep roof area shall be roofed in conjunction with the flat roof area.

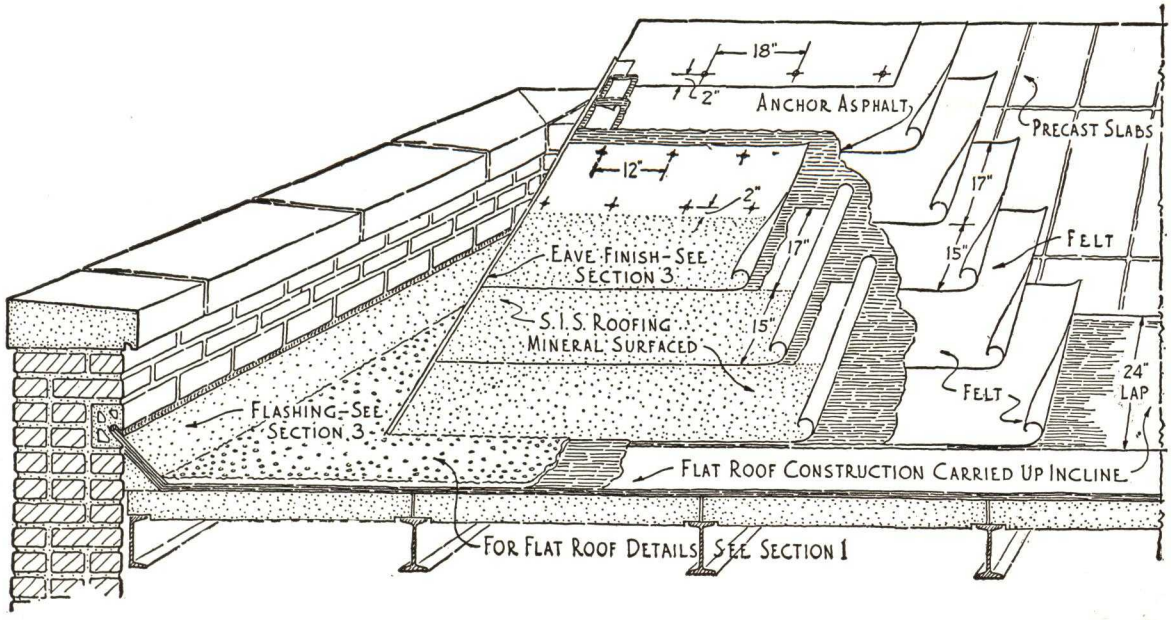
(b) That the flat roof area shall be covered with a Barrett Specification Type "AA" or Type **"A" roof.**



METHOD OF STARTING AT EAVES

FOR USE OVER—Precast Concrete and Precast Gypsum Slabs.
INCLINE—Exceeding 4″ to 1′-0″.
TYPE S.I.S.—Bonded for 10 Years.

Barrett SINCE 1854



10 YEAR BOND BARRETT SPECIAL STEEP ROOF

For Precast Concrete Slab Decks, provision shall be made for Nailing Strips set parallel with incline of roof and spaced not more than three (3) feet apart.

CONDENSED SPECIFICATION

ROOFING—Shall be a Barrett Special Steep Roof, Type S. I. S., laid in accordance with the Barrett Specification (for use over pre-cast concrete or pre-cast gypsum slabs), by a roofing contractor approved by THE BARRETT COMPANY. The roofing contractor shall furnish THE BARRETT COMPANY's Surety Bond Guaranty for ten (10) years from date of completion, in accordance with Note 1 of said specification.

COMPLETE SPECIFICATION

PREPARATION OF DECK—All joints between precast gypsum slabs shall be properly grouted. The roof deck shall be smooth, firm, dry and free from loose material. The gypsum or concrete shall permit of nailing or creosoted wooden nailing strips shall be provided. If nailing strips are provided, they shall be parallel with the incline of the roof and spaced not more than three (3) feet apart.

APPLICATION OF ROOFING—First—Over the entire surface lay two (2) plies of Barrett Specification Tarred Felt at right angles to the incline of roof, lapping each sheet seventeen (17) inches over preceding one. Each sheet shall be nailed two (2) inches from lower edge with barbed roofing nails, through flat tin discs, spaced not more than eighteen (18) inches.

Second—Over the entire surface spread with a mop a uniform coating of Barrett Anchor Brand Roofing Asphalt, into which, while hot, shall be immediately rolled Barrett S. I. S. Roofing laid at right angles to the incline of the roof, lapping the sheets the full width of the seventeen (17) inch selvage. All sheets of Barrett S. I. S. Roofing shall be securely fastened in place with a double course of one and one-half (1½) inch barbed roofing nails driven through flat tin discs, and placed along the selvage side of the sheet. Nailing courses to be staggered and nails to be spaced not more than twelve (12) inches apart. The lower nailing course shall be held back two (2) inches from the mineral surfacing.

Third—Spread over the entire surface of the seventeen (17) inch selvage a uniform mopping of Barrett Anchor Brand Roofing Asphalt or S. I. S. cement, into which, shall be immediately rolled the following sheet of Barrett S. I. S. Roofing.

Fourth—All end laps shall be over-lapped at least six (6) inches. The underlying sheet of each end lap shall be nailed with six (6) nails through flat tin discs spaced five (5) inches apart starting one (1) inch from the lower edge of the sheet. The six (6) inch lap shall be coated with Barrett Anchor Brand Roofing Asphalt or S. I. S. cement and the over-lapping sheet thoroughly pressed down.

Fifth—The Barrett S. I. S. Roofing shall be cut in strips not to exceed twenty (20) feet in length and shall be stacked flat in piles at least twenty-four (24) hours before using.

GENERAL—The felt and S. I. S. Roofing shall be laid without wrinkles or buckles. Not less than thirty (30) pounds of Anchor Asphalt per mopping or two (2) gallons of S. I. S. cement shall be used per one hundred (100) square feet of completed roofing.

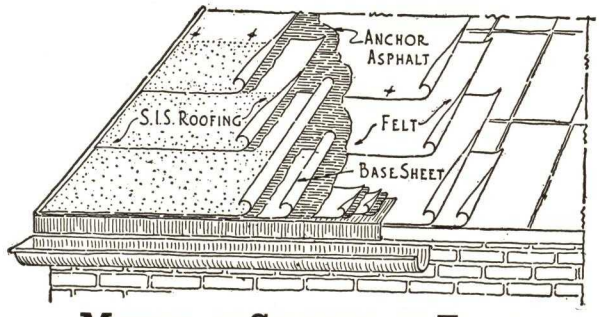
Where steep roofs join flat roofs, the roofing on the flat surfaces shall be carried up the inclined surfaces not less than twenty-four (24) inches before the application of the steep roofing.

The roof shall be applied by a roofing contractor approved by THE BARRETT COMPANY. He shall furnish THE BARRETT COMPANY's Surety Bond Guaranty issued by the U. S. Fidelity & Guaranty Co. of Baltimore, covering a period of ten (10) years from date of completion.

Note No. 1—THE BARRETT COMPANY will give its Guaranty Bond on jobs in the United States and Canada where its inspection service is available, provided the roof is applied by a roofing contractor approved by THE BARRETT COMPANY in strict accordance with the above specification, and subject to Barrett inspection and approval under the following conditions:

(a) That the steep roof area shall be roofed in conjunction with the flat roof area.

(b) That the flat roof area shall be covered with a Barrett Specification Type "A" or Type "AA" Roof.

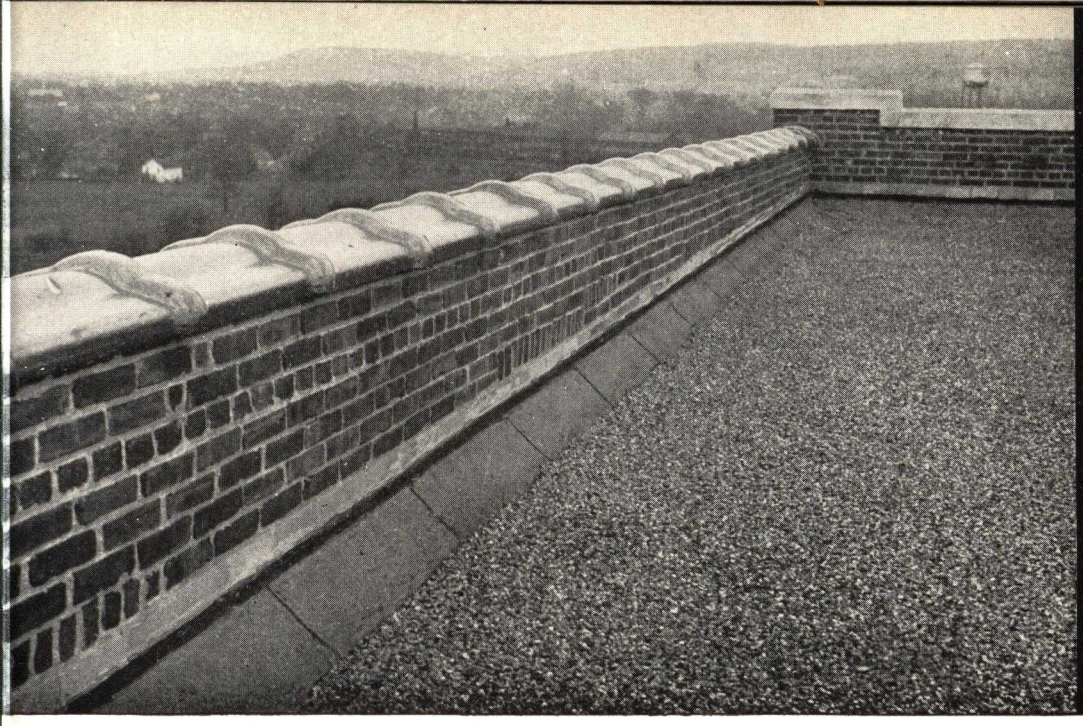


METHOD OF STARTING AT EAVES

BARRETT SPECIAL STEEP ROOFS

RISE OR INCLINE OF ROOFS PER FOOT; INCREASED AREA PER SQUARE FOOT OF STEEP ROOFS OVER FLAT ROOFS

Classification	Incline			Inclined Area Per Sq. Foot Horizontal Area	Percentage Increase In Area Over Flat Roof
	Inch Per Foot Horizontal	Angle With Horizontal	Fractional Factor		
Flat Roofs	⅛	0°-36′		1.000	0.0
	¼	1°-12′		1.000	0.0
	⅜	1°-47′		1.000	0.0
	½	2°-23′	1/48	1.001	0.1
	⅝	2°-59′		1.001	0.1
	¾	3°-35′	1/32	1.002	0.2
	1	4°-46′	1/24	1.003	0.3
	1⅛	5°-21′		1.004	0.4
	1¼	5°-57′		1.005	0.5
	1½	7°-8′	1/16	1.008	0.8
	1¾	8°-18′		1.011	1.1
	2	9°-28′	1/12	1.014	1.4
Steep Roofs	2¼	10°-37′		1.017	1.7
	2½	11°-46′		1.021	2.1
	2¾	12°-54′		1.026	2.6
	3	14°-2′	⅛	1.031	3.1
	3¼	15°-9′		1.036	3.6
	3½	16°-16′		1.042	4.2
	3¾	17°-21′		1.048	4.8
	4	18°-26′	1/6	1.054	5.4
	4¼	19°-30′		1.061	6.1
	4½	20°-34′		1.068	6.8
	5	22°-37′		1.083	8.3
	6	26°-34′	¼	1.118	11.8
	7	30°-16′		1.158	15.8
	8	33°-42′	1/3	1.202	20.2
	9	36°-52′		1.250	25.0
	10	39°-48′		1.302	30.2
	11	42°-31′		1.356	35.6
	12	45°-0′	½	1.414	41.4
Extra Steep Roofs	14	49°-24′		1.537	53.7
	16	53°-8′		1.667	66.7
	18	56°-19′		1.803	80.3
	20	59°-2′		1.943	94.3
	22	61°-23′		2.088	108.8
	24	63°-26′	1	2.235	123.5



SECTION 3

BARRETT ROOF and SPANDREL FLASHINGS

THE MOST VULNERABLE PART IN ANY ROOF

Purpose

The prevention of seepage or leaks at masonry walls of the modern building is a serious problem confronting every architect, engineer and builder.

These troubles are frequently traced to faulty flashing construction. Low spots where snow, ice, and rain water concentrate, are usually found along parapet walls, curbs, or other places where flashings are installed. Inadequate or faulty construction at these vital points opens the way to troublesome leaks and costly repairs.

Barrett Bonded Flashings

The Barrett system of flashing is considered a component part of the roof construction. The waterproof membrane is definitely tied in with the parapet wall by means of the flashing block. This part of the roof is reinforced, the added protection actually making it the strongest part of the roof. The flashing is flexible, and permits of movement occasioned by settlement of the deck, or by expansion and contraction in materials.

Eliminates Divided Responsibility

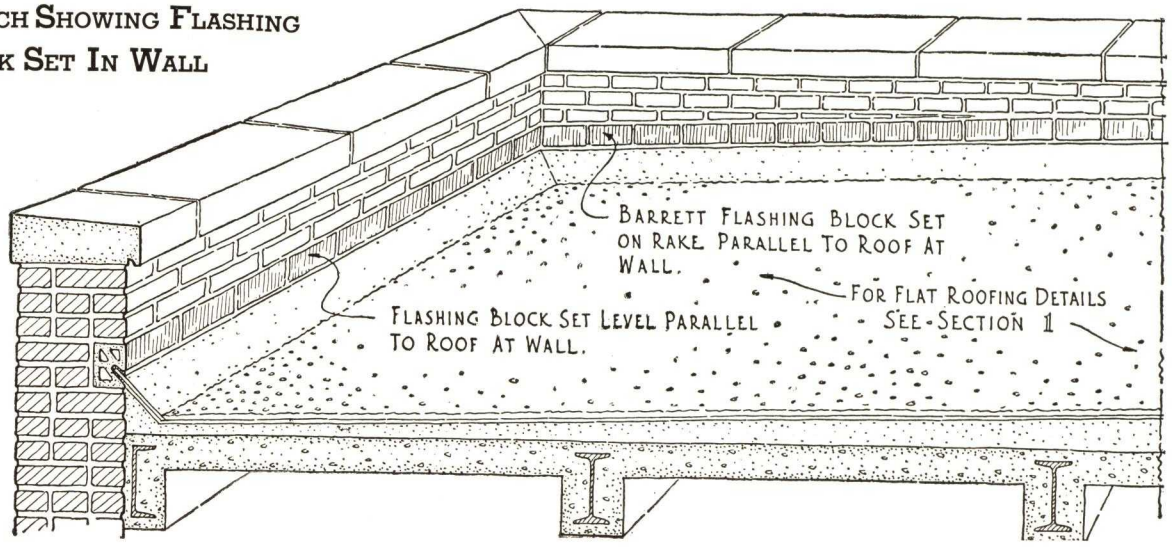
The Barrett system, used in conjunction with Barrett Specification Roofs, definitely eliminates troublesome flashing leaks at parapets, curbs, chimneys, fire-walls, etc. The responsibility for the complete roof, including flashing construction, rests with the Barrett approved roofer. The flashing is installed by the roofing contractor at the same time he applies the roofing, and its performance is fully covered in the guaranty bond.

A Good Roof Deserves Good Flashings

Good flashings promote the serviceability of good roofs. The Barrett flashing system, developed after years of practical experience, is a worthy companion to Barrett Specification Roofs. Time-tried under every conceivable condition, it is accepted generally as a standard type of construction for both flat and steep built-up roofs.

METHOD OF INSTALLING BARRETT FLASHING BLOCK IN BRICK WALLS

SKETCH SHOWING FLASHING BLOCK SET IN WALL



SPECIFICATION FOR INSTALLATION WITH VARIOUS TYPES OF ROOF DECKS

FOR MASONRY—Barrett Flashing Block shall be built into walls with the base of the block set five (5) inches above and parallel with the finished grade line of the roof at wall.

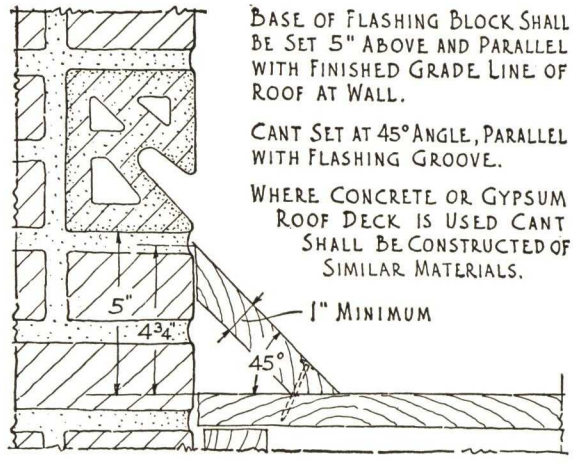
Blocks shall be laid in true alignment, set in Portland Cement Mortar, and joints shall be properly pointed. All end joints shall be solid mortar joints.

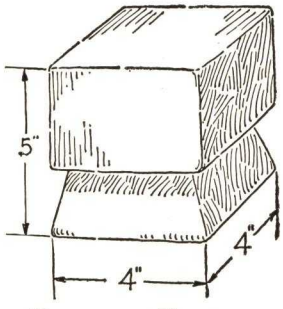
The flashing groove of the blocks shall be thoroughly cleaned of all surplus mortar.

Note—Special blocks are manufactured for use at right angle external and internal wall corners.

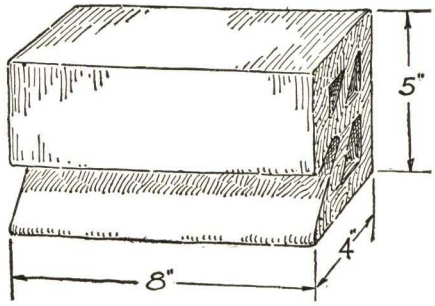
For Concrete or Gypsum Roof Deck—At angle of roof deck and the walls in which flashing block has been installed, provide a concrete cant that will permit of nailing, the upper edge of which shall terminate one-quarter (¼) inch below the flashing groove. The face of the cant shall have an incline of forty-five (45) degrees the same as the flashing groove in the block. The distance from the innermost end of flashing groove to bottom of cant strip shall not exceed ten (10) inches.

FOR CARPENTRY, BOARD ROOF DECK—At angle of roof deck and the walls in which flashing block has been installed, provide a wood cant at least one (1) inch thick, the upper edge of which shall terminate one-quarter (¼) inch below the flashing groove. The face of the cant shall have an incline of forty-five (45) degrees, the same as the flashing groove in the block. The cant shall be securely fastened to the roof deck. The distance from the innermost end of flashing groove to bottom of cant strip shall not exceed ten (10) inches.

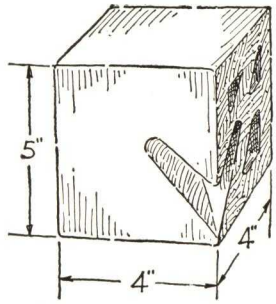




OUTSIDE CORNER



STRAIGHT FLASHING BLOCK

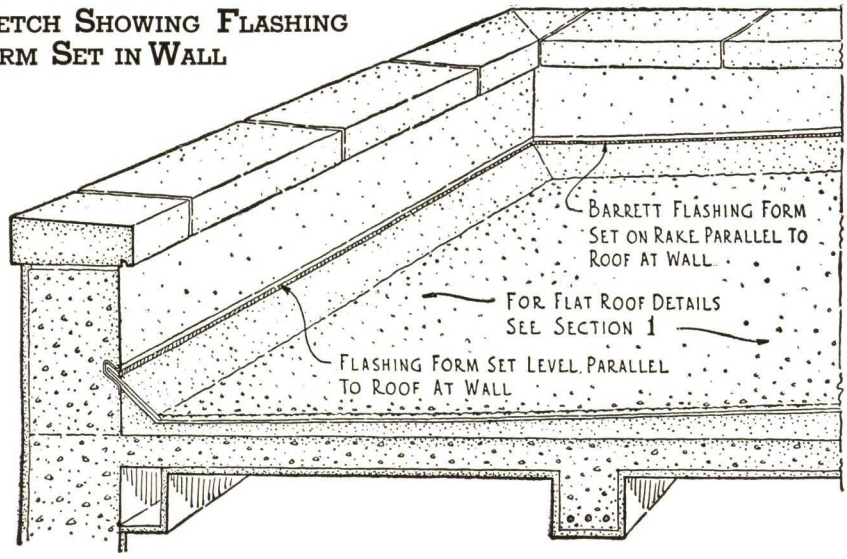


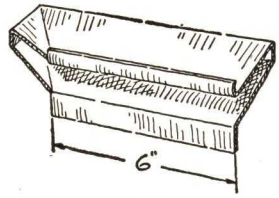
INSIDE CORNER

METHOD OF INSTALLING BARRETT FLASHING FORM IN CONCRETE WALLS

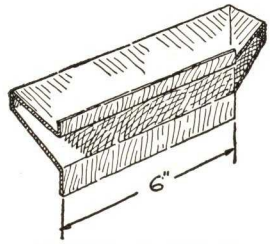
Barrett SINCE 1854

SKETCH SHOWING FLASHING FORM SET IN WALL





INSIDE RETURN LEFT HAND



INSIDE RETURN RIGHT HAND

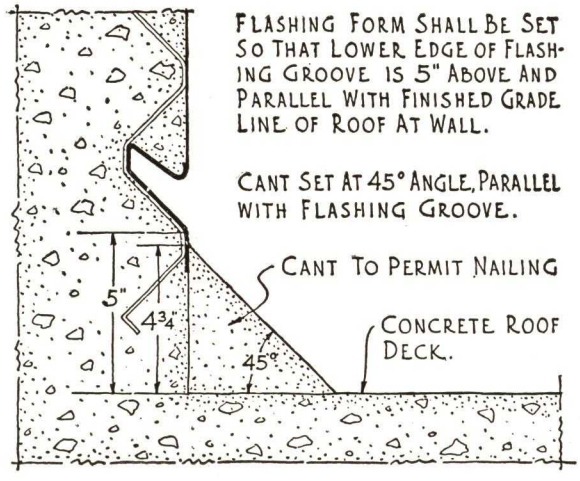
SPECIFICATION FOR INSTALLATION WITH CONCRETE ROOF DECKS

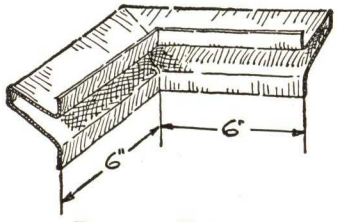
FOR CONCRETE—Barrett Flashing Form shall be attached to the inside of the wall form by means of metal strap brackets (so provided) spaced not more than two (2) feet apart and secured by one (1) inch smooth wire nails.

Barrett Flashing Form shall be set so that the lower edge of the flashing groove is five (5) inches above and parallel with the finished grade line of the roof at wall.

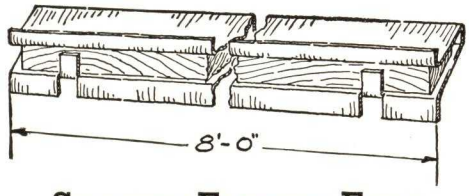
Note—Special mitred flashing forms are manufactured for use at right angle external and internal wall corners.

At angle of roof deck and the wall in which flashing form has been installed, provide a concrete cant that will permit of nailing, the upper edge of which shall terminate one-quarter (¼) inch below the flashing groove. The face of the cant shall have an incline of forty-five (45) degrees the same as the flashing groove in the block. The distance from the innermost end of flashing groove to bottom of cant strip shall not exceed ten (10) inches.

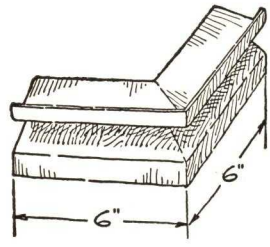




INSIDE CORNER

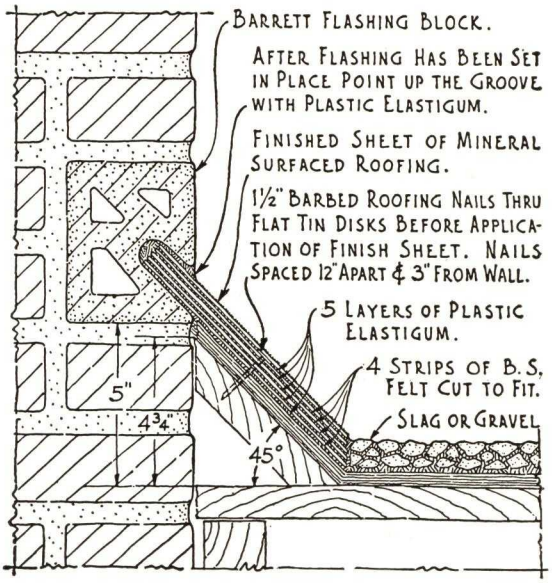


STRAIGHT FLASHING FORM

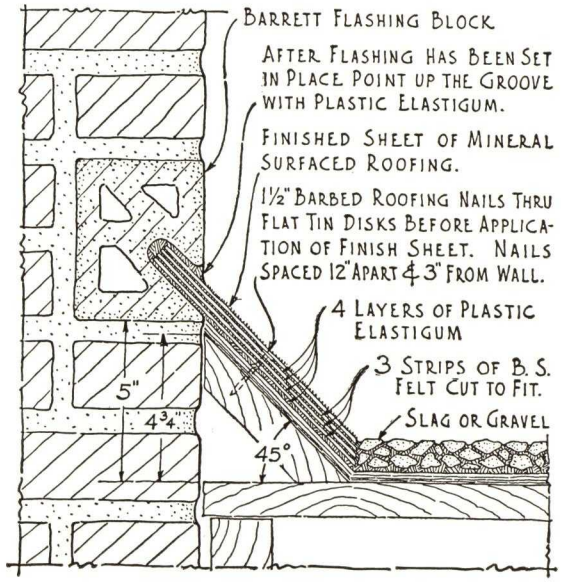


OUTSIDE CORNER

BARRETT FLASHING SYSTEM FOR BRICK WALLS
TYPE "AA"—Bonded for 20 Years.
TYPE "A"—Bonded for 15 Years.



BLOCK TYPE
FOR BRICK WALLS
20 YEAR BOND



BLOCK TYPE
FOR BRICK WALLS
15 YEAR BOND

20 YEAR BOND TYPE "AA" BARRETT FLASHING FOR BRICK WALLS

Note—This flashing shall be installed before gravel, slag, tile or other surfacing material is applied to the roof surface.

APPLICATION OF FLASHING—First—Before applying flashing material, the flashing groove shall be thoroughly cleaned of mortar or other foreign materials.

Second—The Felt and Pitch roofing shall be extended up the face of the cant to the wall line and cut off evenly at that point. The plies of Felt shall be solidly cemented together with Pitch and be free from wrinkles or buckles.

Third—Over the roofing, covering the cant, and up into the full depth of the flashing groove, apply a heavy uniform layer of Barrett Plastic Elastigum, into which embed one (1) ply of flashing strip, cut the proper width from a roll of Barrett Specification Felt. The sheets of the flashing strips shall be lapped one (1) inch and the strips shall extend into the full depth of the flashing groove. This operation shall be repeated until four (4) layers of Plastic Elastigum and four (4) plies of flashing strip have been applied. The fourth flashing strip shall be nailed every twelve (12) inches, three (3) inches from the wall with one and one-half (1½) inch barbed roofing nails through flat tin discs. Each flashing strip shall be set in separately (not folded) and shall break joints with the underlying ply.

Fourth—Over the entire surface of the flashing strips thus laid, apply a uniform trowelled coating of Plastic Elastigum. Care shall be taken so that a liberal amount of Plastic Elastigum is placed along the opening of the flashing groove. Into the Plastic Elastigum embed immediately a layer of Barrett Everlastic Mineral Surfaced Roofing of the proper width, extending into the full depth of the groove and down to the roofing. The strips of Mineral Surfaced Roofing shall be cut from across the roll so that the end of each strip shall have a two (2) inch selvage. The two (2) inch selvage shall be coated with Plastic Elastigum and shall be over-lapped by the following sheet of Mineral Surfaced Roofing and thoroughly pressed down. The flashing groove shall then be pointed up with Plastic Elastigum.

Note No. 1—IMPORTANT—No projections such as vent pipes, conductor lines or braces shall be constructed through the flashing cant. All such projections shall be placed through roof deck at a point not less than ten (10) inches from the intersection of cant with roof deck.

Note No. 2—THE BARRETT COMPANY will give its Guaranty Bond on jobs in the United States and Canada where its inspection service is available, provided the flashing is installed in strict accordance with the above specification and subject to Barrett inspection and approval under the following condition: That the flashing shall be installed during the application of a Barrett Bonded Roof.

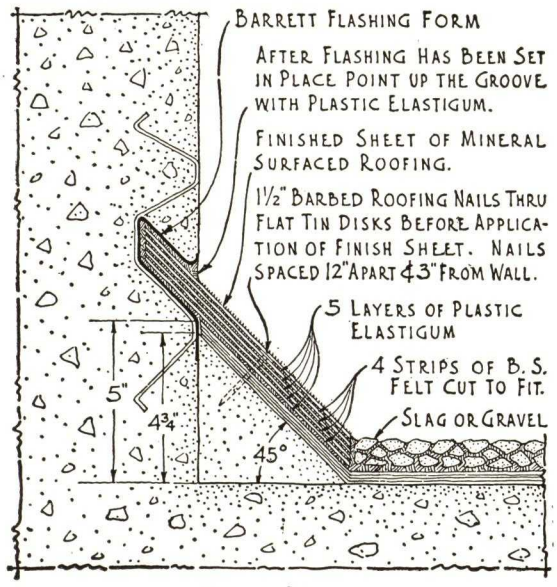
15 YEAR BOND TYPE "A" BARRETT FLASHING FOR BRICK WALLS

Same as above, except change the last half of paragraph headed "Third" as follows:

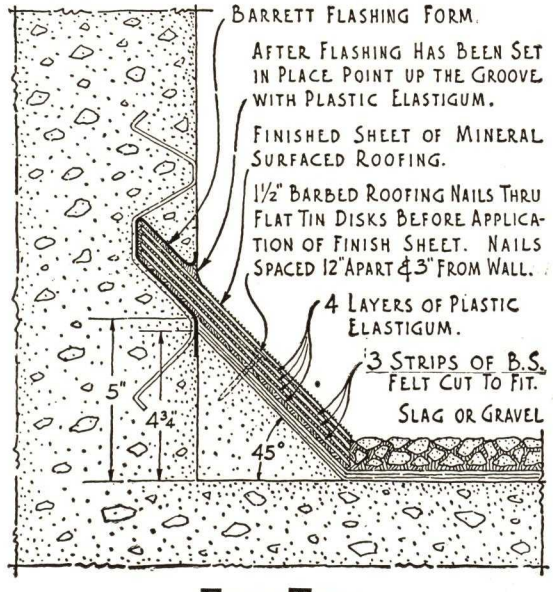
This operation shall be repeated until three (3) layers of Plastic Elastigum and three (3) plies of flashing strip have been applied. The third flashing strip shall be nailed every twelve (12) inches, three (3) inches from the wall with one and one-half (1½) inch barbed roofing nails through flat tin discs. Each flashing strip shall be set in separately (not folded) and shall break joints with the underlying ply.

BARRETT FLASHING SYSTEM FOR CONCRETE WALLS
TYPE "AA"—Bonded for 20 Years.
TYPE "A"—Bonded for 15 Years.

Barrett SINCE 1854



FORM TYPE
FOR CONCRETE WALLS
20 YEAR BOND



FORM TYPE
FOR CONCRETE WALLS
15 YEAR BOND

20 YEAR BOND TYPE "AA" BARRETT FLASHING FOR CONCRETE WALLS

Note—This flashing shall be installed before gravel, slag, tile or other surfacing material is applied to the roof surface.

APPLICATION OF FLASHING—First—Before applying flashing material, the flashing groove shall be thoroughly cleaned of mortar or other foreign materials.

Second—The Felt and Pitch roofing shall be extended up the face of the cant to the wall line and cut off evenly at that point. The plies of Felt shall be solidly cemented together with Pitch and be free from wrinkles or buckles.

Third—Over the roofing, covering the cant, and up into the full depth of the flashing groove, apply a heavy uniform layer of Barrett Plastic Elastigum, into which embed one (1) ply of flashing strip, cut the proper width from a roll of Barrett Specification Felt. The sheets of the flashing strips shall be lapped one (1) inch and the strips shall extend into the full depth of the flashing groove. This operation shall be repeated until four (4) layers of Plastic Elastigum and four (4) plies of flashing strip have been applied. The fourth flashing strip shall be nailed every twelve (12) inches, three (3) inches from the wall with one and one-half (1½) inch barbed roofing nails through flat tin discs. Each flashing strip shall be set in separately (not folded) and shall break joints with the underlying ply.

Fourth—Over the entire surface of the flashing strips thus laid, apply a uniform trowelled coating of Plastic Elastigum. Care shall be taken so that a liberal amount of Plastic Elastigum is placed along the opening of the flashing groove. Into the Plastic Elastigum embed immediately a layer of Barrett Everlastic Mineral Surfaced Roofing of the proper width, extending into the full depth of the groove and down to the roofing. The strips of Mineral Surfaced Roofing shall be cut from across the roll so that the end of each strip shall have a two (2) inch selvage. The two (2) inch selvage shall be coated with Plastic Elastigum and shall be over-lapped by the following sheet of Mineral Surfaced Roofing and thoroughly pressed down. The flashing groove shall then be pointed up with Plastic Elastigum.

Note No. 1—IMPORTANT—No projections such as vent pipes, conductor lines or braces shall be constructed through the flashing cant. All such projections shall be placed through roof deck at a point not less than ten (10) inches from the intersection of cant with roof deck.

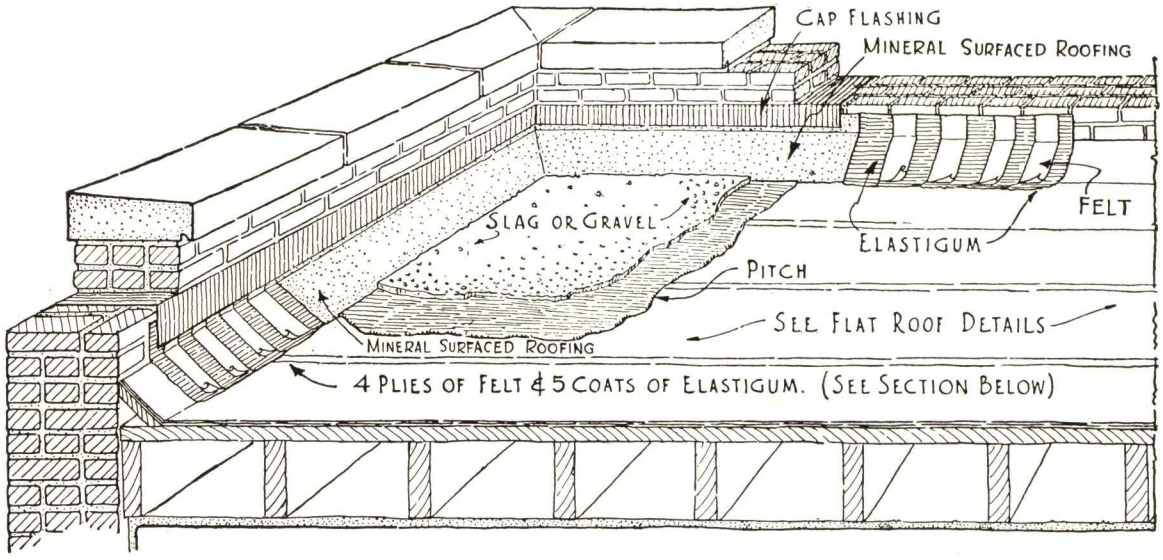
Note No. 2—THE BARRETT COMPANY will give its Guaranty Bond on jobs in the United States and Canada where its inspection service is available, provided the flashing is installed in strict accordance with the above specification and subject to Barrett inspection and approval under the following condition: That the flashing shall be installed during the application of a Barrett Bonded Roof.

15 YEAR BOND TYPE "A" BARRETT FLASHING FOR CONCRETE WALLS

Same as above, except change the last half of paragraph headed "Third" as follows:

This operation shall be repeated until three (3) layers of Plastic Elastigum and three (3) plies of flashing strip have been applied. The third flashing strip shall be nailed every twelve (12) inches, three (3) inches from the wall with one and one-half (1½) inch barbed roofing nails through flat tin discs. Each flashing strip shall be set in separately (not folded) and shall break joints with the underlying ply.

ALTERNATE TYPE "AA" FLASHINGS
Using Bituminous Base and Metal Counter Flashings



BARRETT SPECIFICATION, ALTERNATE TYPE "AA" FLASHINGS

SPECIFICATIONS

Note—Flashing shall be installed before gravel, slag, tile or other surfacing material is applied to the roof surface.

BASE FLASHING

The felt and pitch roofing shall be extended up the face of a cant, placed five (5) inches above roof line and extending to the roof deck on an angle of 45°, up to the wall line and cut off evenly at that point. The membrane shall be laid evenly and without wrinkles or buckles.

Over the roofing membrane covering the cant, apply a heavy uniform layer of Barrett Plastic Elastigum into which embed one (1) ply of flashing strips cut the proper width from Barrett Specification Felt. The sheets of the flashing strips shall be lapped one (1) inch and the strips shall extend on to the vertical wall for a distance of one (1) inch above the top of the cant.

This operation shall be repeated until four (4) layers of Plastic Elastigum and four (4) plies of flashing strips have been applied, each flashing strip stepped above the preceding strip, and on the wall, so that the last strip is immediately below the metal counter-flashing where it enters the wall. Each flashing strip shall be set in separately and shall break joints with the underlying strip. The strips shall then be nailed to the cant, using one and one-half (1½) inch barbed roofing nails through flat tin discs spaced twelve (12) inches on center.

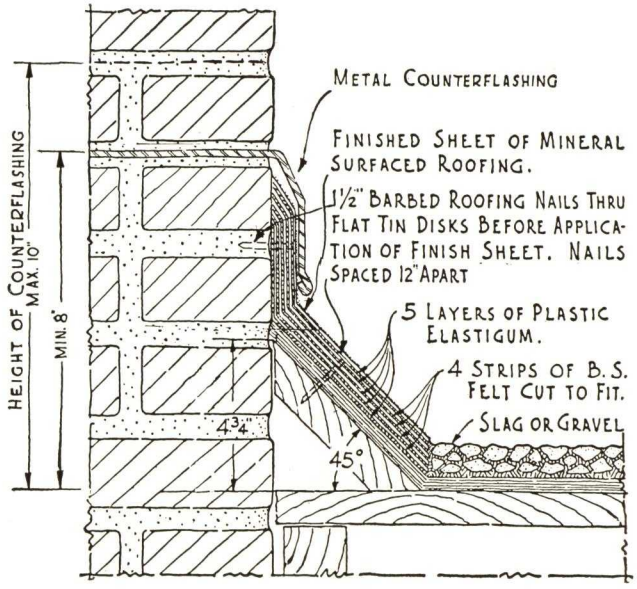
Over the entire surface of the flashing strip thus laid, apply a uniform trowel coat of Plastic Elastigum into which immediately embed a layer of Barrett Everlastic Mineral Surfaced Roofing of the proper width, extending from the base of the cant to immediately below where the metal counter-flashing enters the wall. The Mineral Surfaced Roofing shall be set in place firmly so that there are no buckles or loose sections. The strips of Mineral Surfaced Roofing shall be cut from across the roll so that the end of each strip shall have a two (2) inch selvage. The two (2) inch selvage shall be coated with Plastic Elastigum and shall be overlapped by the following sheet of Mineral Surfaced Roofing and thoroughly pressed down.

The base flashing shall then be nailed on eight (8) inch to twelve (12) inch centers at a point approximately two (2) inches below where the metal counter-flashing enters the wall, or in the mortar joints immediately below the joint into which the counter-flashing is set.

METAL COUNTER-FLASHING

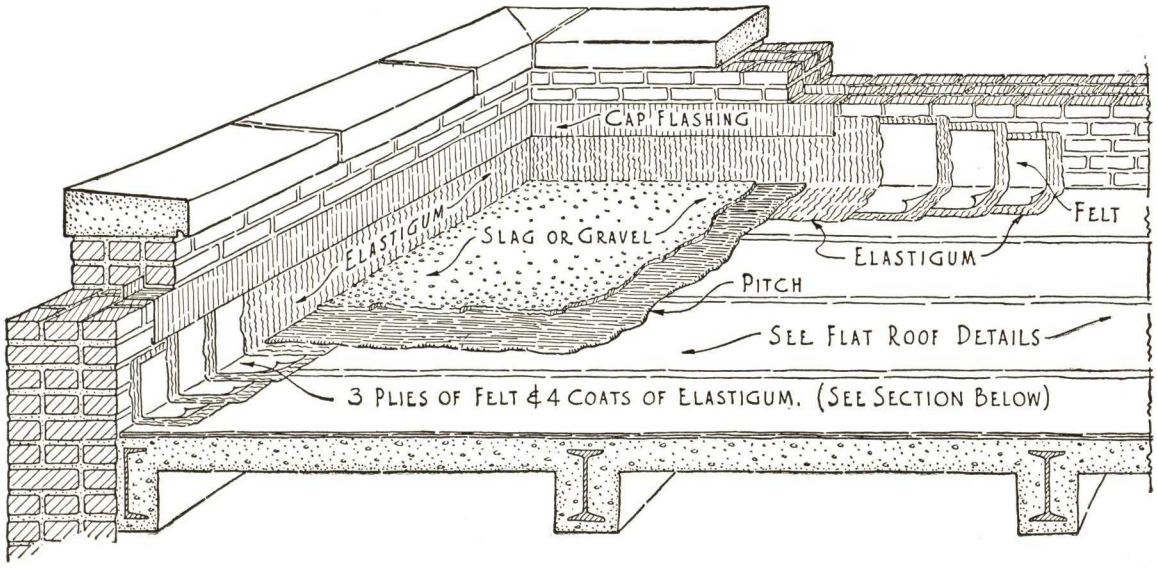
The metal counter-flashing shall overlap the bituminous base flashing to the junction of wall and cant surface, so that all flashing strips and nails are completely counter-flashed with the metal cap.

Note—No projections such as vent pipes, conductor lines or braces shall be constructed to the flashing cant. All such projections shall be placed thru roof deck at a point not less than ten (10) inches from the intersection of cant with roof deck, and shall be properly flashed.



PLASTIC ELASTIGUM FLASHINGS FOR BRICK OR CONCRETE WALLS. 10 Year Guaranty.

Barrett SINCE 1854



10 YEAR BARRETT PLASTIC ELASTIGUM FLASHING FOR BRICK OR CONCRETE WALLS

Note—If the roofing is laid over a board deck, the first two (2) plies of Felt shall be turned up against perpendicular surfaces at least four (4) inches. If the roofing is laid over a concrete deck, all plies shall be cut off evenly at the angle of the roof deck and parapet walls.

APPLICATION OF FLASHING—First—After all plies of roofing have been laid and preceding the application of the slag or gravel surface, apply a uniform trowelled coating of Barrett Plastic Elastigum for a distance of ten (10) inches up the parapet wall and six (6) inches out on the roofing into which shall be immediaetly embedded a ten (10) inch strip of Barrett No. 15 Asphalt Felt extending up the wall six (6) inches and out on the roofing four (4) inches.

Second—This strip shall be coated with Barrett Plastic Elastigum. Then follow with a second strip of Barrett No. 15 Asphalt Felt thirteen (13) inches wide extending eight (8) inches up the wall and five (5) inches out on the roof.

Third—This strip shall be coated with Barrett Plastic Elastigum into which embed a third strip of Barrett No. 15 Asphalt Felt sixteen (16) inches wide, extending ten (10) inches up the wall and six (6) inches out on the roof.

Fourth—This strip shall be coated uniformly with Barrett Plastic Elastigum. Care shall be taken so that the top edge of the felt strips shall be pressed firmly against the masonry wall and the Plastic Elastigum feathered against it.

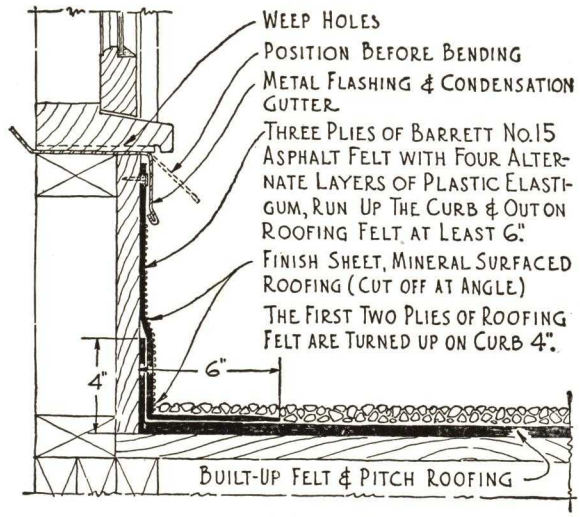
Felt strips shall not exceed ten (10) feet in length and shall be lapped at least one (1) inch and all joints broken so that each is covered by at least two (2) thicknesses of felt.

Where a cant is used, the width of the first sheet of felt installed shall be such that at least four (4) inches shall extend above top of the cant and four (4) inches out on the roof. Each succeeding strip shall follow the proportions, as specified above.

Note No. 1—THE BARRETT COMPANY will give its ten (10) year guaranty on jobs in the United States and Canada where its inspection service is available, provided the flashing is installed in strict accordance with the above specification and subject to Barrett inspection and approval under the following condition: That the flashing shall be installed during the application of a Barrett Bonded Roof.

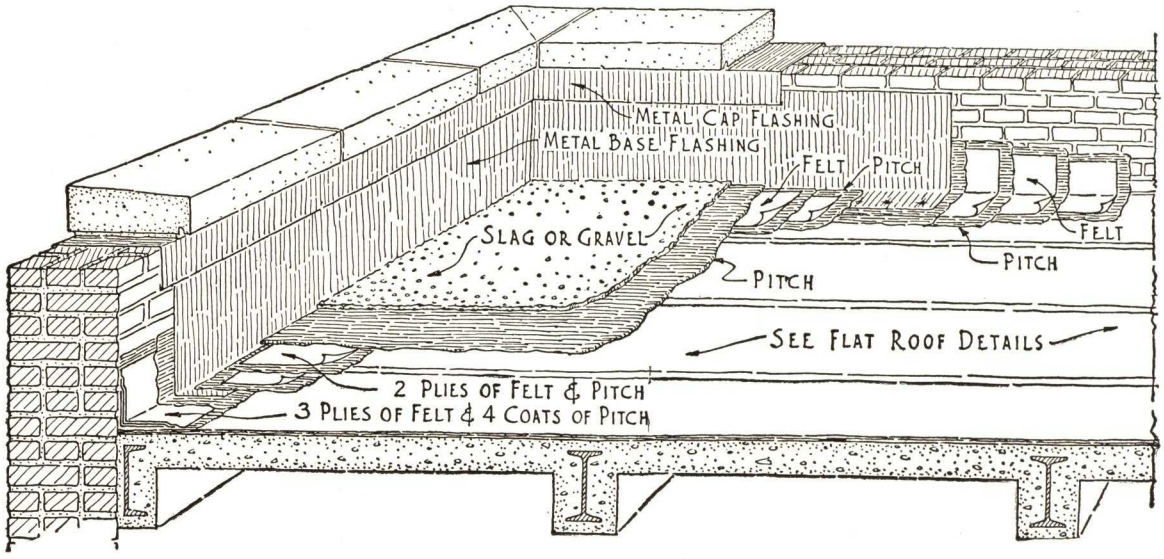
Architect's Note—The use of a metal counter flashing with this type of installation is optional with Architect, and if desired should be covered in specifications.

Where metal counter flashing is provided with this type of installation, and where specified, cap sheet of Barrett Everlastic Mineral Surfaced Roofing may be applied after Plastic Elastigum flashing has been installed in place. Cap sheet shall be cut off at roof line. End laps shall be at least two (2) inches, with under lap well fastened and coated with Plastic Elastigum.



DETAIL FOR CURB FLASHING

DETAILS FOR INSTALLING METAL CAP AND BASE FLASHING FOR MASONRY WALLS



SPECIFICATION

Note—Architect or engineer shall specify and describe kind of metal to be used for flashing.

Metal flashings shall be installed at all parapet walls, curbs, pent houses and other vertical surfaces as shown on plans.

CAP FLASHINGS—(1)—All cap flashings shall be set into brick walls for a distance of four (4) inches and turned up one (1) inch behind the first course of brick and down the face of the wall overlapping the base flashing at least two (2) inches. End laps shall be at least two (2) inches and soldered.

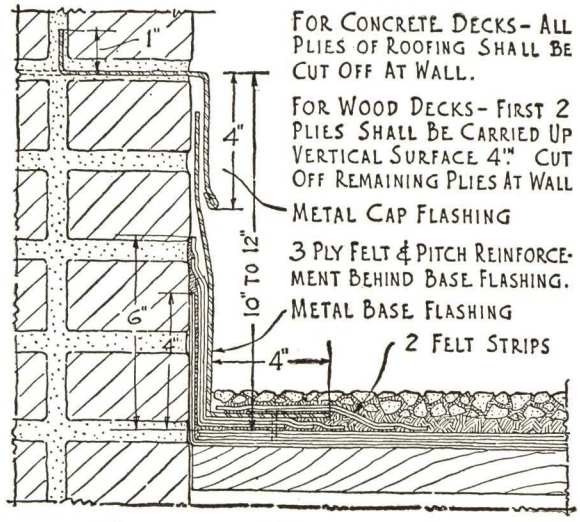
(2) Alternate Specification—Architect's Note—All cap flashings shall be set into brick walls and shall extend from inside face of wall to within one (1) inch of outside face, and down inside face of wall overlapping the base flashing at least two (2) inches. End laps shall be at least two (2) inches and soldered.

FELT AND PITCH REINFORCEMENT—After all plies of roofing have been laid, the roofing contractor shall set in separately, at the angle of the roof deck and vertical surface, three (3) plies of tarred felt cemented together with coal tar pitch. These plies shall extend out on the roofing at least four (4) inches and up the vertical surface six (6) inches. The last ply shall be coated with coal tar pitch. For roofing guaranteed for fifteen (15) years or less, a felt and pitch reinforcement of two (2) plies is sufficient.

BASE FLASHINGS—First—Over the felt and pitch reinforcement thus applied, the metal base flashing shall be set, extending out on the roof four (4) inches and up the vertical surface not less than ten (10) inches, nor more than twelve (12) inches. The base flashing shall be nailed to the roof deck with barbed roofing nails spaced not more than three (3) inches on centers on a line not exceeding three-quarters (¾) of an inch from the outer edge of the metal. If concrete roof deck does not permit of nailing, a creosoted wood nailing strip at least one (1) inch thick, with two (2) inch face and three (3) inch base, shall be installed, centered on a line three (3) inches from the vertical surface.

Second—End laps shall be locked and soldered unless otherwise specified.

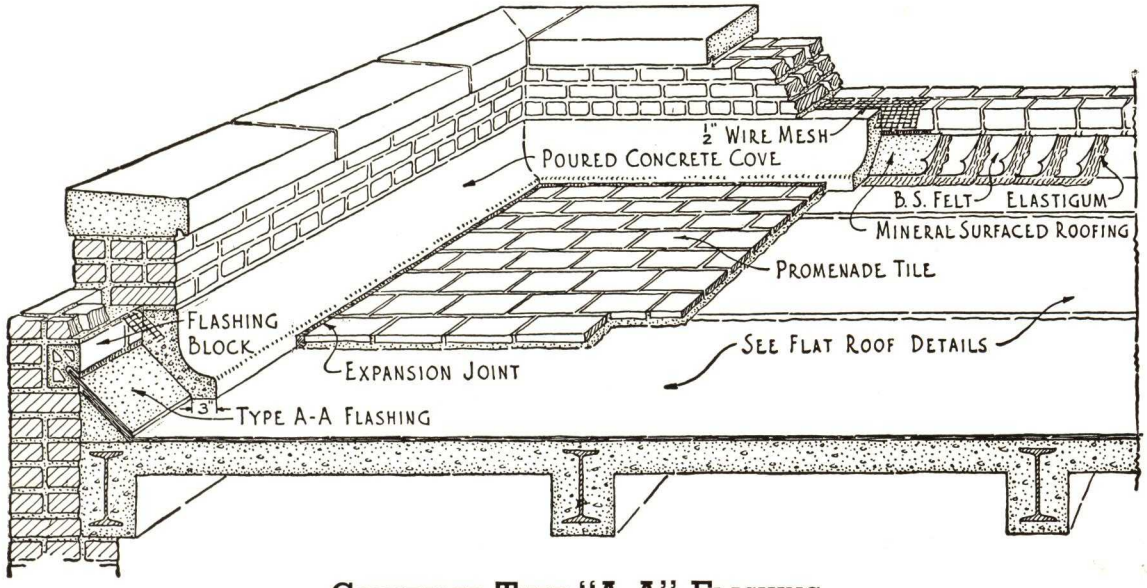
Third—The four (4) inches of metal on the roof shall be given a priming coat of Barrett Everjet paint. It shall then be coated with Coal Tar Pitch into which shall be immediately embedded a strip of tarred felt four (4) inches wide centered over the nailing course. The first strip shall be coated with Coal Tar Pitch into which shall be immediately embedded a second strip of tarred felt six (6) inches wide completely covering the first.



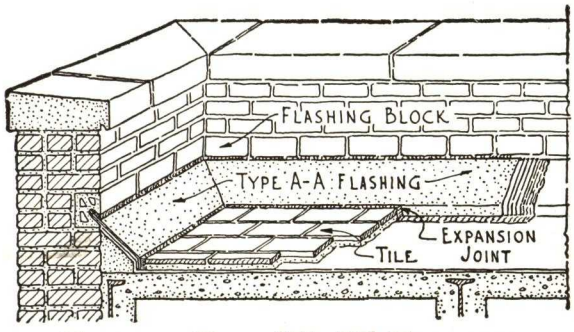
DETAIL FOR METAL CAP AND BASE FLASHING

DETAILS FOR INSTALLING FLASHING IN CONNECTION WITH PROMENADE TILE ROOFS

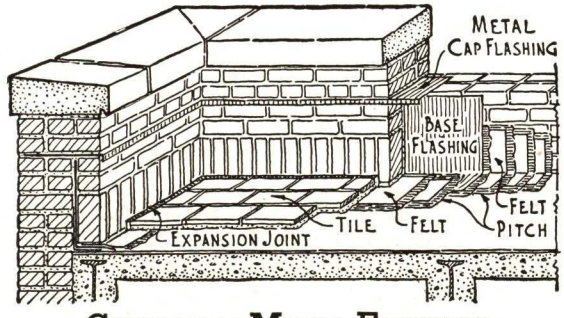
Barrett SINCE 1854



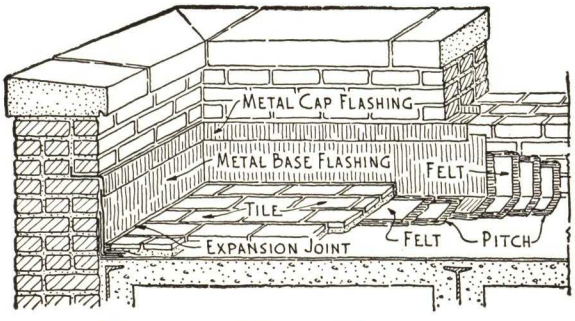
CONCEALED TYPE "A-A" FLASHING



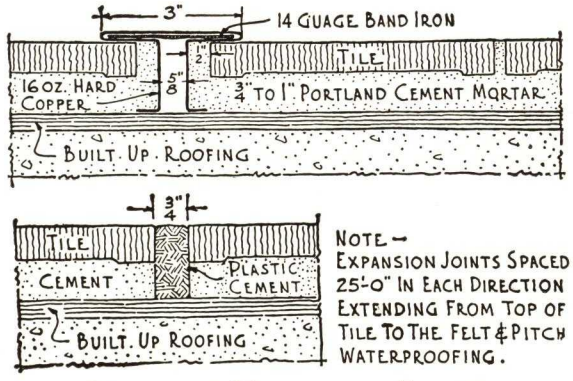
EXPOSED TYPE "A-A" FLASHING



CONCEALED METAL FLASHING



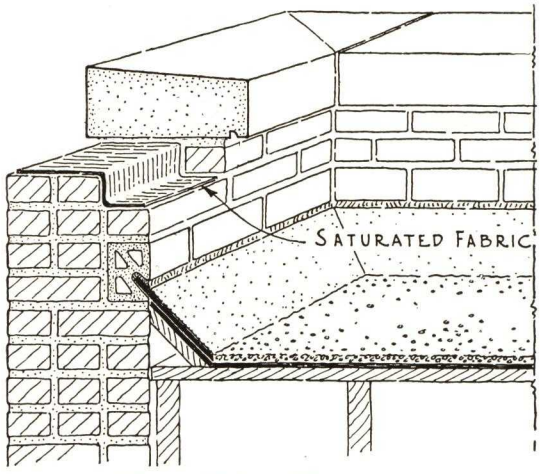
EXPOSED METAL FLASHING



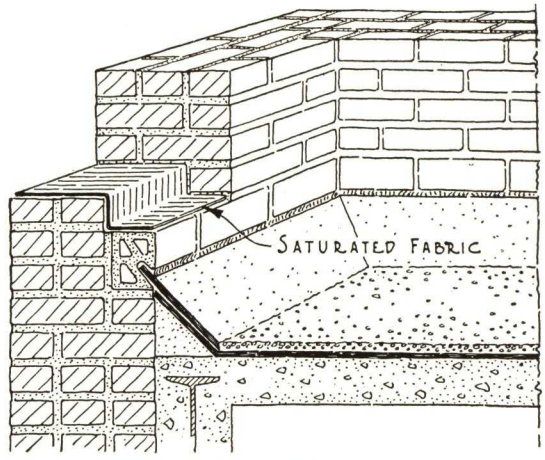
NOTE — EXPANSION JOINTS SPACED 25'-0" IN EACH DIRECTION EXTENDING FROM TOP OF TILE TO THE FELT & PITCH WATERPROOFING.

TYPES OF EXPANSION JOINTS

DETAILS FOR FLASHING PARAPET WALLS, SPANDREL BEAMS, ETC.



THRU WALL FLASHING
LOW PARAPET



THRU WALL FLASHING
HIGH PARAPET

SPECIFICATIONS FOR PARAPET WALLS

On all parapet walls, as detailed, provide and install waterproofing course consisting of two (2) plies of Barrett Waterproofing Fabric and three (3) full trowel coatings of Barrett Plastic P B Cement, applied alternately. Waterproofing course shall be continuous and shall extend to within one-half (½) inch of outside edges of walls. All end laps shall be not less than three (3) inches, and each succeeding layer shall break joints with underlying layer.

The fabric shall be applied without wrinkles or buckles and all trowel coatings shall be smooth and full. Care shall be taken not to injure the waterproofing course either during application or after completion.

Note No. 1—All surfaces on which the waterproofing course is to be installed shall be smooth, dry and free from loose materials.

Note No. 2—On low parapets waterproofing course may be installed under copings. On high parapets or party walls waterproofing course shall be installed flush with top of counter flashing or raggle block.

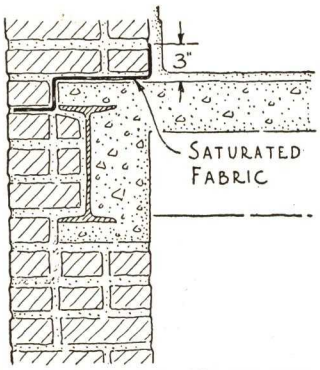
SPECIFICATIONS FOR SPANDREL BEAMS, ETC.

At all spandrels, as detailed, provide and install waterproofing course consisting of two (2) plies of Barrett Waterproofing Fabric, and three (3) full trowel coatings of Barrett Plastic P B Cement, applied alternately. Waterproofing course shall be continuous, shall extend to within one-half (½) inch of outside edge of wall, and shall be turned up and cemented to inside walls to a height of at least three (3) inches. All end laps shall be not less than three (3) inches, and each succeeding layer shall break joints with underlying layer.

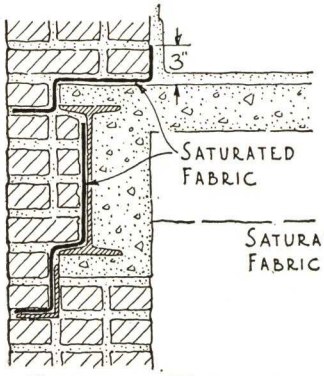
The fabric shall be applied without wrinkles or buckles and all trowel coatings shall be smooth and full. Care shall be taken not to injure the waterproofing course either during application or after completion.

Note No. 1—All surfaces on which the waterproofing course is to be installed shall be smooth, dry and free from loose materials.

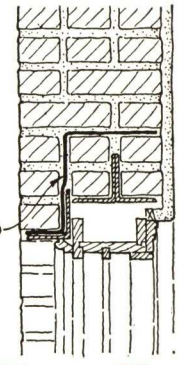
Note No. 2—Method to be followed (whether counter or base and counter) shall be clearly indicated on plans and in specifications prepared by architect.



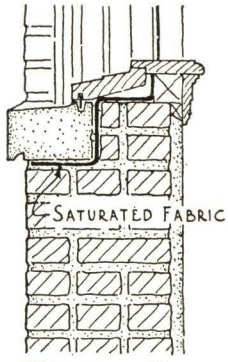
SPANDREL FLASHING
COUNTER TYPE



SPANDREL FLASHING
BASE & COUNTER TYPE



WINDOW HEAD
FLASHING



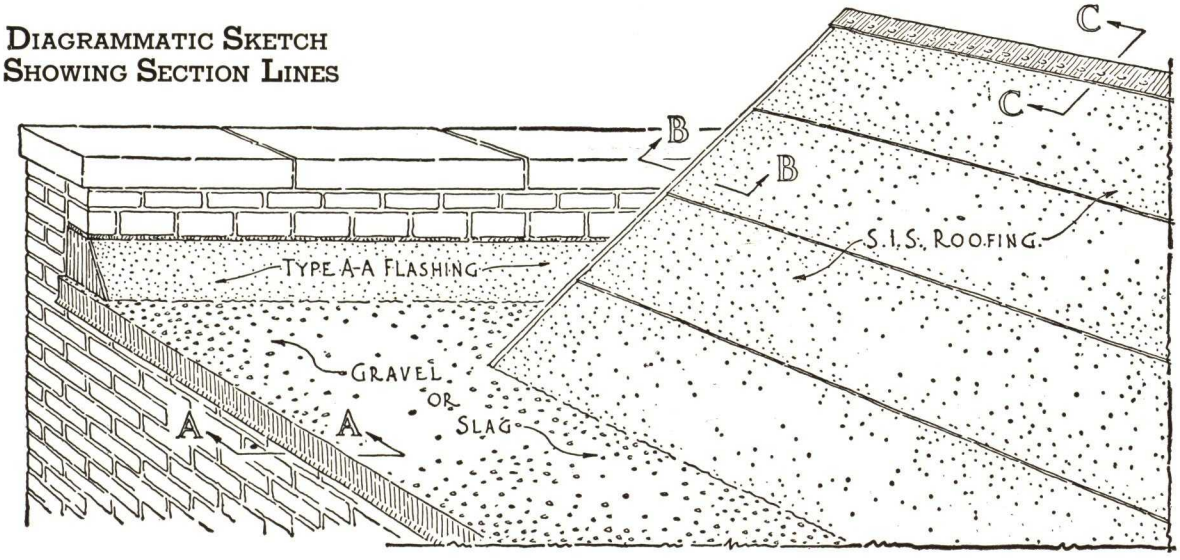
WINDOW SILL
FLASHING

DETAILS FOR FLAT AND STEEP ROOF CONSTRUCTION.

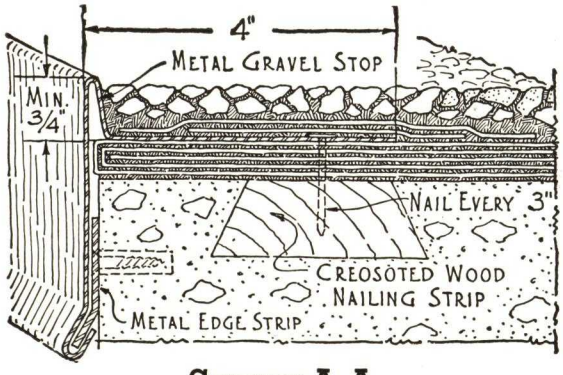
METHOD OF FINISHING EAVES AND EDGES.

Barrett SINCE 1854

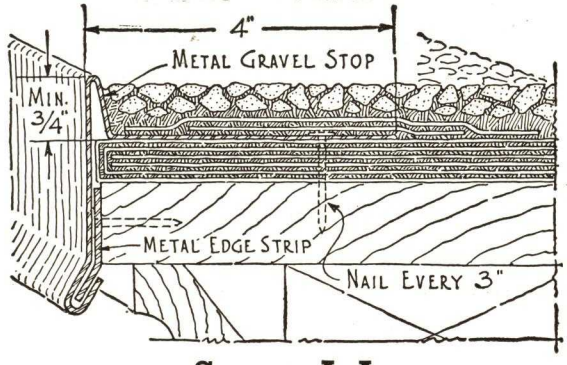
DIAGRAMMATIC SKETCH
SHOWING SECTION LINES



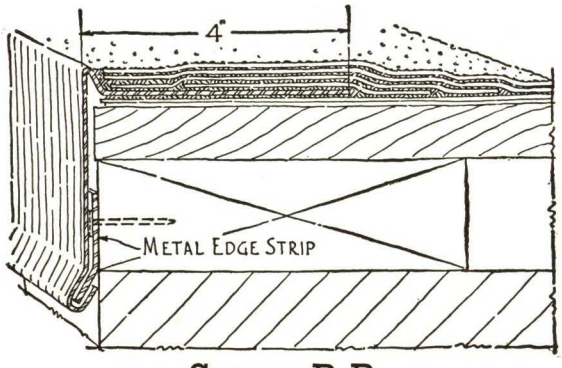
DETAILS FOR FINISHING EAVES AND EDGES



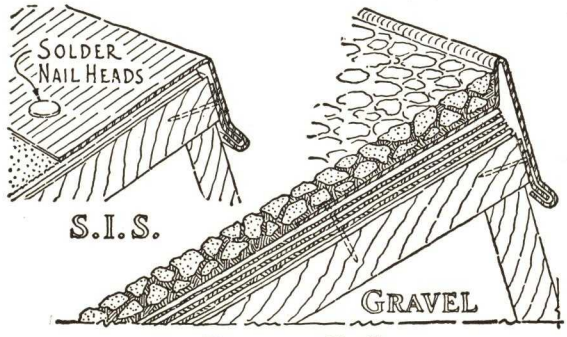
SECTION A-A
METAL EAVE FOR CONCRETE DECK



SECTION A-A
METAL EAVE FOR WOOD DECK

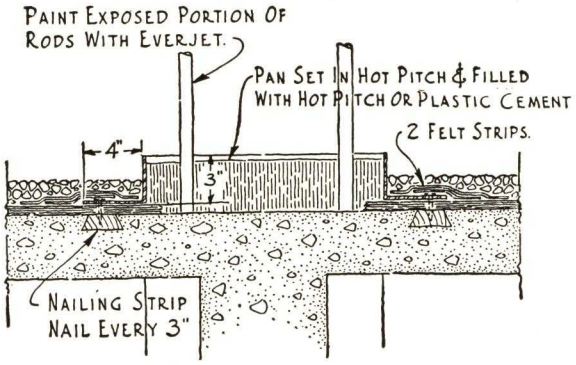


SECTION B-B
GABLE EDGE FOR STEEP ROOFS

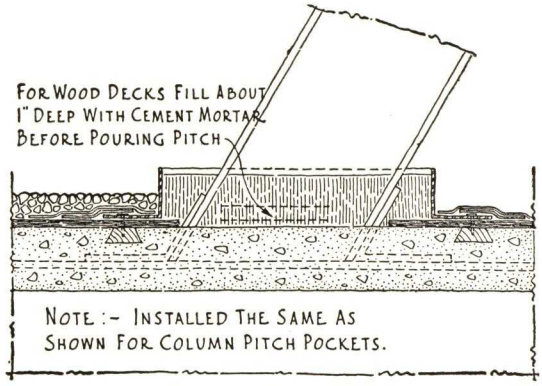


SECTION C-C
METAL RIDGE FOR SAWTOOTH SKYLIGHT

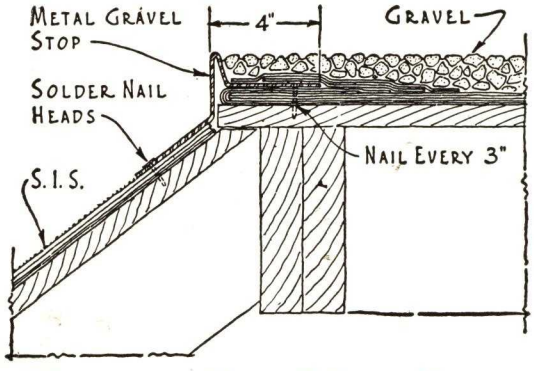
DETAILS FOR FLASHING SIGN SUPPORTS, STACKS, STUB COLUMNS, ETC.



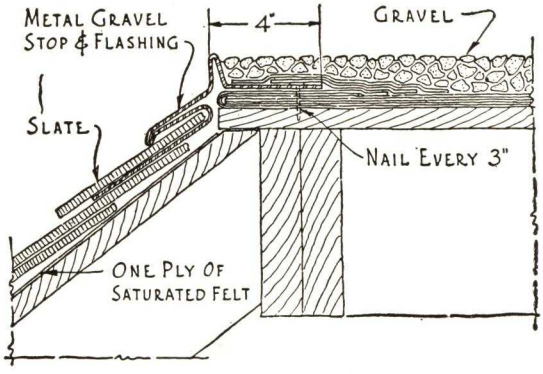
PITCH POCKETS FOR COLUMNS



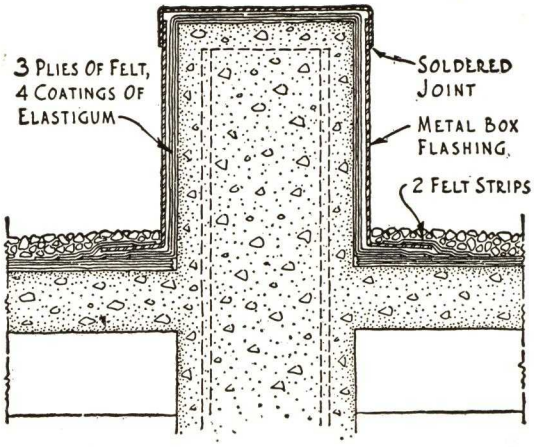
PITCH POCKETS FOR SIGN SUPPORTS



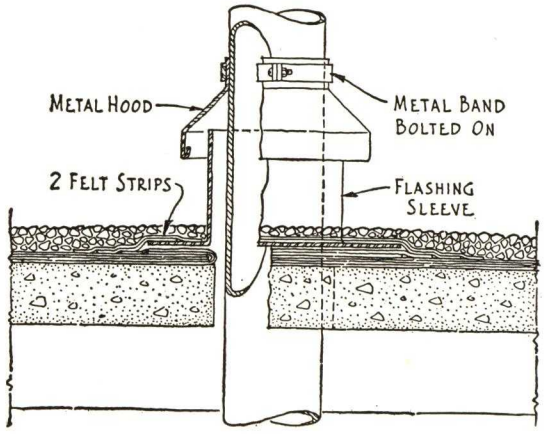
DETAIL FOR FLAT & STEEP ROOF CONNECTION



DETAIL FOR FLAT & STEEP SHINGLE TYPE ROOF CONNECTION



METAL CASING FOR STUB COLUMNS



FLASHING FOR STACKS

SECTION 4

ROOF DRAINAGE SYSTEMS

ROOF DRAINS SHOULD BE PERMANENT

In all types of roof construction, it is consistent that roof drains be at least as permanent as the roof coverings they serve. They should be easy to install, should effectively function under all prevailing conditions, and should provide against clogging of drainage outlets by leaves or debris deposited on the roof proper.

The Barrett-Holt Roof Connection

The Barrett-Holt Roof Connection* meets the demand for a completely assembled, long-lived and dependable roof drain fixture. The connection is made up in a variety of types to meet the particular conditions involved. It consists of a roof fitting with roof locking attachment; a component flashing flange; and an expansion joint. The types furnished for use in connection with inside leader lines are equipped with a cast metal tile or gravel stop; a strainer plate; and serviceable cast metal strainer.

The flashing flange furnished as a component part of the Barrett-Holt Roof Connection assures a dependable connection between the leader head unit and the roof covering. The expansion joint makes possible a flexible, yet water and gas-tight joint between the connection and the pipe or fixture joined to it. The changes resulting from shrinkage, settlement, and expansion or contraction are thereby properly provided for without danger of broken joints or troublesome leaks.

They are used: (1) As a roof leader connection where inside leader or conductor pipe is installed; (2) As a roof vent connection where soil or waste vent pipe is installed; (3) As a connection where any pipe, flag-pole, tank support or similar fixture is carried through the roof deck of a building.

Used More Than Twenty Years

More than twenty years of use under exacting conditions have proved the Barrett-Holt Roof Connection to be the most dependable device of its kind on the market. It simplifies specification procedure—a type to meet each need can be specified in a few words. It is easy to install, and allowances covering extra parts or assembly costs are not necessary.

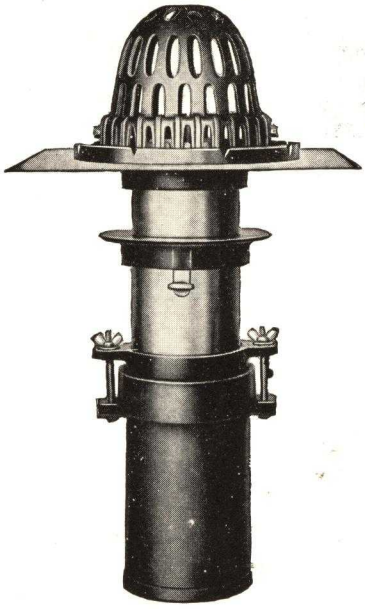
The Barrett-Holt Roof Connections described are standard, and are recommended for use on all types of flat and steep roof construction, in accordance with the specifications outlined.

*Patented

BARRETT-HOLT ROOF LEADER AND VENT CONNECTIONS

FOR SLAG OR SMOOTH SURFACED ROOFS

Type 6 Vent Connection



Type 1 Leader Connection

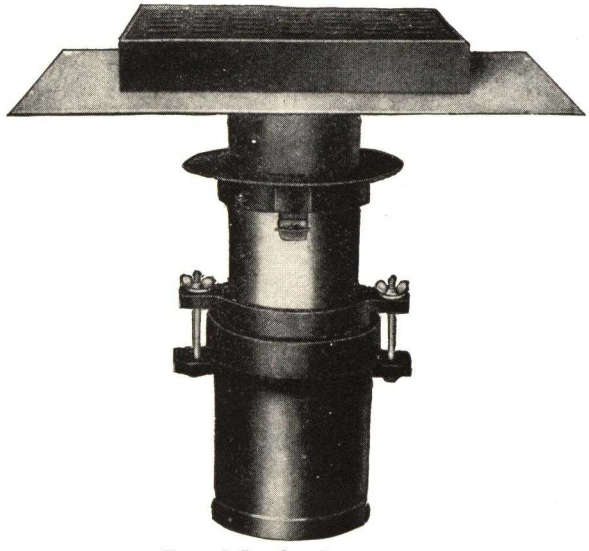
Type 5 Leader Connection

Type 6 Leader Connection

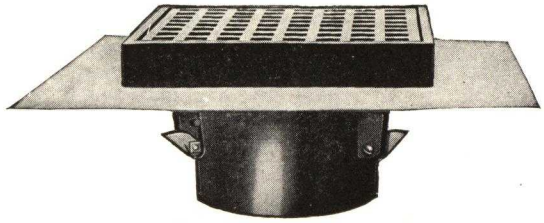
FOR INCLINED ROOFS

Type 2 Leader Connection

FOR TILE SURFACED ROOFS



Type 1 Leader Connection

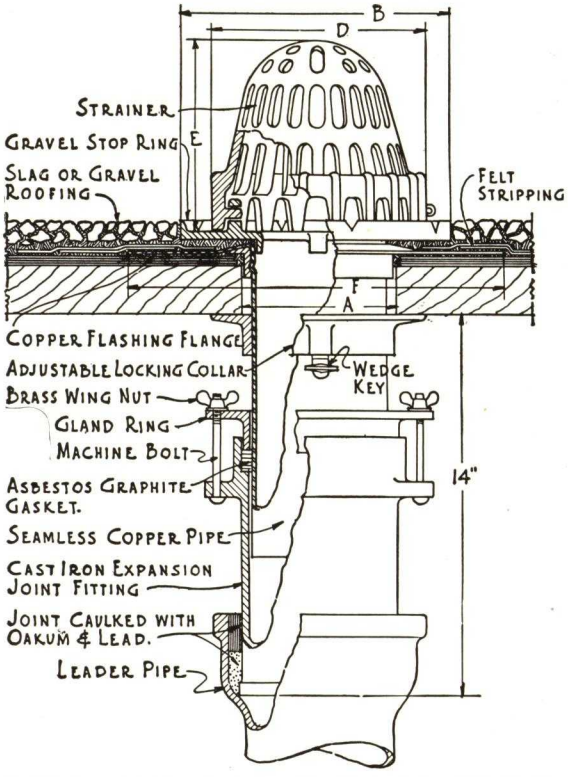


Type 6 Leader Connection

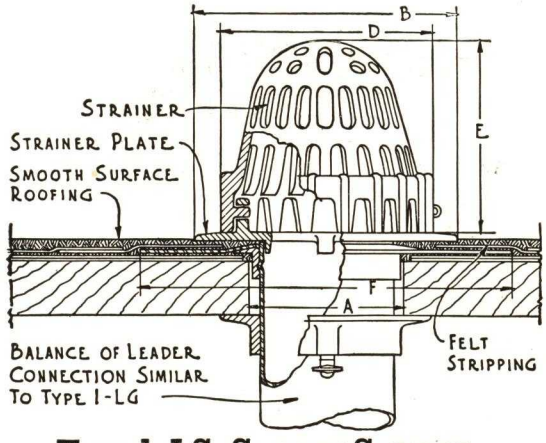
METHOD OF INSTALLING BARRETT-HOLT LEADER CONNECTIONS FOR TYPES 1-LG, 1-LS AND 1-LM

Barrett SINCE 1854

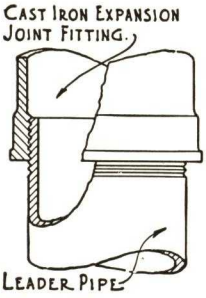
These types are used as leader connections on flat roofs having interior drainage, except roofs covered with tile or a similar material, and where ample working space is provided below the roof deck.



TYPE 1-LG, SLAG OR GRAVEL SURFACE



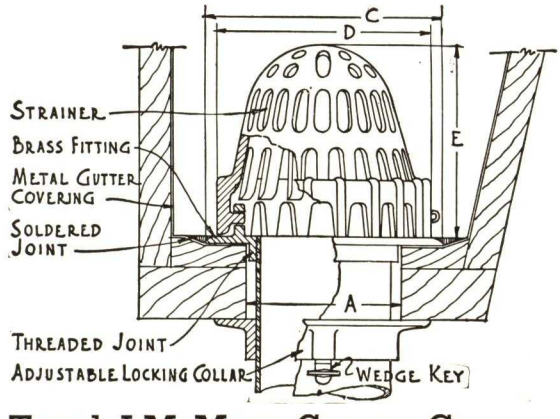
TYPE 1-LS, SMOOTH SURFACE



FOR THREADED PIPE

SIZE OF PIPE	A	B	C	D	E	F
3"	4"	8"	7"	6¾"	6⅛"	12"x12"
4"	5"	8"	7"	6¾"	6⅛"	12"x12"
5"	6"	10¾"	9¾"	9½"	8½"	14"x14"
6"	7"	10¾"	9¾"	9½"	8½"	16"x16"
8"	9"	11¾"	11"	10½"	9½"	18"x18"
10"	11"	14¼"	13½"	13"	11"	20"x20"

DIMENSION TABLE



TYPE 1-LM, METAL COVERED GUTTERS

TABLE SHOWING LENGTH OF CONNECTION REQUIRED FOR GIVEN THICKNESS OF ROOF DECK	
THICKNESS OF ROOF DECK	LENGTH OF CONNECTION
1" MAX.	10"
3" "	12"
5" "	14"
7" "	16"
9" "	18"

NOTE.- WHEN SCREW THREAD PIPE IS TO BE USED IN BUILDINGS CONSTRUCTED OF STEEL, CONCRETE, BRICK, STONE OR SIMILAR NON-SHRINKABLE MATERIAL, AND THE EXPANSION AND CONTRACTION OF THE LEADER PIPE WILL NOT EXCEED 1", A CONNECTION 2" SHORTER MAY BE USED. THE MINIMUM LENGTH OF THE CONNECTION IS 10".

SPECIFICATION FOR INSTALLING BARRETT-HOLT LEADER CONNECTIONS, TYPES 1-LG, 1-LS AND 1-LM

PREPARATION OF DECK—The opening through the roof deck shall be of proper size to receive the Roof Leader Connection and shall be concentric with leader pipe.

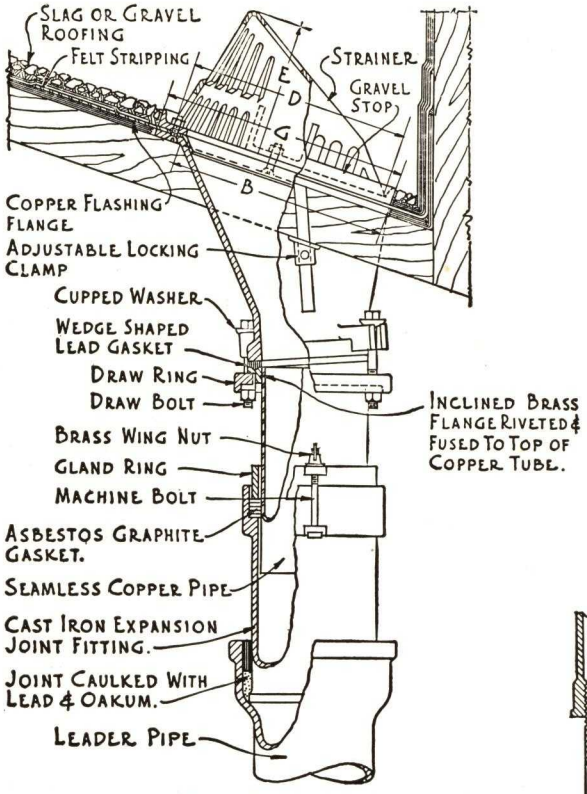
Barrett-Holt Roof Leader Connection, Type .... shall be installed at the drainage outlets and shall be of proper size and length to connect to .... inch leader pipe as shown on Drawing No. .....

Barrett-Holt Roof Leader Connections shall be installed and connected complete in strict accordance with directions of the manufacturer.

Note—Where built-up roofing is used as a roof covering, two plies of Felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches before application of finished roof surfacing.

IMPORTANT—The copper flashing flange being an integral part of the Types 1-LG, 1-LS and 1-LM Connections, shall in no case be removed. If the flange is bent, it shall be straightened and made smooth before it is set in place. The flashing flange shall be secured to the roof deck with nails wherever possible.

METHOD OF INSTALLING BARRETT-HOLT LEADER CONNECTIONS FOR TYPES 2-LG AND 2-LS

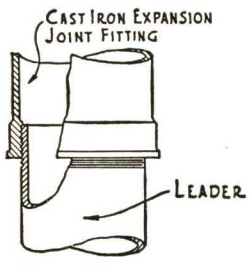


SIDE VIEW

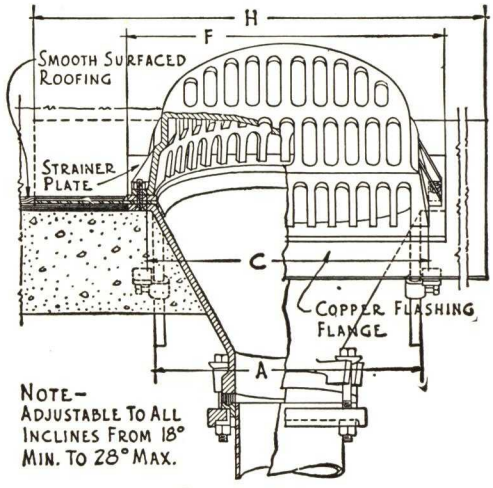
TYPE 2-LG, STEEP SLAG OR GRAVEL SURFACE

SIZE OF PIPE	A	B	C	D	E	F	G	H
3"	9 1/8"	6 3/4"	10 1/8"	7 1/8"	4 5/8"	10 7/8"	7 3/8"	18"x18"
4"	10 3/8"	8 3/8"	11 3/8"	8 5/8"	5 3/8"	12 1/4"	9 3/8"	20"x20"
5"	11 3/8"	9 1/8"	12 1/2"	9 1/8"	5 1/2"	13 1/8"	10 1/2"	22"x22"
6"	12 3/4"	10 3/8"	13 3/4"	10"	5 3/8"	14 1/4"	11 3/4"	24"x24"
8"	THIS CONNECTION ON SPECIAL ORDER.							

DIMENSION TABLE



FOR THREADED PIPE



FRONT VIEW

TYPE 2-LS, STEEP SMOOTH SURFACE

This type is used as a leader connection on inclined roofs ranging from 12° to 42° and having interior drainage. The range of variation of the standard connection is from 18° to 28°. For lesser inclines ranging from 12° to 18° or greater inclines ranging from 28° to 42° special fittings are furnished.

SPECIFICATION FOR INSTALLING BARRETT-HOLT LEADER CONNECTIONS, TYPES 2-LG AND 2-LS

PREPARATION OF SURFACES—The opening through the roof deck shall be of proper size to receive the Roof Leader Connection, and shall be concentric with leader pipe.

INSTALLATION OF LEADER CONNECTIONS—First—Barrett-Holt Roof Leader Connection, Type ..... shall be installed at all drainage outlets and shall be of proper size and length to connect to ..... inch leader pipe as shown on Drawing No. .....

Second—Barrett-Holt Roof Leader Connection shall be adjusted to fit the roof incline and draw-bolts tightened to obtain a water-tight joint. The Connection shall be set in place so that the lower surface of the iron flange shall be flush with the finished surface of the roof deck. The adjustable locking clamps shall be brought up tightly against the under-side of the roof deck and firmly fastened with the set screws so that the Connection is made integral with the roof deck.

Third—At each drainage point a section of the valley roofing not less than three (3) feet wide shall be carried up the inclined surface of the roof deck not less than two (2) feet. Roofing shall terminate at the outer edge of the iron flange of the Connection.

Fourth—After all roofing Felt has been laid and before the finished wearing surface is applied, the surface of the iron flange of the Connection shall be thoroughly cleaned and the copper flashing flange embedded in Plastic Elastigum. If the flange is bent it shall be straightened and made smooth before being set in place. Flashing flange shall be nailed wherever possible. Iron gravel stop ring or strainer plate shall be set in Plastic Elastigum and firmly drawn down by brass nuts.

Fifth—The cast iron strainer shall be fastened in place (if a brass or aluminum strainer is desired, it shall be specified).

Sixth—The copper Flashing Flange shall be thoroughly mopped with hot bitumen into which, while hot, the steep roofing shall be applied and brought up to the gravel stop or strainer plate.

Seventh—The valley roofing shall be laid and brought up to the gravel stop or strainer plate.

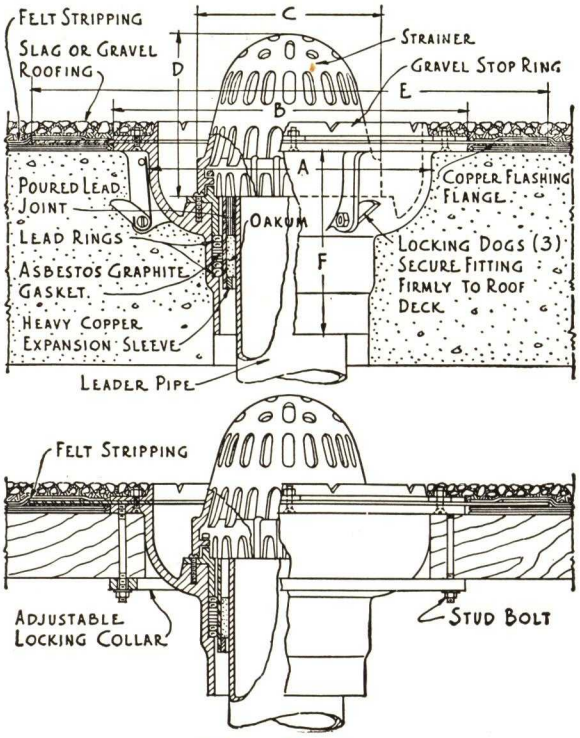
Eighth—The gland ring, gasket and expansion joint fitting shall be set in place and the last length of leader pipe cut to proper length and placed in position. The lower end of the expansion joint fitting shall be not less than fourteen (14) inches from the bottom of the veins on the side of the roof bowl.

Ninth—The gasket and gland ring shall be brought down into the expansion joint fitting, bolted and tightened sufficiently by the wing nuts to obtain a water-tight connection. The joint between the expansion joint and the leader pipe shall then be made.

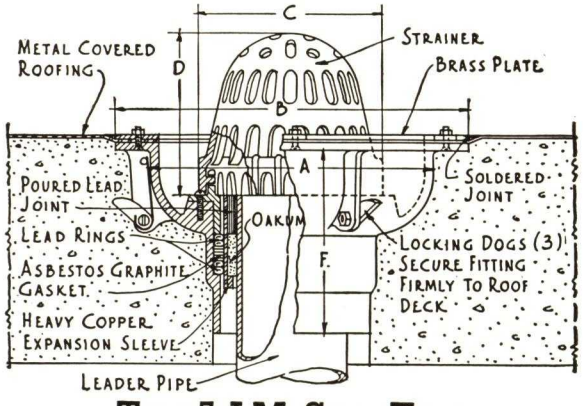
METHOD OF INSTALLING BARRETT-HOLT LEADER CONNECTIONS FOR TYPES 5-LG, 5-LS AND 5-LM

Barrett SINCE 1854

These types are used as leader connections on flat roofs having interior drainage, where a sump type of roof connection is desired.



TYPE 5-LG, SUMP TYPE SLAG OR GRAVEL SURFACE



TYPE 5-LM, SUMP TYPE METAL COVERED GUTTERS & ROOFS

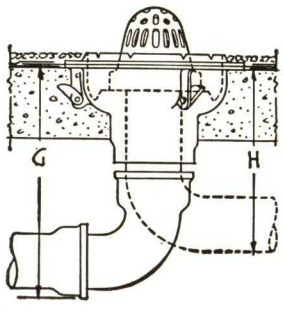
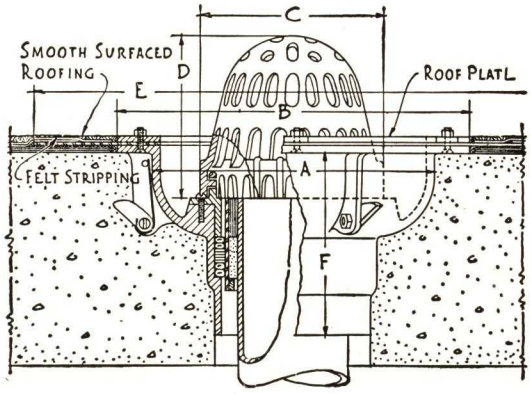


TABLE OF MIN. DIMENSIONS		
SIZE OF PIPE	G	H
3"	17¾"	11½"
4"	18¼"	12"
5"	18¾"	12½"
6"	19¼"	13"
8"	20"	13½"



TYPE 5-LS, SUMP TYPE SMOOTH SURFACE

NOTE—
STUD BOLTS AND ADJUSTABLE LOCKING COLLAR USED ONLY FOR WOOD OR GYPSUM ROOF DECKS.

SIZE OF PIPE	A	B	C	D	E	F
3"	10¼"	12⅝"	6¾"	6⅜"	20"x20"	7"
4"	12¼"	14⅝"	9½"	8½"	24"x24"	7"
5"	12¼"	14⅝"	9½"	8½"	24"x24"	7"
6"	13¼"	15⅝"	10½"	9½"	24"x24"	7"
8"	15¼"	17⅝"	13"	11"	26"x26"	7"

DIMENSION TABLE

SPECIFICATION FOR INSTALLING BARRETT-HOLT LEADER CONNECTIONS, TYPES 5-LG, 5-LS AND 5-LM

PREPARATION OF SURFACES—The opening through the roof deck shall be of proper size to receive the Roof Leader Connection and shall be concentric with the leader pipe.

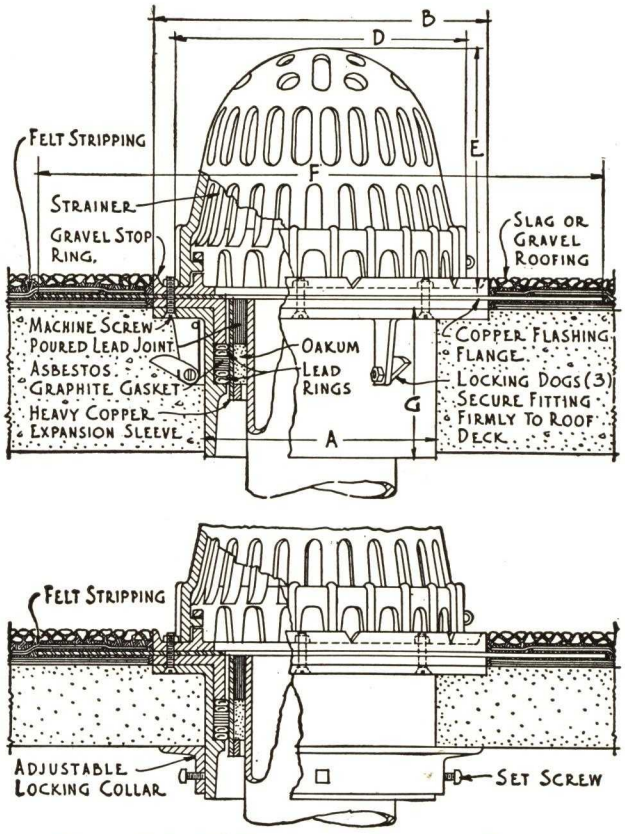
INSTALLATION OF LEADER CONNECTIONS—First—Barrett-Holt Roof Leader Connection Type ..... shall be installed at all drainage outlets and shall be of proper size and length to connect to ..... inch leader pipe as shown on Drawing No. .....

Second—Barrett-Holt Roof Leader Connections shall be installed and connected complete in strict accordance with directions of the manufacturer.

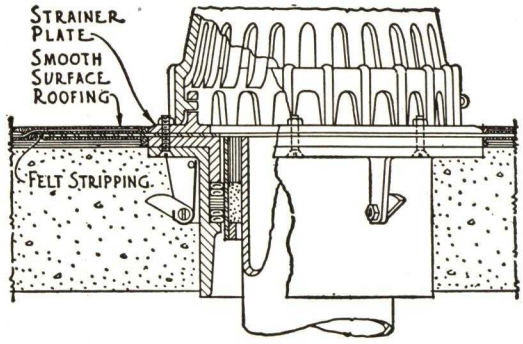
Note—Where built-up roofing is used as a roof covering, two (2) plies of felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches.

When used in connection with gypsum or wood roof decks, types 5-LG, 5-LS and 5-LM Connections are equipped with threaded stud bolts which hold the adjustable locking collar in place.

METHOD OF INSTALLING BARRETT-HOLT LEADER CONNECTIONS FOR TYPES 6-LG, 6-LS AND 6-LM



TYPE 6-LG, SLAG OR GRAVEL SURFACE

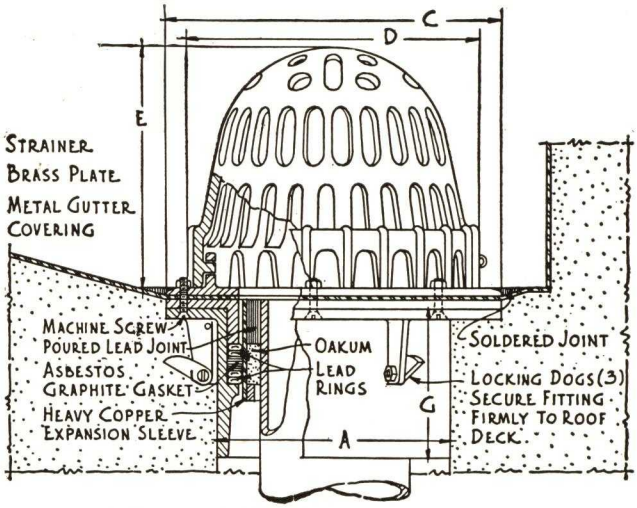


TYPE 6-LS, SMOOTH SURFACE

SIZE OF PIPE	A	B & C	D	E	F	G
3"	6¼"	10¾"	9½"	8½"	16"x16"	4½"
4"	7¼"	10¾"	9½"	8½"	18"x18"	4½"
5"	8¼"	11¾"	10½"	9½"	20"x20"	4½"
6"	9¼"	11¾"	10½"	9½"	20"x20"	4½"
8"	11¼"	14¼"	13"	11"	24"x24"	4½"

DIMENSION TABLE

These types are used as leader connections on flat roofs having interior drainage, except roofs covered with tile or a similar material, and where working space below the roof deck is restricted.



TYPE 6-LM, METAL COVERED GUTTERS & ROOFS

SPECIFICATION FOR INSTALLING BARRETT-HOLT LEADER CONNECTIONS, TYPES 6-LG, 6-LS AND 6-LM

The opening through the roof deck shall be of proper size to receive the Roof Leader Connection and shall be concentric with the leader pipe.

Barrett-Holt Roof Leader Connection Type ..... shall be installed at all drainage outlets and shall be of proper size and length to connect to ..... inch leader pipe as shown on Drawing No. .....

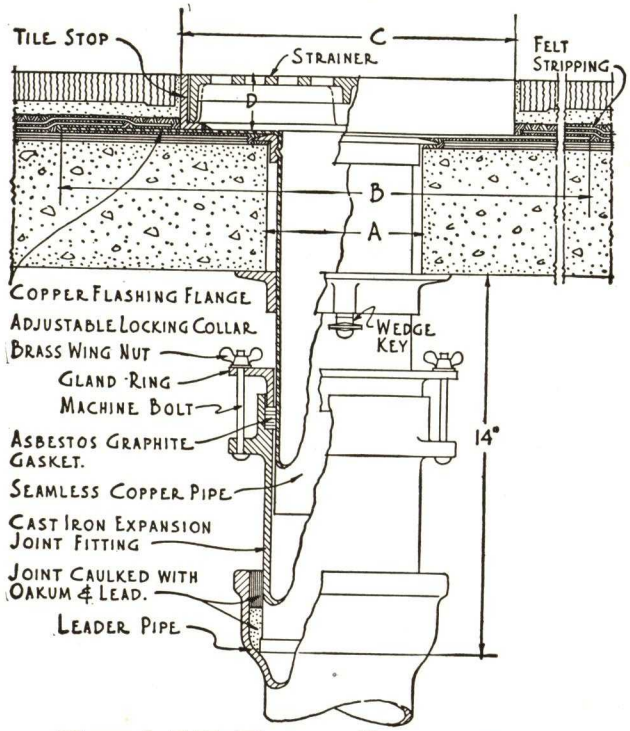
Barrett-Holt Roof Leader Connections shall be installed and connected complete in strict accordance with directions of the manufacturer.

Where built-up roofing is used as a roof covering, two (2) piles of Felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches before application of finished surfacing.

Note—Where gypsum or wood roof deck exceeds three and one-half (3½) inches in thickness, Types 6-LG, 6-LS and 6-LM Connections are equipped with threaded stud bolts which hold the adjustable locking collar in place.

METHOD OF INSTALLING BARRETT-HOLT LEADER CONNECTIONS TYPES 1-LT AND 6-LT FOR TILE SURFACED ROOFS

Barrett SINCE 1854



TYPE 1-LT, TILE OR SIMILAR SURFACE

SIZE OF PIPE	A	B	C	•D
3"	4"	18"x18"	10 3/8"	3/4" TO 3 1/2" UNIT OF VARIATION • 1/4"
4"	5"	18"x18"	10 3/8"	
5"	6"	18"x18"	10 3/8"	
6"	7"	18"x18"	10 3/8"	
8"	9"	ON SPECIAL ORDER ONLY		
10"	11"			

DIMENSION TABLE

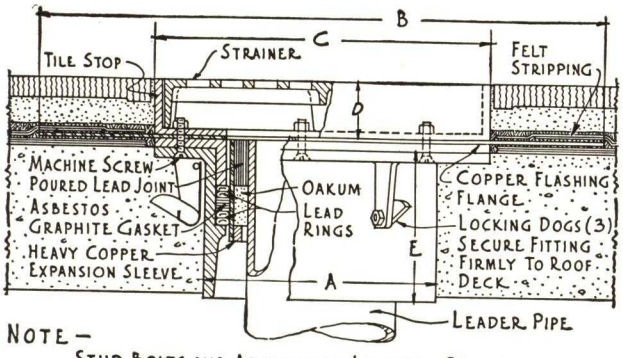
SPECIFICATION FOR INSTALLING BARRETT-HOLT LEADER CONNECTIONS TYPES 1-LT AND 6-LT

The opening through the roof deck shall be of proper size to receive the Roof Leader Connection and shall be concentric with leader pipe.

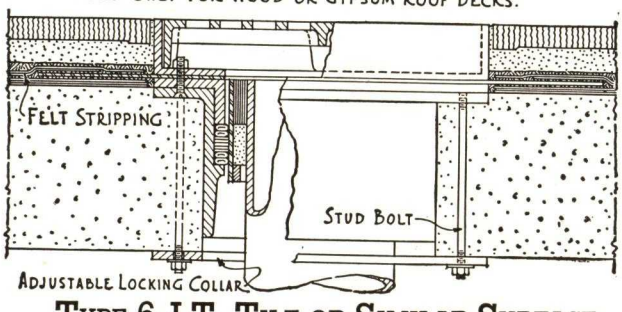
Barrett-Holt Roof Leader Connection Type ..... shall be installed at all drainage outlets and shall be of proper size and length to connect to ..... inch leader pipe as shown on Drawing No. .....

Barrett-Holt Roof Leader Connections shall be installed and connected complete in strict accordance with directions of the manufacturer.

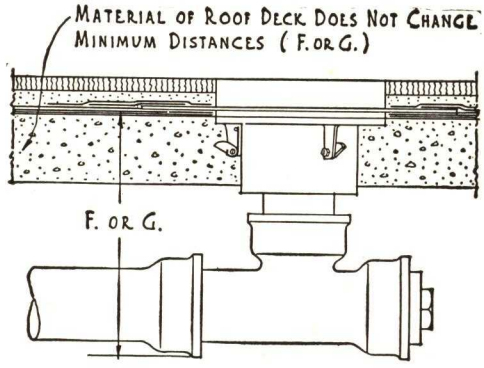
Before the application of the cement bed or the finished surfacing material, two (2) plies of Felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches.



NOTE — STUD BOLTS AND ADJUSTABLE LOCKING COLLAR USED ONLY FOR WOOD OR GYPSUM ROOF DECKS.



TYPE 6-LT, TILE OR SIMILAR SURFACE

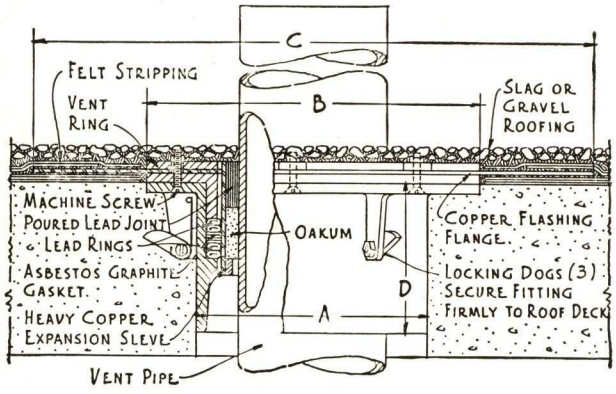


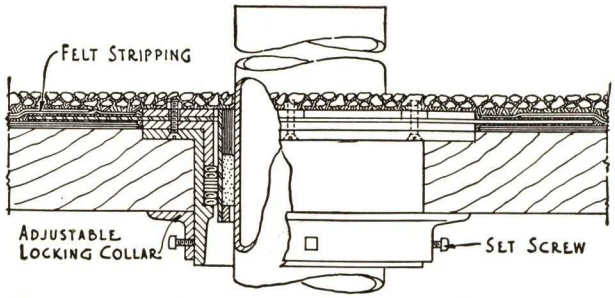
F — REFERS TO CAST IRON SOIL PIPE
G — REFERS TO WROUGHT IRON OR STEEL SCREW PIPE.

SIZE OF PIPE	A	B	C	D	E	F	G
3"	6 1/4"	20"x20"	10 1/2"	1" TO 3 1/2" UNIT OF VARIATION 1/4"	4 1/2"	15 1/4"	13 1/2"
4"	7 1/4"	20"x20"	10 1/2"		4 1/2"	15 3/4"	14 1/4"
5"	8 1/4"	20"x20"	10 1/2"		4 1/2"	16 1/4"	14 3/4"
6"	9 1/4"	20"x20"	10 1/2"		4 1/2"	16 3/4"	15 1/4"
8"	11 1/4"	24x24	SPEC.		4 1/2"	17 3/4"	17 3/4"

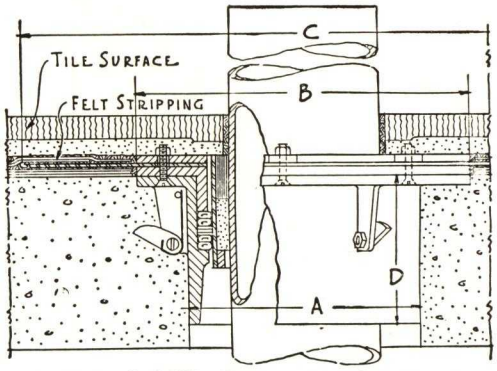
DIMENSION TABLE

METHOD OF INSTALLING BARRETT-HOLT VENT CONNECTIONS FOR TYPES 6-VG, 6-VS, 6-VT AND 6-VM

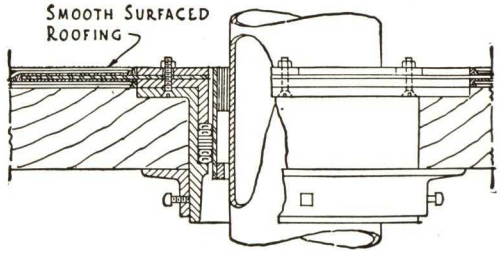




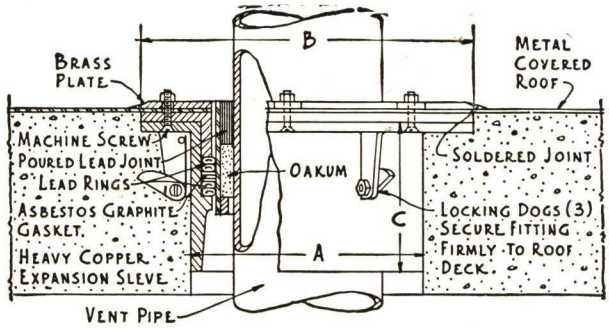
TYPE 6-VG, SLAG OR GRAVEL SURFACE



TYPE 6-VT, TILE OR SIMILAR SURFACE



TYPE 6-VS, SMOOTH SURFACE

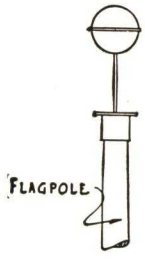


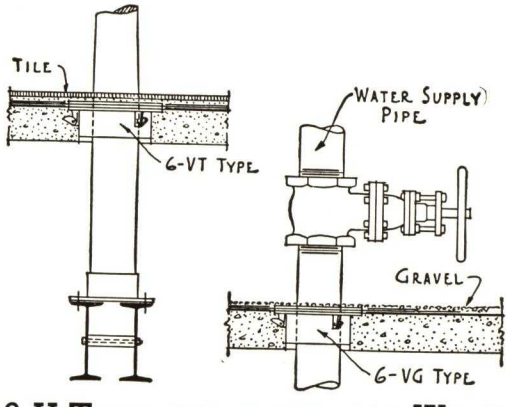
TYPE 6-VM, METAL COVERED ROOFS

These types used on flat roofs for soil and waste vent stacks, flag-poles, supply pipes or any similar fixture carried through the roof deck.

SIZE OF PIPE	A	B	C	D
3"	6 1/4"	8 3/4"	16"x16"	4 1/2"
4"	7 1/4"	9 3/4"	18"x18"	4 1/2"
5"	8 1/4"	10 3/4"	20"x20"	4 1/2"
6"	9 1/4"	11 3/4"	20"x20"	4 1/2"
8"	11 1/4"	14 3/8"	24"x24"	4 1/2"

DIMENSION TABLE





6-V TYPES CAN BE USED FOR WATER PIPES, FLAGPOLES, FIRE LINES, ETC

SPECIFICATION FOR TYPES 6-VG, 6-VS, 6-VT AND 6-VM

The opening through roof deck shall be of proper size to receive Roof Vent Connection and shall be concentric with vent pipe.

Barrett-Holt Roof Vent Connection Type ..... shall be installed at all vent openings and shall be of proper size to connect with .... inch vent pipe as shown on Drawing No. .....

Barrett-Holt Roof Vent Connections shall be installed and connected complete in strict accordance with directions of manufacturer.

Where built-up roofing is used as a roof covering, two (2) plies of Felt thoroughly embedded in hot bitumen shall be applied over the entire copper flashing flange, the outer edge of the first ply to extend beyond the flange not less than three (3) inches and of the second ply not less than six (6) inches before the application of finished surfacing.

Note: Where gypsum or wood roof decks exceed 3½ inches in thickness, connections are equipped with threaded stud bolts which hold adjustable locking collar in place.

SECTION 5

WATERPROOFING AGAINST HYDROSTATIC PRESSURE

MEMBRANE WATERPROOFING

A Vital Part of Building Construction

Waterproofing in some form is essential to the life and stability of many structures. Just what this form should be is a problem not exactly determinable by precise mathematical calculation. However, with a careful study of conditions, with the knowledge of definite factors and with the help of past experience, a form or method of waterproofing may be devised for the specific conditions encountered. Proper waterproofing materials, intelligently selected and skillfully applied, are vital factors in making engineering structures watertight.

A Blanket of Protection

For most satisfactory results the use of the membrane method of waterproofing is recommended. This method correctly followed not only protects but prolongs the life of any structure, and has been successfully used over a long period of years. It provides an elastic and continuous bituminous waterproofing blanket, composed of layers of waterproofing felt or fabric, homogeneously cemented with suitable waterproofing bitumen.

Water Pressure

The use of the membrane system applies generally to the waterproofing of structures exposed to hydrostatic pressure or conditions of dampness or moisture, particularly those below ground surface, such as foundations of buildings, tunnels, subways, or other forms of sub-construction. It is equally adaptable to the waterproofing of reservoirs, bridges, retaining walls, etc.

The following specifications treat with specific conditions. The materials specified are prepared expressly for the purposes intended, and are definitely suited to the conditions under which they are required to function. The application methods described are accepted as standard practice.

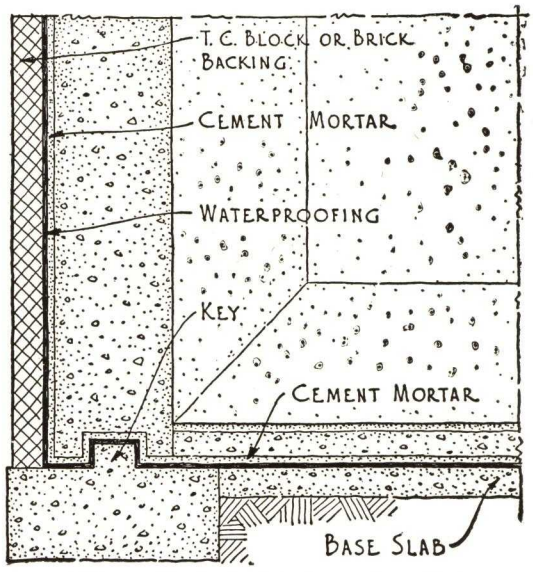
Workmanship

Barrett Approved Waterproofing Contractors are skilled in the art of waterproofing. Their employment on specific installations, in accordance with the specifications outlined, assures satisfactory results.

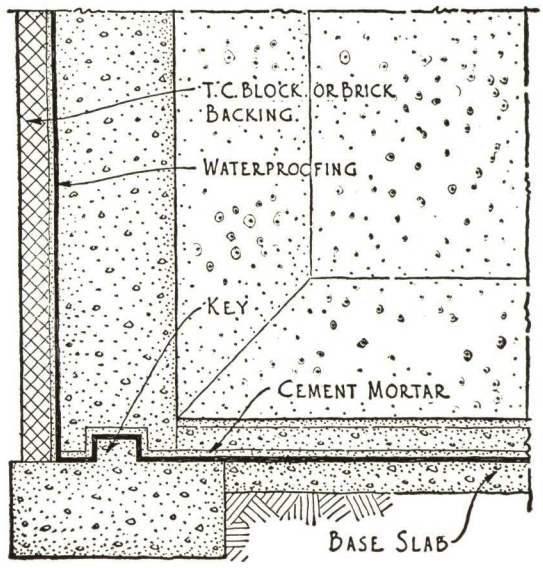
BARRETT ENGINEERING CONSULTING SERVICE

The services of our Construction Service Department are available for consultation or co-operation in the preparing of specifications or handling of unusual installations not incorporated in this section.

MEMBRANE METHOD OF SUBSTRUCTURE WATERPROOFING



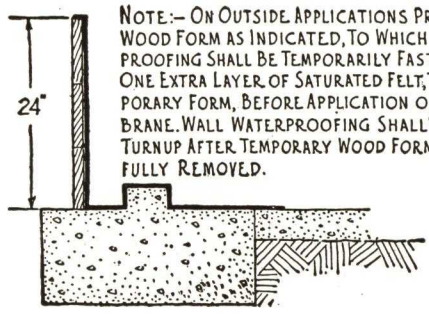
WATERPROOFING DETAIL FOR OUTSIDE WALLS, FOOTINGS, ETC.
- INSIDE APPLICATION -



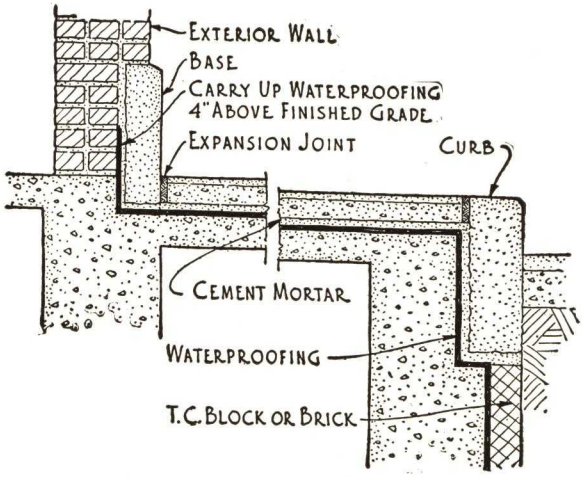
WATERPROOFING DETAIL FOR OUTSIDE WALLS, FOOTINGS, ETC.
- OUTSIDE APPLICATION -

NOTE:-
ON INSIDE APPLICATIONS WATERPROOFING MEMBRANE, AS SPECIFIED, IS APPLIED DIRECTLY TO THE TILE OR BRICK BACKING AS INDICATED.

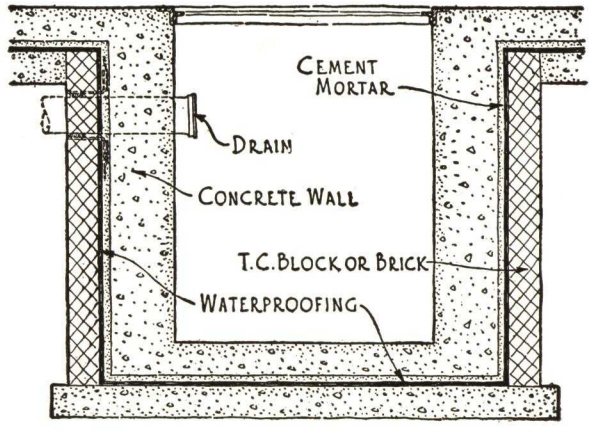
IMPORTANT -
ALL MASONRY SHALL BE DESIGNED TO WITHSTAND THE MAXIMUM HYDROSTATIC PRESSURE.
SEE PLATE 49 FOR WATERPROOFING SPECIFICATIONS.



NOTE:- ON OUTSIDE APPLICATIONS PROVIDE TEMPORARY WOOD FORM AS INDICATED, TO WHICH THE FLOOR WATERPROOFING SHALL BE TEMPORARILY FASTENED. PROVIDE ONE EXTRA LAYER OF SATURATED FELT, TACKED DRY TO TEMPORARY FORM, BEFORE APPLICATION OF SPECIFIED MEMBRANE. WALL WATERPROOFING SHALL OVERLAP MEMBRANE TURNUP AFTER TEMPORARY WOOD FORMS HAVE BEEN CAREFULLY REMOVED.



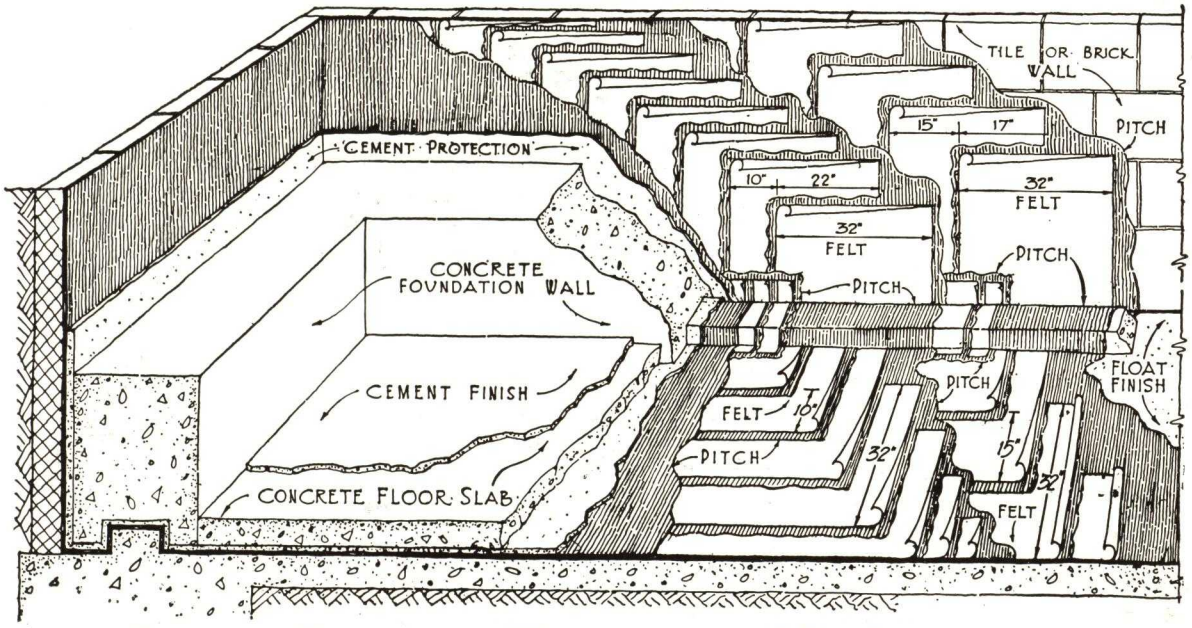
WATERPROOFING DETAIL FOR VAULTS & TUNNELS



WATERPROOFING DETAIL FOR SUMPS & PITS

MEMBRANE METHOD OF SUBSTRUCTURE WATERPROOFING

Barrett SINCE 1854



DETAIL FOR SUBSTRUCTURE WATERPROOFING — 5 PLY CONSTRUCTION

IMPORTANT—All Masonry Shall Be Designed to Withstand Maximum Hydrostatic Pressure

SPECIFICATION

Note—The waterproofing shall be applied by a waterproofing contractor approved by THE BARRETT COMPANY, who has had experience in successfully applying this type of built-up waterproofing on sub-grade construction, and who can refer to work of a similar nature that he has executed in a satisfactory manner.

PREPARATION OF SURFACES—All surfaces on which the waterproofing is to be applied shall be firm, smooth and dry, and free from loose materials, and shall be covered by a membrane of continuous waterproofing consisting of ..... plies of Barrett Tarred Felt and ..... moppings of Barrett Waterproofing Pitch.

APPLICATION OF WATERPROOFING—First—Coat the entire surface on which the waterproofing is to be applied with Barrett Waterproofing Pitch into which, while hot, embed a layer of Barrett Tarred Felt, as specified, following this with alternating moppings of Pitch and layers of Felt until ..... moppings of Pitch and ..... layers of Felt have been applied. Each layer of Felt shall be thoroughly rubbed into the hot Pitch, and the entire surface shall be immediately mopped with Pitch to insure thorough embedding of the Felt. The Felt shall be laid without wrinkles or buckles, and the finished membrane shall be free from pockets or blisters.

Second—Not less than .....* pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing, and the Pitch shall not be heated above three hundred and fifty (350) degrees Fahrenheit.

Third—At wall angles and footings and places where the waterproofing may be subjected to unusual strain, there shall be applied not less than two (2) extra reinforcing layers of Felt and alternating moppings of Pitch.

Fourth—Where laps are left to be connected, they shall be not less than ten (10) inches wide, and shall be temporarily protected by one-half (½) inch troweled course of Portland Cement Mortar. When connections with laps are made, laps shall be carefully cleaned, dry, and mopped with Pitch before proceeding with the work.

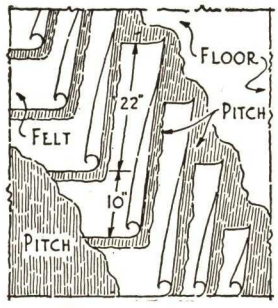
Fifth—Care shall be taken not to injure the waterproofing membrane either during application or after completion, and all finished work shall be approved before construction of permanent protective finish or wall.

Sixth—The waterproofing shall be immediately protected by tile, brick, concrete or similar material as specified.

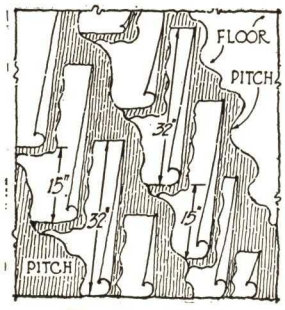
***Architect's Note**—For five (5) ply construction six (6) alternating moppings of Pitch shall be required, and not less than two hundred and ten (210) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing.

For four (4) ply construction five (5) alternating moppings of Pitch shall be required, and not less than one hundred and seventy-five (175) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing.

For three (3) ply construction four (4) alternating moppings of Pitch shall be required, and not less than one hundred and forty (140) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing.

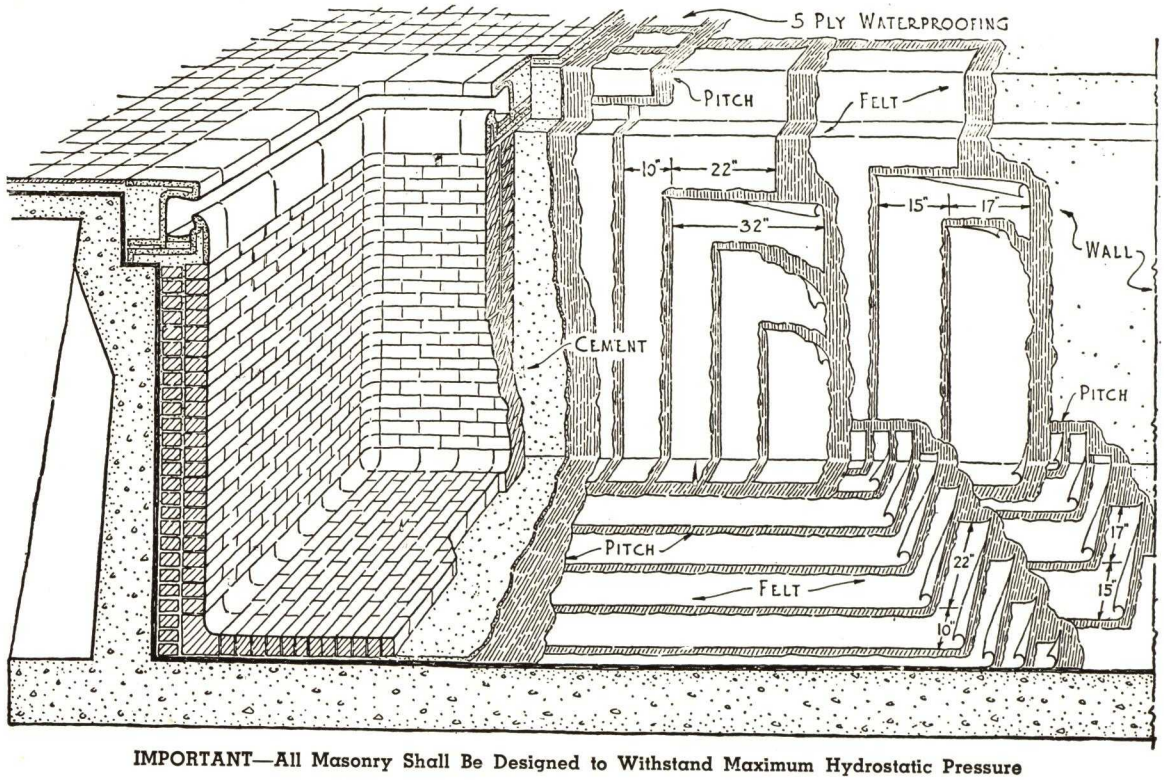


DETAIL FOR 3 PLY CONSTRUCTION



DETAIL FOR 4 PLY CONSTRUCTION

MEMBRANE METHOD FOR SWIMMING POOLS, SHOWER ROOMS, ETC.



IMPORTANT—All Masonry Shall Be Designed to Withstand Maximum Hydrostatic Pressure

SPECIFICATION

Note—The waterproofing shall be applied by a waterproofing contractor approved by THE BARRETT COMPANY, who has had experience in successfully applying this type of built-up waterproofing on swimming pool construction and who can refer to work of a similar nature that he has executed in a satisfactory manner.

PREPARATION OF SURFACES—All surfaces on which the waterproofing is to be applied shall be firm, smooth and dry, and free from loose materials, and shall be covered by a membrane of continuous waterproofing consisting of five (5) plies of Barrett Tarred Felt, as specified, and six (6) moppings of Barrett Waterproofing Pitch.

APPLICATION OF WATERPROOFING—**First**—Coat the entire surface on which the waterproofing is to be applied with Barrett Waterproofing Pitch into which, while hot, lay two (2) plies of Barrett Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Barrett Waterproofing Pitch the full seventeen (17) inch lap on each sheet, so that in no place shall Felt touch Felt.

Second—Coat the entire surface uniformly with Barrett Waterproofing Pitch into which, while hot, lay three (3) plies of Barrett Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Barrett Waterproofing Pitch the full twenty-two (22) inch lap on each sheet, so that in no place shall Felt touch Felt. All Felt shall be thoroughly and smoothly embedded into the hot Pitch, shall be laid without wrinkles or buckles, and the finished membrane shall be free from pockets or blisters.

Third—Coat the entire surface with a heavy, uniform mopping of Barrett Waterproofing Pitch.

Fourth—Not less than two hundred and ten (210) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

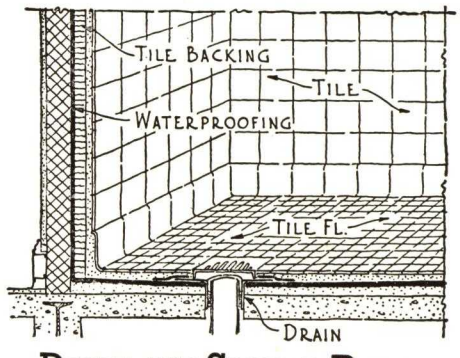
Fifth—At wall angles and footings and places where the waterproofing may be subjected to unusual strain, there shall be applied not less than two (2) extra reinforcing layers of Felt and alternating moppings of Pitch.

Sixth—Where laps are left to be connected, they shall be not less than ten (10) inches wide and shall be temporarily protected by one-half (½) inch troweled course of Portland Cement Mortar. When connections with laps are made, laps shall be carefully cleaned, dried, and mopped with Pitch before proceeding with the work.

Seventh—Care shall be taken not to injure the waterproofing membrane either during application or after completion, and all finished work shall be approved before construction of permanent protective finish.

Eighth—The waterproofing shall be immediately protected by tile, brick, concrete or similar material (as specified) and a continuous course of at least one-half (½) inch of Portland Cement Mortar, one (1) to two (2) mix, applied directly over the waterproofing membrane before such finished course is installed.

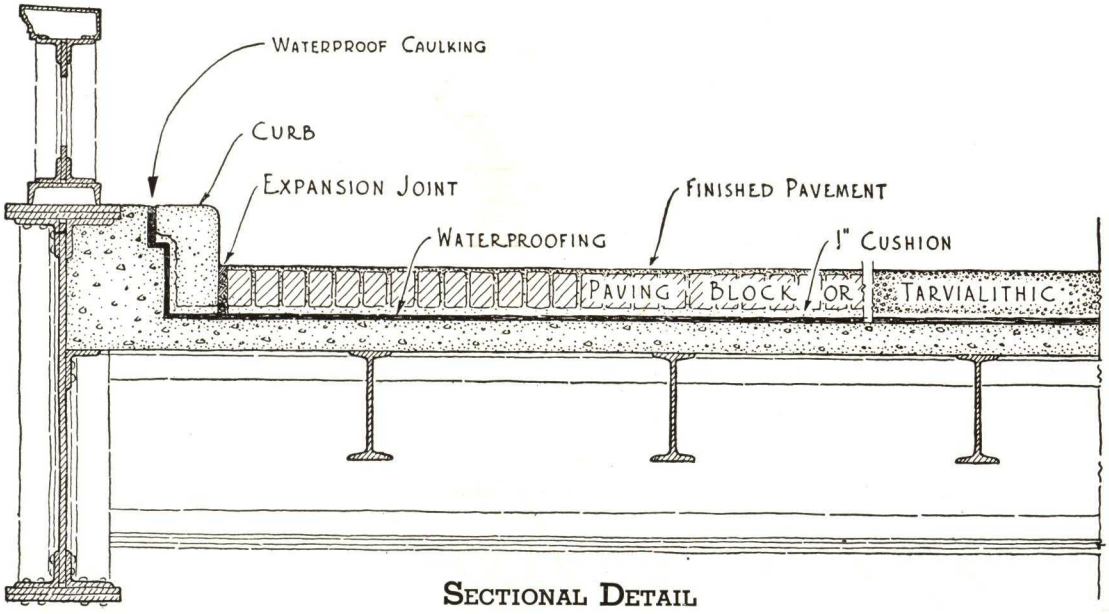
Note—Where swimming pool is provided with steam coil or hot water inlet, all such pipes shall be thoroughly insulated.



DETAIL FOR SHOWER ROOM

MEMBRANE METHOD FOR ELEVATED HIGHWAYS OR BRIDGES, RAMPS, ETC.

Barrett SINCE 1854



SECTIONAL DETAIL

This specification covers application for waterproofing membrane of pitch and felt. For alternate types and details, see page 52.

SPECIFICATION

Note—The waterproofing shall be applied by a Waterproofing Contractor approved by THE BARRETT COMPANY, who has had experience in successfully applying this type of Built-Up Waterproofing, and who can refer to work of a similar nature that he has executed in a satisfactory manner.

PREPARATION OF SURFACES—All surfaces on which the waterproofing is to be applied shall be firm, smooth, dry, and free from loose materials, and shall be covered by a membrane of continuous waterproofing consisting of ..... plies of Barrett Tarred Felt, as specified and ..... moppings of Barrett Waterproofing Pitch.

APPLICATION OF WATERPROOFING—First—Coat the entire surface on which the waterproofing is to be applied, with Barrett Waterproofing Pitch, into which, while hot, embed a layer of Barrett Tarred Felt, following this with alternating moppings of Pitch and layers of Felt until ..... moppings of Pitch and ..... layers of Felt have been applied. Each layer of Felt shall be thoroughly rubbed into the hot Pitch, and the entire surface shall be immediately mopped with Pitch to insure thorough embedment of the Felt. The Felt shall be laid without wrinkles or buckles, and the finished membrane shall be free from pockets or blisters.

Second—Spread over the entire surface a heavy, uniform coating of Barrett Waterproofing Pitch.

Third—Not less than .....* pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing, and the Pitch shall not be heated above three hundred and fifty (350) degrees Fahrenheit.

Fourth—At wall angles, curbs, deflection joints, and places where the waterproofing may be subjected to unusual strain, there shall be applied not less than two (2) extra reinforcing layers of Felt and alternating moppings of Pitch.

Fifth—Where laps are left to be connected, they shall be not less than ten (10) inches wide and shall be temporarily protected by one-half (½) inch troweled course of Portland Cement Mortar. When connections with laps are made, laps shall be carefully cleaned, dried, and mopped with Pitch before proceeding with the work.

Sixth—Felt and Pitch membrane shall be carried up curbs, walls, and areas around columns, pipes, etc., not less than four (4) inches above the finished wearing surface.

Seventh—Care shall be taken not to injure the waterproofing membrane either during application or after completion, and all finished work shall be approved before construction of permanent finished wearing surface.

Eighth—The finished wearing surface as specified shall be immediately installed over the waterproofing membrane.

Note No. 1—Expansion joints shall be provided throughout the finished wearing surface. All such expansion joints shall extend from the top of the finished wearing surface through to the waterproofing membrane.

Note No. 2—Where outlets or scuppers are provided as indicated on drawings, they shall be placed level with the waterproofing course and properly Felt-stripped.

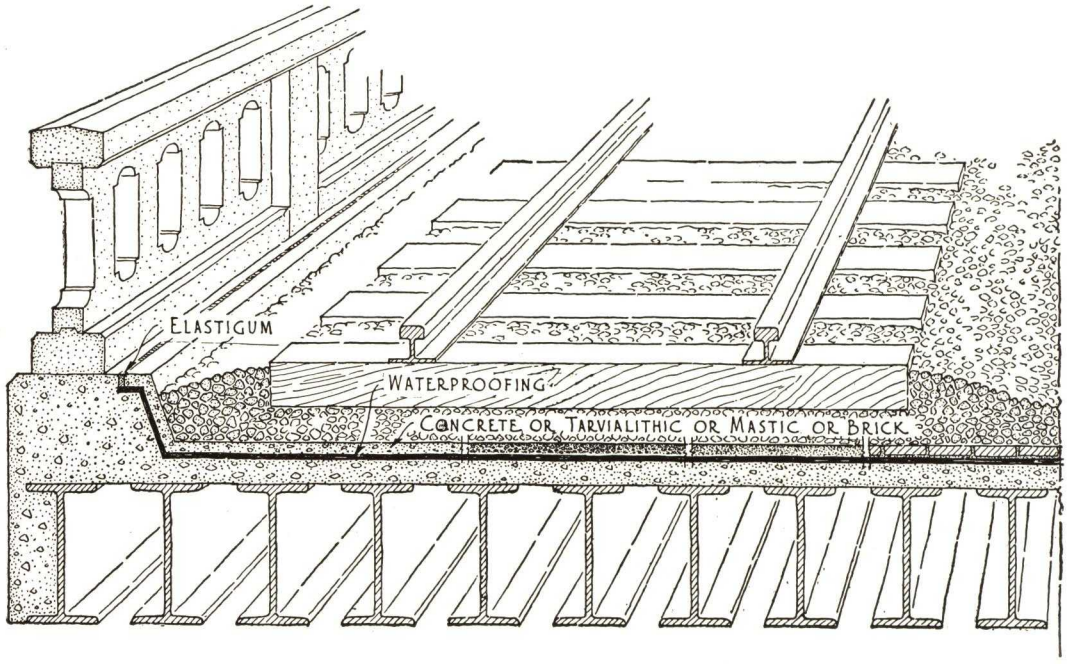
****Architect's Note***—For five (5) ply construction, Felt shall be laid after the two (2), two (2) and one (1) method, with alternating moppings of Waterproofing Pitch throughout. Not less than two hundred and ten (210) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed Waterproofing.

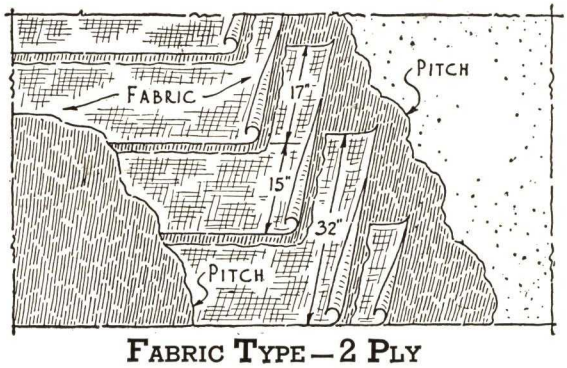
For four (4) ply construction not less than one hundred and seventy-five (175) pounds of Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed Waterproofing.

West Side Elevated Express Highway, New York, N. Y.
750,000 sq. ft. of Barrett waterproofing

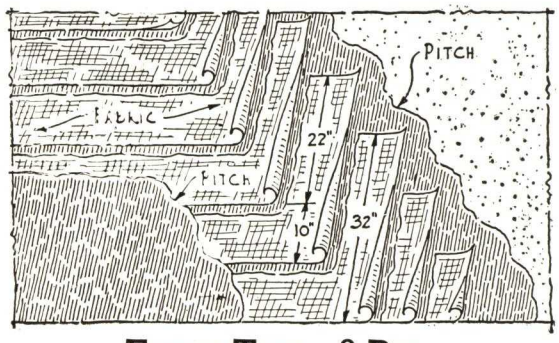
BARRETT WATERPROOFING SYSTEM

MEMBRANE METHOD FOR SOLID DECK RAILROAD BRIDGES

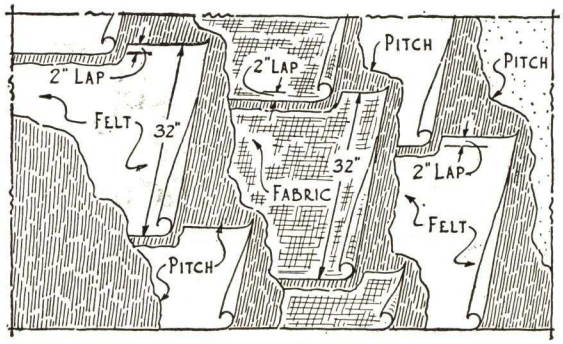




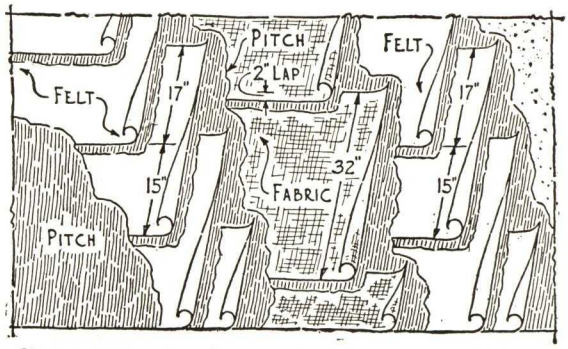
FABRIC TYPE—2 PLY



FABRIC TYPE—3 PLY



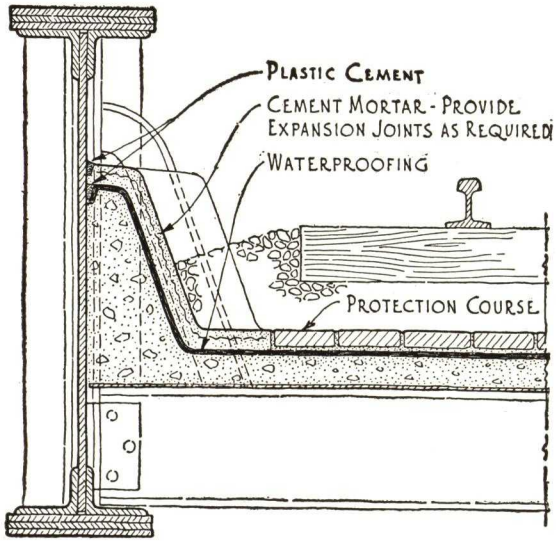
COMBINATION FELT & FABRIC—3 PLY



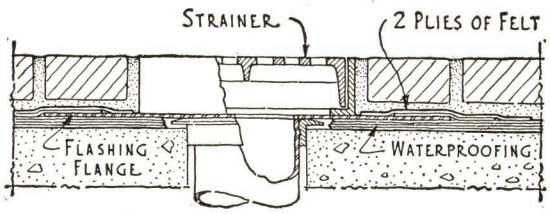
COMBINATION FELT & FABRIC—5 PLY

FLASHING DETAILS FOR SOLID DECK RAILROAD BRIDGES

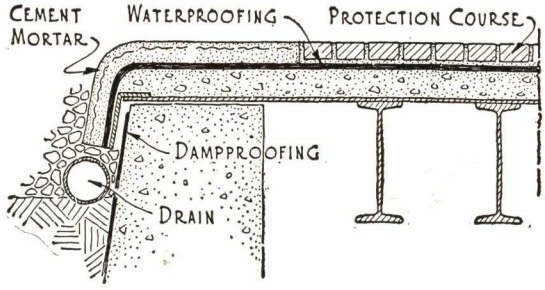
Barrett SINCE 1854



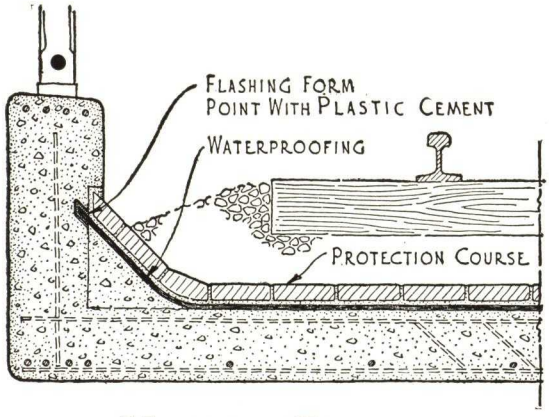
METHOD OF FLASHING AT STEEL GIRDERS



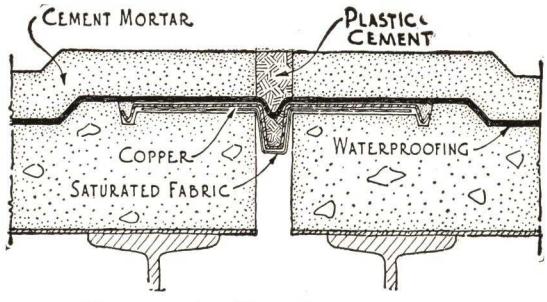
DETAIL OF DECK DRAIN



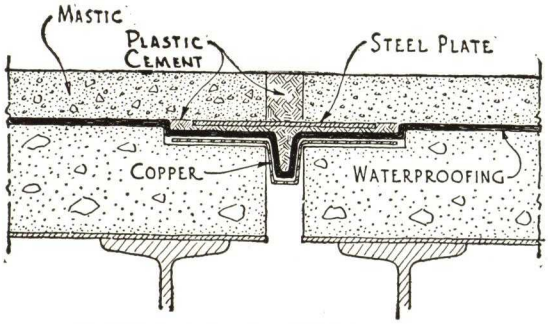
DETAIL OF WATERPROOFING AT EXPANSION END



METHOD OF FLASHING AT CONCRETE CURBS



DETAIL OF EXPANSION JOINT CONCRETE PROTECTION COURSE



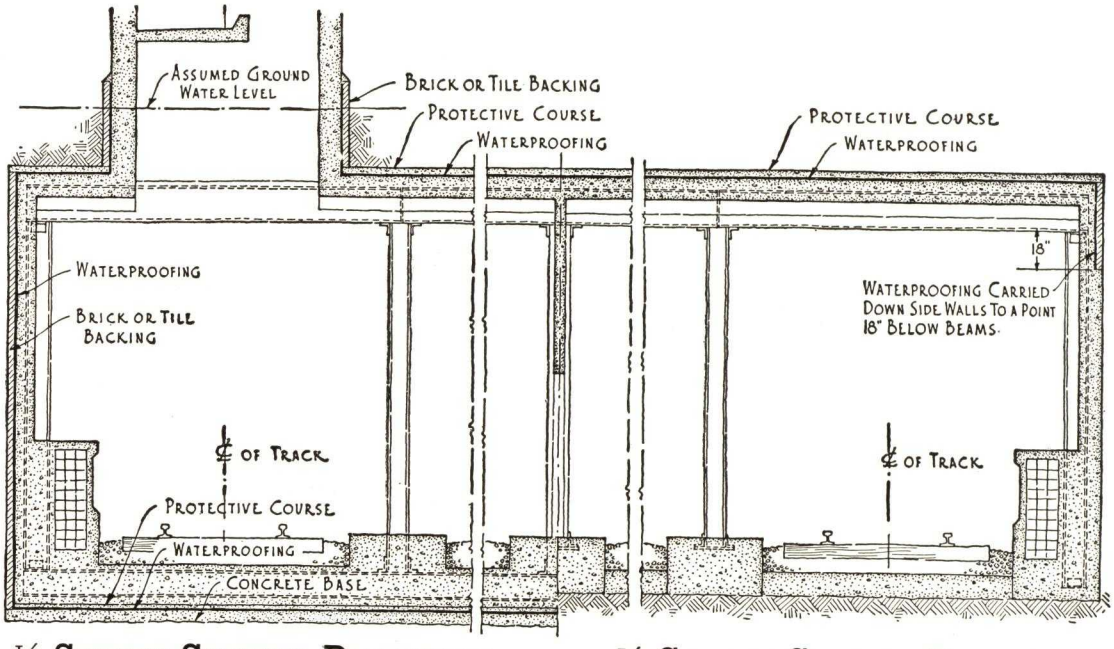
DETAIL OF EXPANSION JOINT MASTIC PROTECTION COURSE

The membrane method of waterproofing is recommended for use on solid deck railroad bridges or other bridges, ramps, highways, etc.

The types detailed conform to methods recommended by the American Railway Engineering Association, and incorporate the use of Barrett Waterproofing Pitch and/or Tarred Felt and/or Waterproofing Fabric.

Architect or Engineer shall clearly indicate type to be used and specifications shall follow A.R.E.A. standards or form as outlined on page 51.

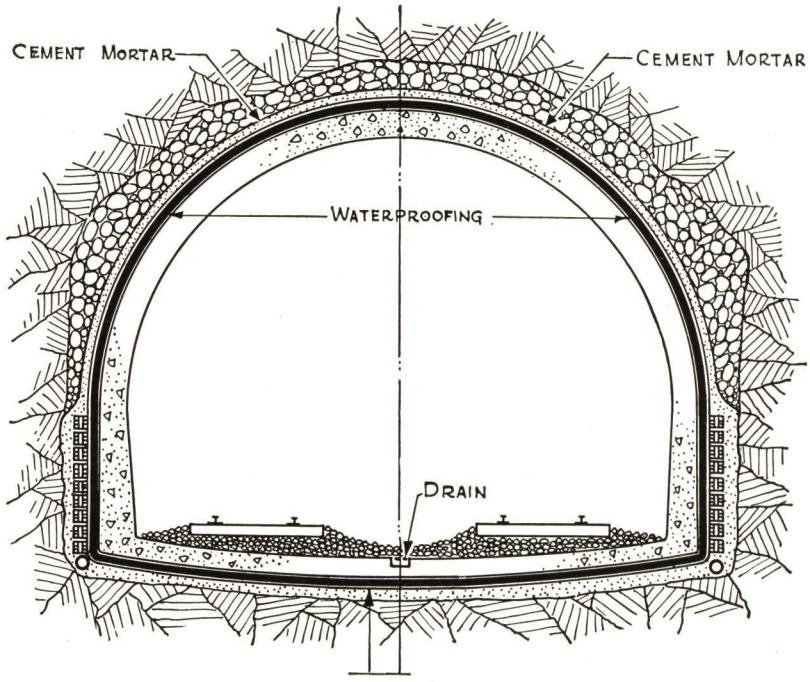
MEMBRANE METHOD FOR UNDERGROUND SUBWAYS, TUNNELS, ETC.



½ SECTION SHOWING PROTECTION AGAINST WATER PRESSURE

½ SECTION SHOWING PROTECTION AGAINST SURFACE WATER

TYPICAL SUBWAY SECTIONS

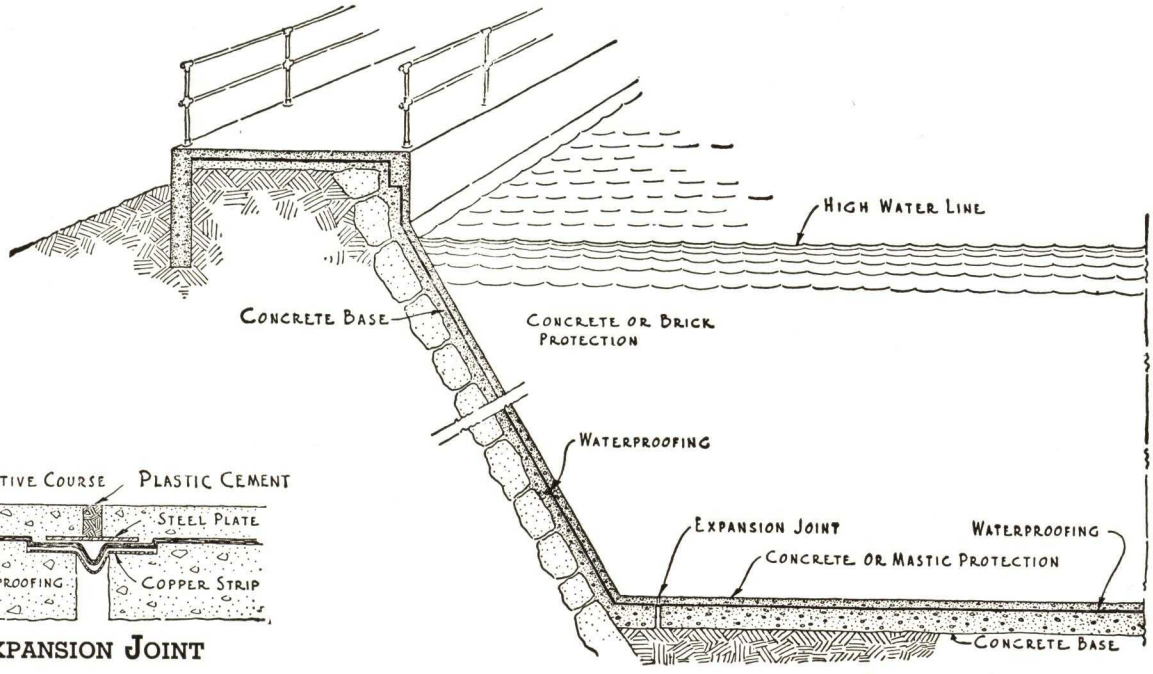


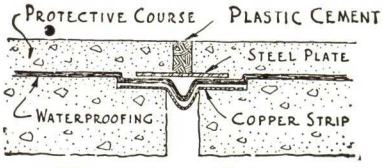
TYPICAL TUNNEL SECTION

Note—For types of membrane waterproofing and specification form, refer to pages 49 and 51.

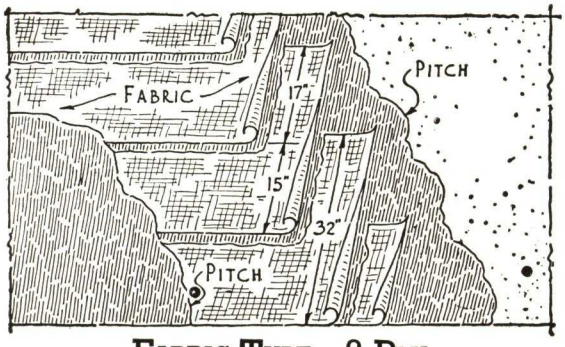
MEMBRANE METHOD FOR RESERVOIRS, BASINS, ETC.

Barrett SINCE 1854

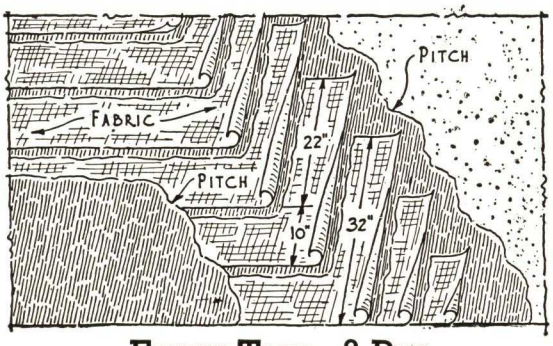




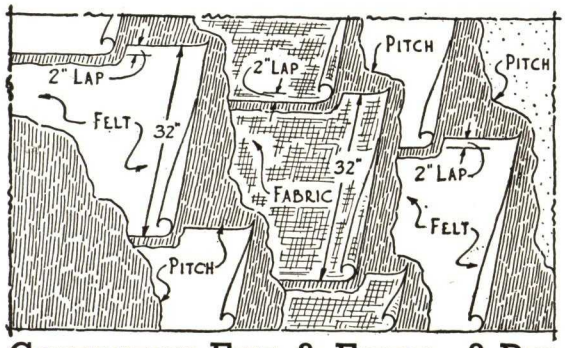
EXPANSION JOINT



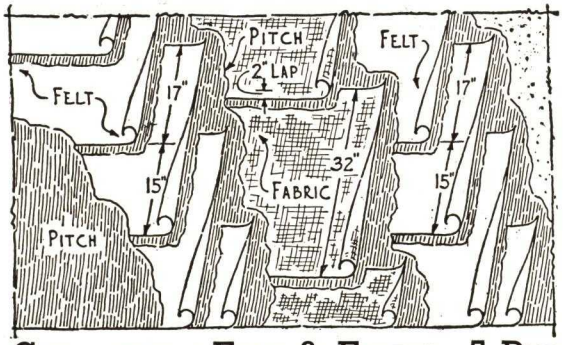
FABRIC TYPE—2 PLY



FABRIC TYPE—3 PLY



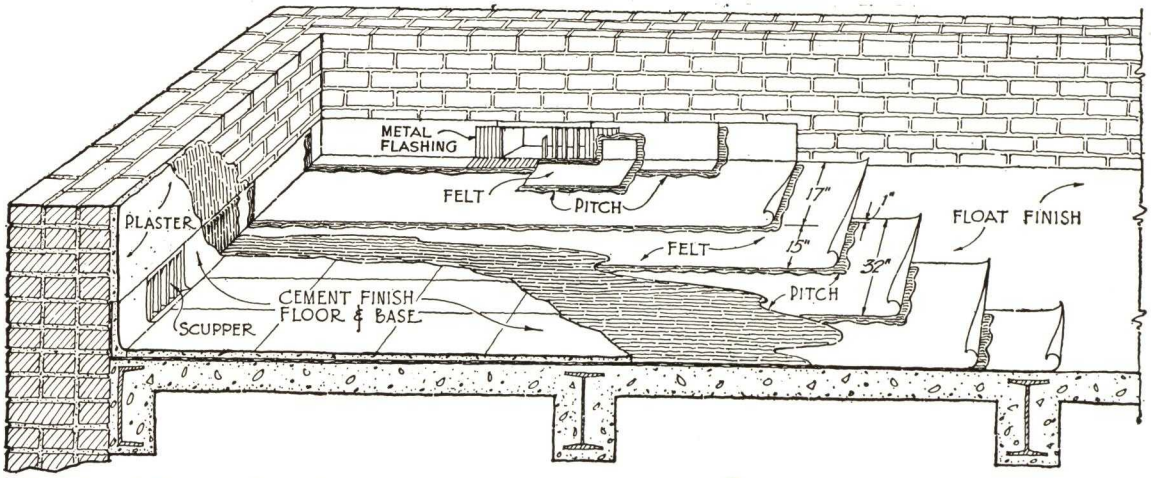
COMBINATION FELT & FABRIC—3 PLY



COMBINATION FELT & FABRIC—5 PLY

Note—For additional types of membrane waterproofing and specification form, refer to page 50.

MEMBRANE METHOD FOR SUPERSTRUCTURE, CONCRETE OR WOOD FLOORS



This System of Waterproofing is Designed for the Purpose of Providing a Factor of Safety Against Water Damage From Operation of Sprinkling System, or in Case of Fire, Washing of Floors, etc.

SPECIFICATION

First—Over the entire surface lay two (2) plies of Barrett Tarred Felt, as specified, lapping each sheet seventeen (17) inches over preceding one, mopping with Barrett Waterproofing Pitch to within one (1) inch of upper edge, after which spread over the entire surface a heavy, uniform coating of Specification Pitch.

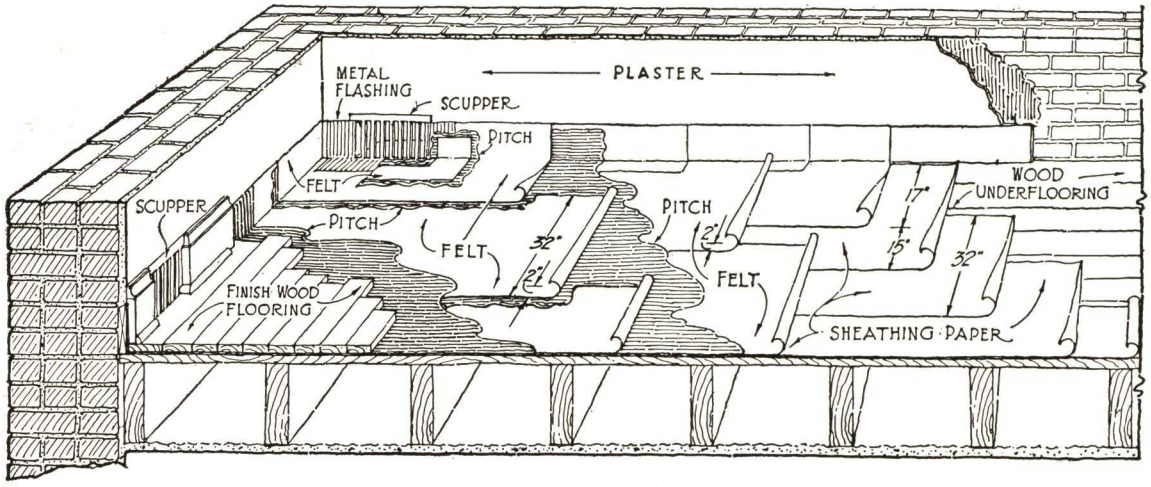
Second—Not less than sixty (60) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

Third—At places where the waterproofing may be subjected to unusual strain, there shall be applied not less than two (2) extra reinforcing layers of Felt and alternating moppings of Pitch.

Fourth—Felt and Pitch membrane shall be carried up walls and areas around columns, pipes, etc., not less than three (3) inches above the finished flooring, and shall be properly fastened in place and protected.

Fifth—Care shall be taken not to injure the waterproofing membrane either during application or after completion, and all finished work shall be approved before construction of permanent finished flooring.

Sixth—The waterproofing shall be immediately protected by the application of the finished flooring as specified.



SPECIFICATION

First—Over the entire surface lay two (2) thicknesses of sheathing paper or unsaturated felt, weighing not less than five (5) pounds per one hundred (100) square feet, lapping each sheet seventeen (17) inches over the preceding one, and nail as often as is necessary to hold in place.

Second—Over the entire surface lay one (1) ply of Barrett Tarred Felt as specified, lapping each sheet two (2) inches over preceding one and nail as often as is necessary to hold in place.

Third—Coat the entire surface uniformly with Barrett Waterproofing Pitch, after which over the entire surface lay one (1) ply of Barrett Tarred Felt, lapping each sheet two (2) inches over preceding one, and mopping the two (2) inch lap on each sheet with Barrett Waterproofing Pitch, so that at no place shall Felt touch Felt. Care shall be taken that all layers of Felt break joints with underlying layers.

Fourth—Over the entire surface spread a heavy, uniform coating of Barrett Waterproofing Pitch, into which, while hot, embed floor plank.

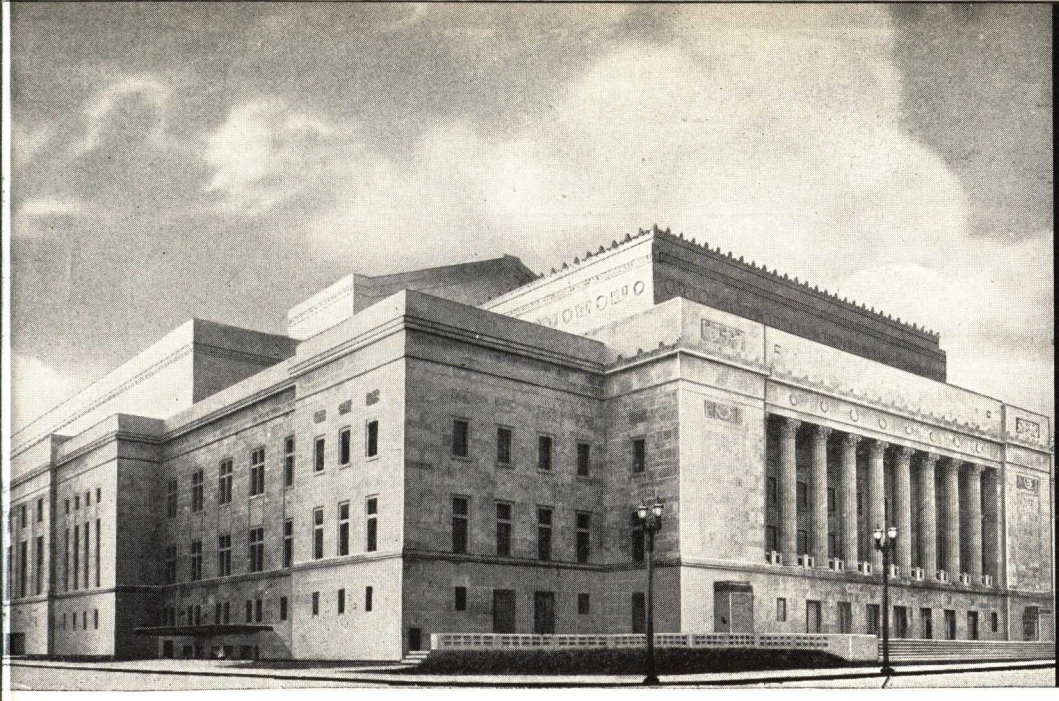
Fifth—Not less than sixty (60) pounds of Barrett Waterproofing Pitch shall be used for constructing each one hundred (100) square feet of completed waterproofing, and the pitch shall not be heated above four hundred (400) degrees Fahrenheit.

Sixth—(Same as paragraph "Third" above).

Seventh—(Same as paragraph "Fourth" above).

Eighth—(Same as paragraph "Fifth" above).

Ninth—The waterproofing shall be immediately protected by the application of the finished flooring as specified. Each plank shall be set in permanent position before nailing to prevent the nails from tearing the waterproofing membrane, and in no case shall the nails penetrate the flooring upon which the waterproofing rests.



SECTION 6

DAMPPROOFING AGAINST MOISTURE

DAMPPROOFING ABOVE OR BELOW GRADE

First National Bank, New York, N. Y.
Roofed, waterproofed and dampproofed with Barrett materials

Protecting Against Dampness

Dampproofing is designed to prevent the penetration of moisture or dampness, and may be distinguished from waterproofing in that constant "heads" or hydrostatic pressures are not involved.

Dampproofing may be generally visualized as applying to walls or surfaces exposed to moisture above grade, and to substructure surfaces where dampness—and not hydrostatic pressure—exists. The materials or methods employed should provide for the primary function of dampproofing systems, that of keeping walls dry, and should prevent discoloration.

Interior Coatings and Plaster Bond

Interior finishes should provide for the securing of a firm bond between the walls, to which the dampproofing is applied, and the succeeding coats of plaster or other interior wall finish.

Tested Methods

The dampproofing products and application methods referred to in these pages have been developed out of extensive research and experience. They provide for a continuity of covering, retard discoloration and assure a firm bond. The specifications outlined are accepted as standard practice—adaptable to structures during construction or after erection. Best results may be obtained by following the specification procedure outlined and by the employment of experienced applicators in the execution of the work.

FOR DAMPPROOFING FOUNDATION WALLS, RETAINING WALLS AND ABUTMENTS
Pitch Coating Method and Hydronon Method

SPECIFICATION FOR PITCH COATING METHOD

CONDENSED SPECIFICATION

All exterior surfaces and footings, of foundation walls, retaining walls and abutments shall be dampproofed by the application of one (1) priming coat of Carbosota and two (2) moppings of Waterproofing Pitch, both applied in strict accordance with the specifications published by THE BARRETT COMPANY.

COMPLETE SPECIFICATION

PREPARATION OF SURFACES—All surfaces to be dampproofed shall be dry and clean and free from dirt, dust or foreign materials. All voids, cracks or open joints in the masonry shall be properly pointed up with Portland Cement Mortar before application of the dampproofing materials.

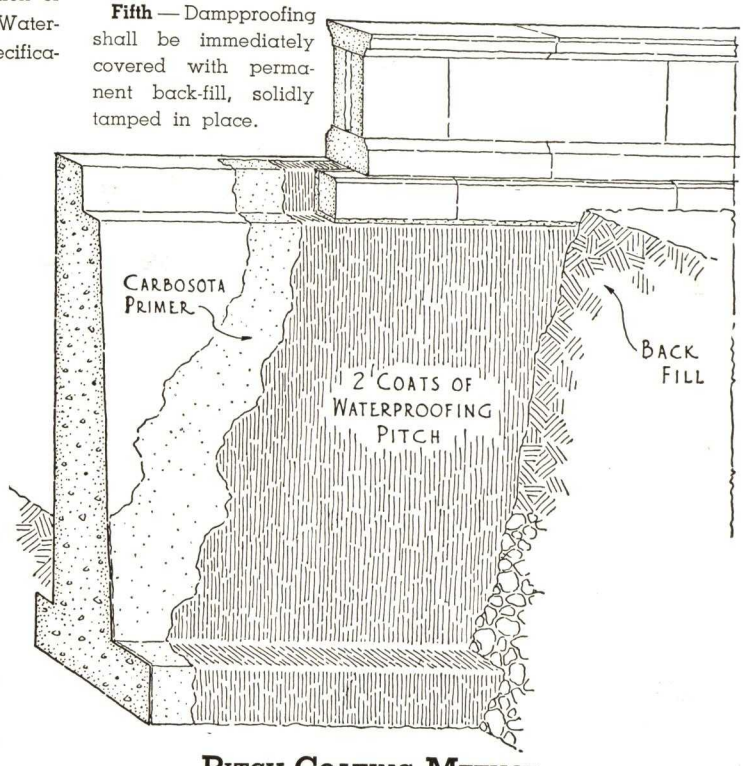
APPLICATION OF DAMPPROOFING—First—Apply over the entire surface to be dampproofed, a uniform priming coat of Barrett Carbosota, Grade 1, Creosote Oil.

Second—The priming coat of Carbosota shall be allowed to sufficiently penetrate the masonry, and before thoroughly dry, apply a uniform mop coating of Specification Waterproofing Pitch. The Pitch shall be applied in such manner as will obtain a heavy, continuous coating of Waterproofing Pitch over the entire surface, filling all cracks, voids and crevices and upon completion shall present a dry, glossy appearance.

Third—After the entire surface has been completely covered with the first mopping, follow immediately with second heavy, uniform mopping of Specification Waterproofing Pitch.

Fourth—Not less than one (1) gallon of Carbosota and eighty (80) pounds of Waterproofing Pitch shall be used for each one hundred (100) square feet of completed dampproofing and the Pitch shall not be heated above three hundred and fifty (350) degrees Fahrenheit.

Fifth — Dampproofing shall be immediately covered with permanent back-fill, solidly tamped in place.



PITCH COATING METHOD

SPECIFICATION FOR HYDRONON METHOD

CONDENSED SPECIFICATION

All exterior surfaces and footings of foundation walls, retaining walls and abutments shall be dampproofed by the application of two coats of Barrett Hydronon, applied in strict accordance with the specifications published by THE BARRETT COMPANY.

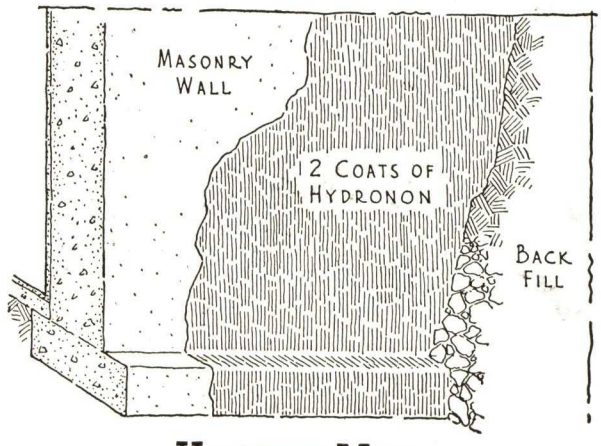
COMPLETE SPECIFICATION

PREPARATION OF SURFACES—All masonry surfaces to which Hydronon is to be applied shall be thoroughly dry and free of all dirt, grease, excess cement mortar or other foreign matter that might interfere with its adhesion and penetration. Any open areas in the concrete caused by segregation of coarse aggregates shall be filled in. Rubblestone construction shall be brought to an even surface with cement mortar. All holes and voids in masonry construction shall be carefully filled with Portland Cement Mortar, and all joints struck flush.

APPLICATION OF DAMPPROOFING—First—The exterior surfaces and footings of foundation walls, retaining walls and abutments, shall be dampproofed by the application of two (2) coats of Barrett Hydronon applied either by brush or by spray.

Second—The Hydronon shall be applied thoroughly and evenly from the footings to the soil or grade level so that all surfaces present a uniform black appearance. The second coat shall be brushed or sprayed at right-angles to the first coat so as to assure thorough coverage of the entire surface with a continuous impervious film without holidays, pinholes or spots.

Third—Twenty-four (24) hours shall elapse between the first and second coats. Back-filling of the soil, where required, shall be commenced not more than seven (7) days nor less than one (1) day after the final application of Hydronon.

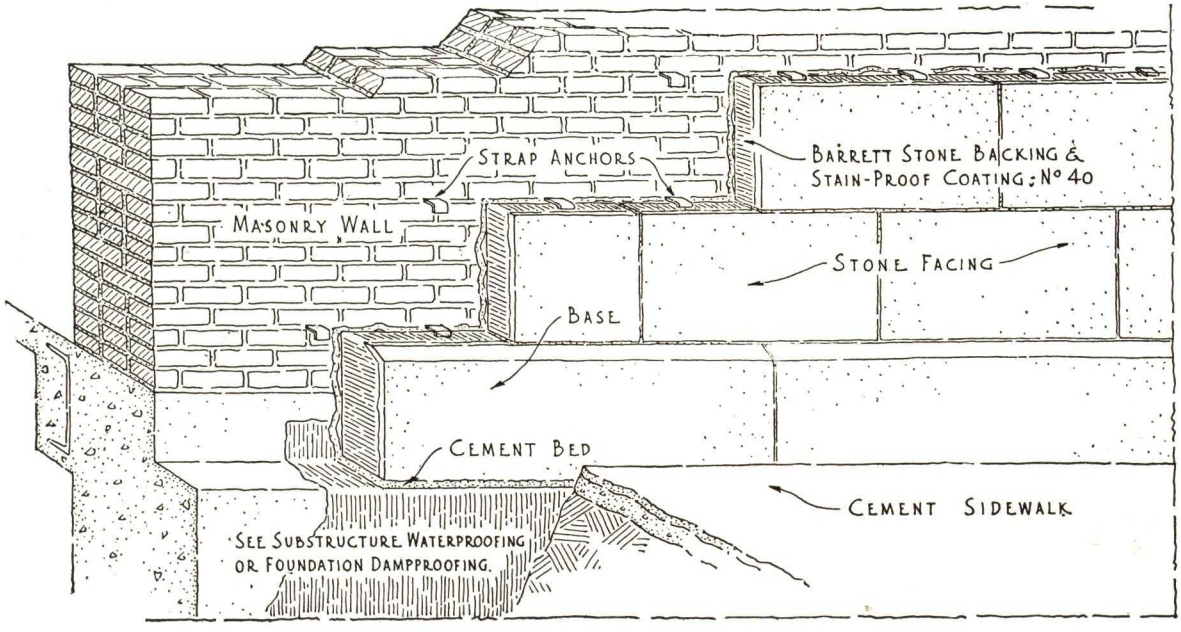


HYDRONON METHOD

STONE BACKING AND STAINPROOFING FOR EXTERIOR FACE STONE

Barrett Stone Backing & Stainproof Coating No. 40

Barrett SINCE 1854



DETAIL OF COATED STONE BEFORE SETTING

SPECIFICATION

CONDENSED SPECIFICATION

All exterior face stone shall be given one (1) thorough coat of Barrett Stone-Backing and Stainproof Coating No. 40, applied to the back and sides of each stone in strict accordance with the specifications published by THE BARRETT COMPANY.

COMPLETE SPECIFICATION

First—All exterior face stone shall be given one (1) thorough coat of Barrett Stone-Backing and Stainproof Coating No. 40, applied either by brush or compressed air spray, to the top, bedding, back and sides of each stone to within one (1) inch of its outer edge. All Lewis holes and anchor recesses shall be thoroughly coated before setting the stones in place.

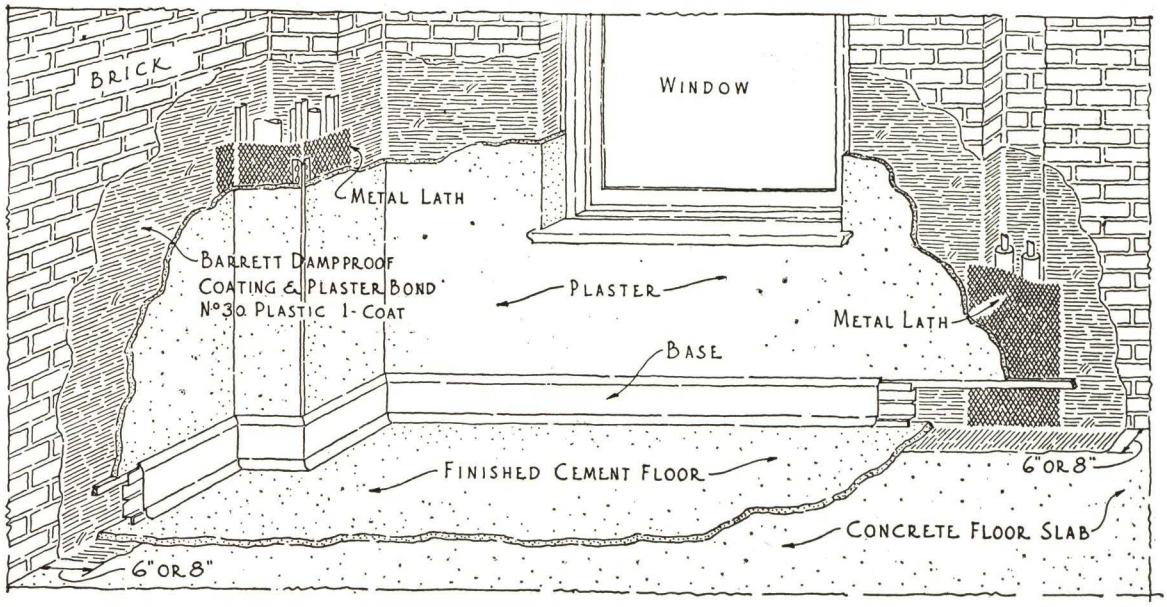
Second—The surfaces of the stone to be stainproofed shall be dry, and free from any oil, grease, or other foreign matter that might interfere with the proper adhesion and penetration of the coating.

Third—Where the stones are treated at the quarry, each unit before being set in place on the job, shall be examined for breaks in the coating and touched-up where required.

Fourth—At least twelve (12) hours shall elapse between the application of the Stainproof Coating and the setting of the stone.

Architect's Note—Barrett Stone-Backing and Stainproof Coating is a dampproofing and protective coating whose use is defined in its name. It is applied to the back and four sides of stone and cast stone used for the facing of buildings, such as marble, limestone, Bedford stone, etc. It effectively prevents the staining and discoloration of the stone frequently caused by the chemical reaction set up by the lime present in cement mortar.

DAMPPROOF COATING AND PLASTER BOND FOR MASONRY WALLS ABOVE GRADE. PLASTIC TYPE.



CONDENSED SPECIFICATION

The interior surfaces of all exterior walls of brick (or hollow tile), above grade, shall be dampproofed with Barrett Dampproof Coating and Plaster Bond No. 30 Plastic, applied in one trowel coat, in strict accordance with the specifications published by THE BARRETT COMPANY.

COMPLETE SPECIFICATION

MASONRY—All holes and voids in the wall surfaces to be dampproofed shall be carefully filled with Portland Cement Mortar and all joints struck flush. The walls shall be thoroughly dry, and free from oil, grease, excess cement mortar or other foreign matter that might interfere with the bonding and penetrating properties of the dampproof coating.

APPLICATION OF DAMPPROOFING—First—The interior surfaces of all exterior brick (or hollow tile) walls, including reveals of doors and windows, column coverings and pipe chases, shall be dampproofed with one (1) thorough and uniform trowel coat, of an average thickness of one-sixteenth (1/16) inch, using Barrett Dampproof Coating and Plaster Bond No. 30 Plastic.

Second—The single coat of Plastic Dampproofing shall be applied evenly and carefully, being thoroughly worked into all joints, crevices, cracks between mortar and brick, cut-outs, wall chases and recesses, so as to form a continuous, impervious coating without holidays, pinholes or brown spots.

Third—The Dampproof Coating shall be applied before any pipes or metal work are installed; and it shall completely cover the inside surfaces of all walls, as above, being carried out six (6) to eight (8) inches on rough floor slabs.

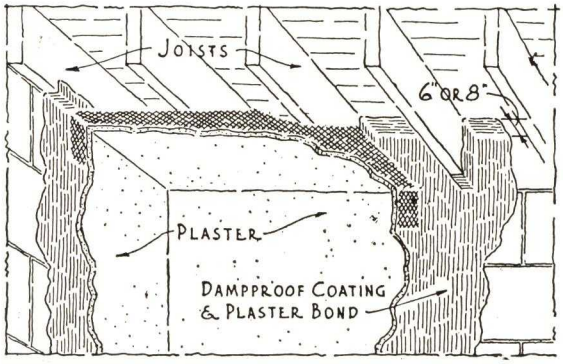
PLASTERING—The rough or scratch coat of wall plaster shall be applied directly to the dampproofing material not less than twenty-four (24) hours nor more than seven (7) days after the latter has been applied to the walls.

Note: Do not use Barrett Dampproof Coatings on ceilings. Where these materials are to be used in conjunction with stucco or Portland Cement Mortar wall finishes, special application instructions shall be obtained either from the Architect or from THE BARRETT COMPANY.

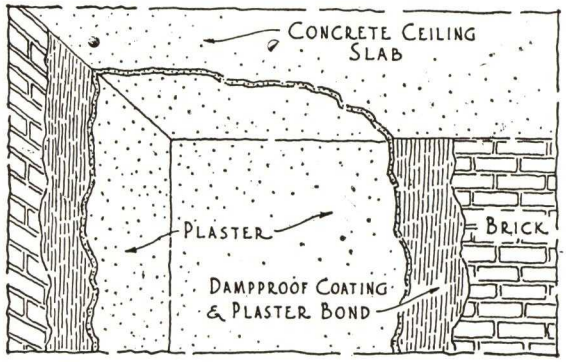
DAMPPROOF COATING & PLASTER BOND METHOD ABOVE GRADE

CONDENSED SPECIFICATION FOR EXTERIOR BRICK WALLS—The interior surfaces of all exterior brick walls, above grade, shall be dampproofed with Barrett Dampproof Coating and Plaster Bond No. 30 Plastic applied strictly in accordance with the specifications published by THE BARRETT COMPANY.

CONDENSED SPECIFICATION FOR HOLLOW TILE WALLS—The interior surfaces of all exterior walls of hollow tile, above grade, shall be dampproofed with one (1) coat of Barrett Dampproof Coating and Plaster Bond No. 30 Plastic applied strictly in accordance with the specifications published by THE BARRETT COMPANY.



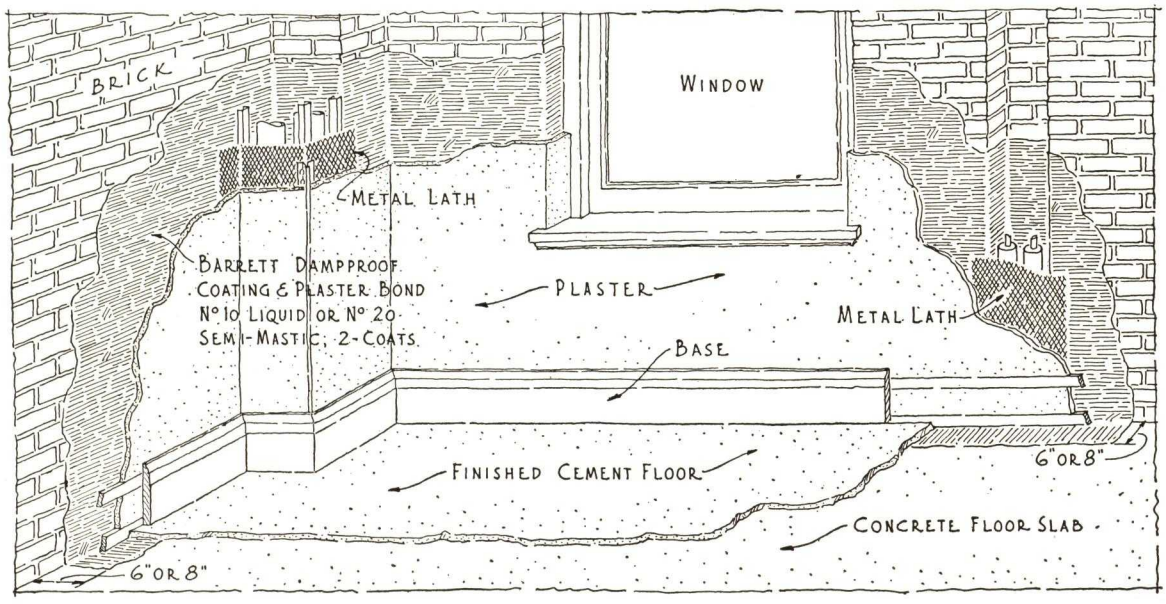
SHOWING DAMPPROOF COATING CARRIED OUT ON WOOD JOIST CEILING



SHOWING DAMPPROOF COATING CARRIED UP TO CEILING

DAMPPROOF COATING AND PLASTER BOND FOR MASONRY WALLS ABOVE GRADE. LIQUID COATING and SEMI-MASTIC TYPES.

Barrett SINCE 1854



PLASTER BOND METHOD FOR BRICK WALLS

Barrett Dampproof Coating and Plaster Bond No. 10 Liquid or No. 20 Semi-Mastic

CONDENSED SPECIFICATION

The interior surfaces of all exterior brick walls, above grade, shall be dampproofed with Barrett Dampproof Coating and Plaster Bond No. 10 Liquid (or No. 20 Semi-Mastic), applied strictly in accordance with the specifications published by THE BARRETT COMPANY.

COMPLETE SPECIFICATION

MASONRY—All holes and voids in the wall surfaces to be dampproofed shall be carefully filled with Portland Cement Mortar and all joints struck flush. The walls shall be thoroughly dry, and free from oil, grease, excess cement mortar or other foreign matter that might interfere with the bonding and penetrating properties of the dampproof coating.

APPLICATION ON DAMPPROOFING—First—The interior surfaces of all exterior walls of brick, including reveals of doors and windows, column coverings and pipe chases, shall be dampproofed with two (2) thorough applications of Barrett Dampproof Coating and Plaster Bond No. 10 Liquid, applied by brush or by compressed air spray (or with two (2) thorough applications of Barrett Dampproof Coating and Plaster Bond No. 20 Semi-Mastic, applied by heavy brush, mop or squeegee).

Second—The first coat shall be applied thoroughly and evenly until the surface presents a uniform black appearance, care being taken to completely coat all joints, crevices, cut-outs, wall chases and recesses, so as to form a continuous, impervious film without holidays, pinholes or brown spots.

Third—After the first coat of dampproofing has been applied, at least twelve (12) hours shall elapse before application of the final coat.

Fourth—The dampproofing shall be applied before any pipes or metal work are installed, and both coats shall completely cover the inside surfaces of all walls, as above, being carried out six (6) to eight (8) inches on rough floor slabs.

PLASTERING—The rough or scratch coat of wall plaster shall be applied directly to the final coat of dampproofing material, but not less than twenty-four (24) hours nor more than seven (7) days after the latter has been applied.

Note: Do not use Barrett Dampproof Coatings on ceilings. Where these materials are to be used in conjunction with stucco or Portland Cement Mortar wall finishes, special application instructions shall be obtained either from the Architect or from THE BARRETT COMPANY.

PLASTER BOND METHOD FOR HOLLOW TILE WALLS

Barrett Dampproof Coating and Plaster Bond No. 10 Liquid or No. 20 Semi-Mastic

CONDENSED SPECIFICATION

The interior surfaces of all exterior walls of hollow tile, above grade, shall be dampproofed with one (1) coat of Barrett Dampproof Coating and Plaster Bond (No. 10 Liquid, No. 20 Semi-Mastic, or No. 30 Plastic) applied strictly in accordance with the specifications published by THE BARRETT COMPANY.

COMPLETE SPECIFICATION

MASONRY—Same as for specification at top of page.

APPLICATION OF DAMPPROOFING—First—The interior surfaces of all exterior walls of hollow tile, including reveals of doors and windows, column coverings and pipe chases, shall be dampproofed with one (1) thorough application of Barrett Dampproof Coating and Plaster Bond (No. 10 Liquid, No. 20 Semi-Mastic or No. 30 Plastic).

Second—No. 10 Liquid shall be applied by brush or by compressed air spray. No. 20 Semi-Mastic shall be applied by heavy brush, mop or squeegee. No. 30 Plastic shall be applied by trowel to an average thickness of one-sixteenth (1/16) inch.

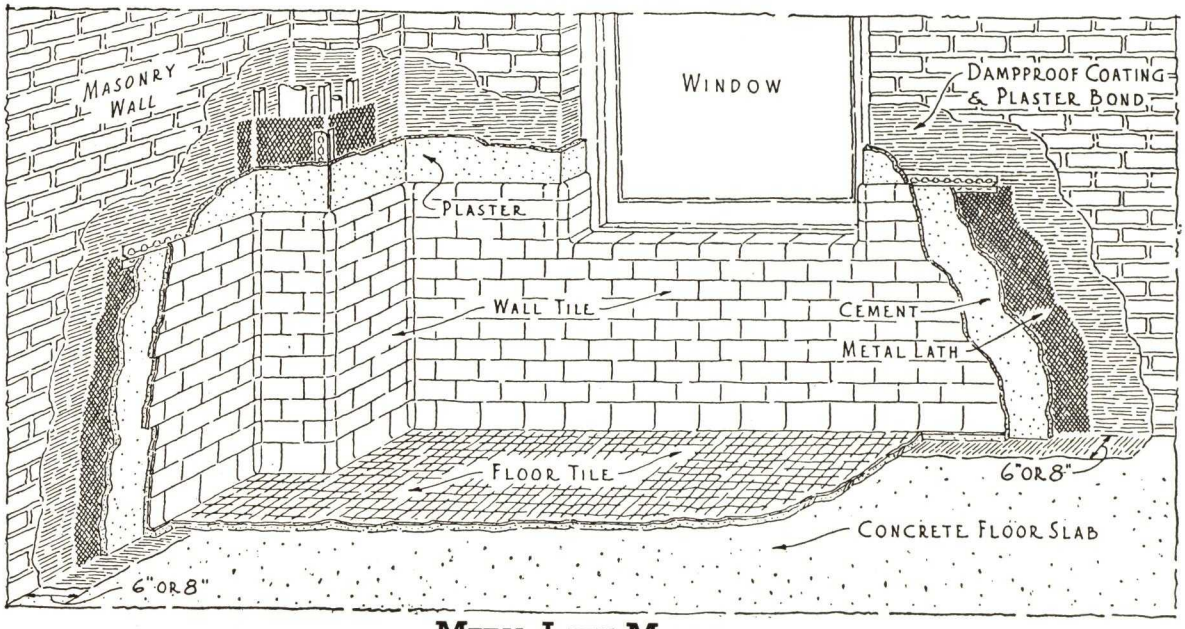
Third—The coating shall be applied thoroughly and evenly until the surface presents a uniform black appearance, care being taken to completely coat all joints, crevices, cut-outs, wall chases and recesses, so as to form a continuous, impervious film without holidays, pinholes or brown spots.

Fourth—Same as "Fourth" at top of page.

PLASTERING—Same as at top of page.

Note— Same as at top of page.

DAMPPROOF COATING AND PLASTER BOND FOR MASONRY WALLS ABOVE GRADE— TILE FINISH.



METAL LATH METHOD

SPECIFICATION

CONDENSED SPECIFICATION

The interior surfaces of all exterior walls of brick or hollow tile, which are to be finished in tile, shall be dampproofed with Barrett Dampproof Coating and Plaster Bond No. 10 Liquid, No. 20 Semi-Mastic or No. 30 Plastic, applied strictly in accordance with the specifications published by THE BARRETT COMPANY, metal lath, or metal clips being provided, as specified, as additional support for the finished tile walls.

COMPLETE SPECIFICATION

MASONRY—All holes and voids in the wall surfaces to be dampproofed shall be carefully filled with Portland Cement Mortar and all joints struck flush. The walls shall be thoroughly dry and free from oil, grease, excess cement mortar or other foreign matter that might interfere with the bonding and penetrating properties of the dampproof coating.

APPLICATION OF DAMPPROOFING—First—The interior surfaces of all exterior walls of brick, including reveals of doors and windows, column coverings and pipe chases, shall be dampproofed with two (2) thorough applications of Barrett Dampproof Coating and Plaster Bond No. 10 Liquid applied by brush or by compressed air spray; or with two (2) thorough applications of Barrett Dampproof Coating and Plaster Bond No. 20 Semi-Mastic applied by heavy brush, mop or squeegee; or by one (1) thorough trowel coat of Barrett Dampproof Coating and Plaster Bond No. 30 Plastic applied to an average thickness of one-sixteenth (1/16) inch.

Note: Where walls are of hollow tile, only one (1) coat of No. 10 Liquid or No. 20 Semi-Mastic shall be required.

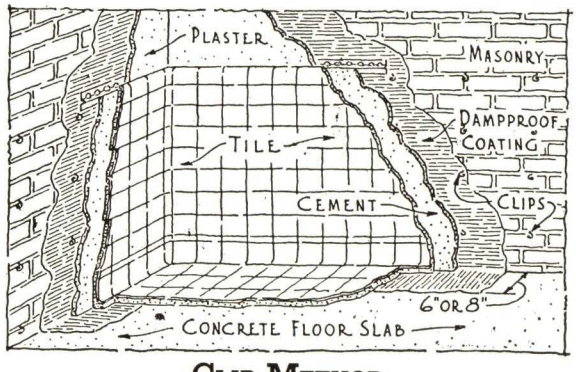
Second—The dampproofing shall be applied thoroughly and evenly until the surface presents a uniform black appearance, care being taken to completely coat all joints, crevices, cut-outs, wall chases, recesses, etc., so as to form a continuous, impervious film without holidays, pinholes or brown spots. The dampproof coating shall be applied before any pipes or metal work are installed and shall completely cover the inside surfaces of all walls, as above, being carried out six (6) to eight (8) inches on rough floor slabs.

Third—Where two (2) coats are required, at least twelve (12) hours shall elapse between the first and second applications.

METAL LATH—Metal lath, as specified by the Architect, shall be applied to all wall surfaces which have been dampproofed as above and which are to be finished with tile. In the case of pipe chases and cut-outs in which piping, conduits, or metal work have been installed, the metal lath shall be placed on the outside of and around such piping, conduits or metal work so that the lath will provide a backing for the reception of the wall tile and will partially support its weight.

APPLICATION OF TILE—The tile shall be applied to the metal lath, as above, by means of Portland Cement Mortar.

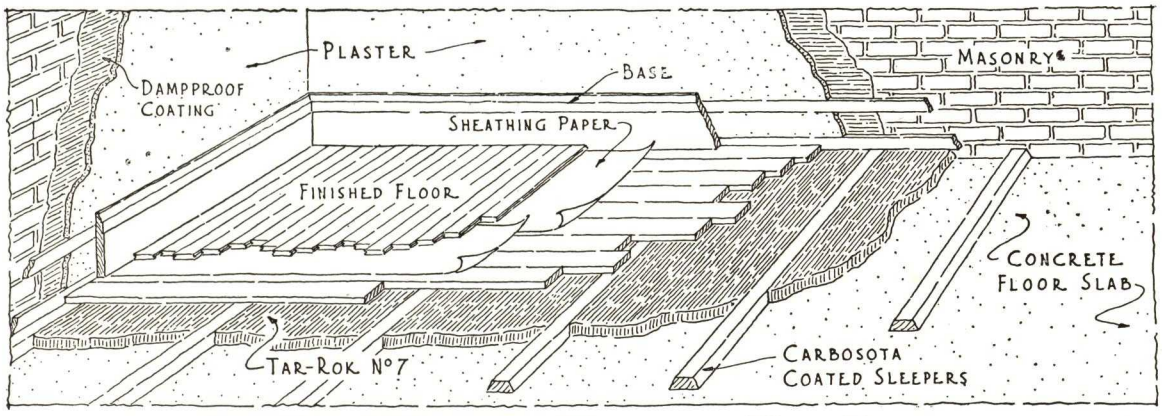
ALTERNATE OR CLIP METHOD—In this method, metal clips of a size, shape and spacing as may be specified by the Architect, are inserted into the brick or hollow tile wall as it is constructed. The dampproof coating is applied, as below, to the interior surfaces of the walls; and the tile set in cement mortar placed directly over the dampproof coating, the metal clips serving, in addition to the natural bonding properties of the dampproof coating, to partially support the tile.



CLIP METHOD

DAMPPROOFING AND WOOD PRESERVATIVE METHOD FOR FLOORS

Barrett SINCE 1854



TAR-ROK & CARBOSOTA METHOD FOR WOOD FLOORS

SPECIFICATION FOR TAR-ROK METHOD

CONCRETE FLOOR BASE—The concrete floor base shall be dry and leveled off to the proper grade.

WOOD SLEEPERS—All wood sleepers used in floor construction shall be given one preservative coating of Carbosota applied either by brush or by immersion, to permit thorough penetration into the wood. The wood sleepers shall then be fastened to the concrete floor base or slabs in the manner prescribed by the Architect.

DAMPPROOFING COURSE—First—A Tar-Rok dampproofing course shall be laid directly on the concrete floor base or slab to a thickness sufficient to bring it flush with the top edge of the sleepers after leveling with a straightedge.

Second—The dampproofing course shall consist of fine dry sand, thoroughly mixed with Barrett Sub-Floor Tar No. 7 in the proportion of not less than twenty-five (25) nor more than thirty (30) gallons of Tar to each cubic yard of sand. The sand shall be thoroughly dried before mixing; and both sand and Sub-Floor Tar shall be heated sufficiently to permit their mixing freely. Neither the sand nor the Tar shall be more than two hundred and twenty-five (225) degrees Fahrenheit when mixed together. If a thick white smoke arises from the mixture indicating that it is overheated, five (5) gallons more of the Tar shall be added to each cubic yard of sand.

Third—This mixture shall then be spread evenly to a thickness one-quarter (¼) to one-half (½) inch higher than the top level of the wood sleepers so that it will compact to a dampproofing layer exactly flush with the tops of the sleepers.

Fourth—The wood floor base or the finished cement floor shall then be laid directly on the dampproofing course and the flooring operation completed as prescribed by the Architect.

SPECIFICATION FOR HYDRONON METHOD

CONCRETE FLOOR BASE—First—The concrete floor base shall be dry and leveled off to the proper grade.

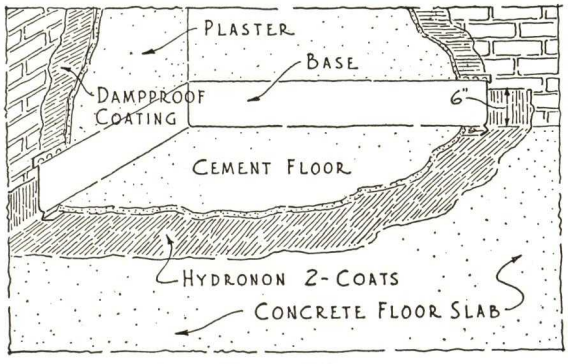
Second—Concrete shall be allowed to set for at least three (3) days before the dampproof coating is applied. Where high, early strength cements are used for floors which are to be loaded within twenty-four (24) to forty-eight (48) hours, the dampproof coating may be applied after the concrete has set for at least twenty-four (24) hours.

DAMPPROOFING—First—All floors shall be dampproofed by the application of two (2) coats of Barrett Hydronon to the concrete floor base; and the finished cement floor or wood sub-floor laid therein.

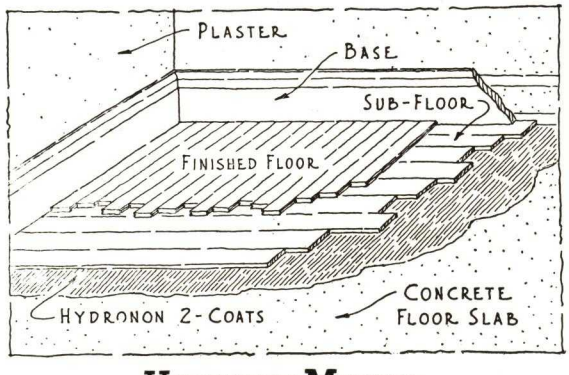
Second—The Hydronon shall be applied by brush in two (2) thorough and even coats directly over the concrete floor base until the entire surface presents a uniform black appearance. The second coat shall be brushed at right angles to the first coat so as to insure thorough coverage of the entire surface with a continuous, impervious film without breaks. Both coats shall be carried up on the surrounding walls, columns, etc., for a distance of at least six (6) inches.

Third—Twenty-four (24) hours shall elapse between the application of the first and second coats.

Fourth—Within twelve (12) hours after the application of the final coat of Hydronon, the finished cement floor or the wood sub-floor shall be laid as prescribed by the Architect.

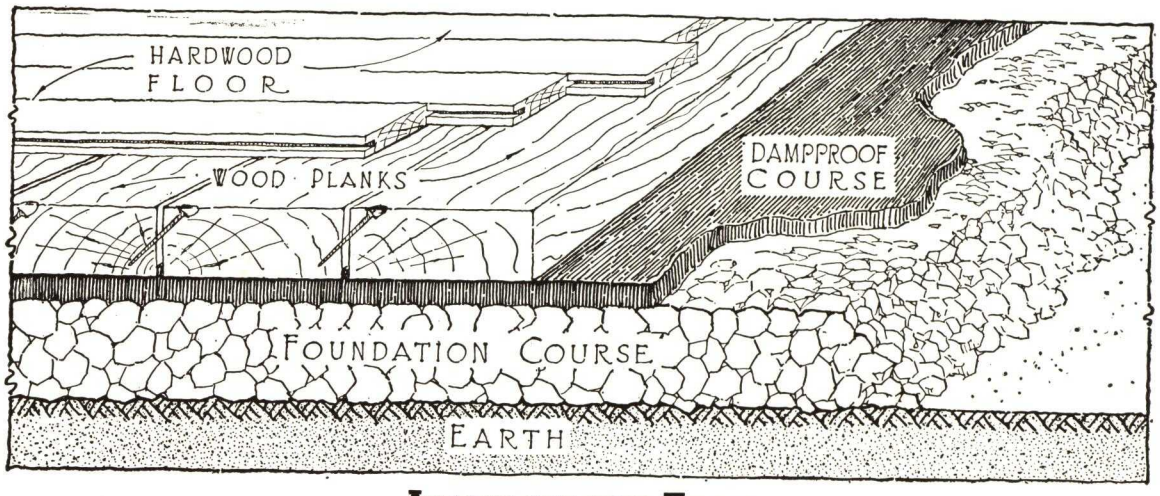


HYDRONON METHOD FOR CEMENT FLOORS



HYDRONON METHOD FOR WOOD FLOORS

DAMPPROOFING FOR USE UNDER WOOD FLOORS OVER EARTH OR OVER CONCRETE BASE.
Barrett Tar-Rok Method.



APPLICATION OVER EARTH

SPECIFICATION FOR APPLICATION OVER EARTH

GRADING—The general contractor for the building shall level off the earth to proper grade to receive the Tar-Rok, and if any filling is necessary it shall be properly puddled and rammed.

FOUNDATION COURSE—The foundation course shall consist of four (4) inch thickness of screened gravel or crushed stone, not any of which shall exceed two and one-half (2½) inches in longest dimension or be less than one-quarter (¼) inch in size, mixed with sufficient Barrett Sub-Floor Tar No. 5 (as specified) so that it will compact under a roller after being spread evenly in place. It shall then be rolled until the stones do not creep under the roller. The Tar for this course may be heated to not more than two hundred (200) degrees Fahrenheit, and in cold weather the stone shall be slightly warmed if necessary, so that the Tar will mix with the stone and the stone spread evenly. The roller used for this work shall weigh not less than three hundred (300) pounds to each foot in length. Sub-Floor Tar used in foundation course shall be approximately (See Note No. 1):

Six (6) gallons for each cubic yard of two and one-half (2½) inches to one (1) inch crushed stone;

Nine (9) gallons for each cubic yard of two and one-half (2½) inches to one-quarter (¼) inch crushed stone;

Seven (7) gallons for each cubic yard of coarse-screened gravel;

Ten (10) gallons for each cubic yard of fine-screened gravel.

Note No. 1—Only sufficient Tar should be used so that the stone or gravel will properly compact and provide a suitable surface for spreading the dampproof course.

DAMPPROOF COURSE—The dampproof course shall consist of a fine sand and thoroughly mixed with Barrett Sub-Floor Tar No. 7 in the proportion of not less than twenty-five (25) nor more than thirty (30) gallons of Tar to each cubic yard of sand. The sand shall be thoroughly dry before mixing, and both sand and Tar shall be heated sufficiently to make them mix freely, but neither sand nor Tar shall be hotter than two hundred and twenty-five (225) degrees Fahrenheit when being mixed together. If a thick, white smoke arises from the mixture, indicating it is overheated, five (5) gallons more Tar to each yard of sand shall be required. This mixture shall be spread evenly one and one-quarter (1¼) to one and one-half (1½) inches thick (so it will compact to one (1) inch) over the foundation, leveled with straight-edge, and followed closely with plank.

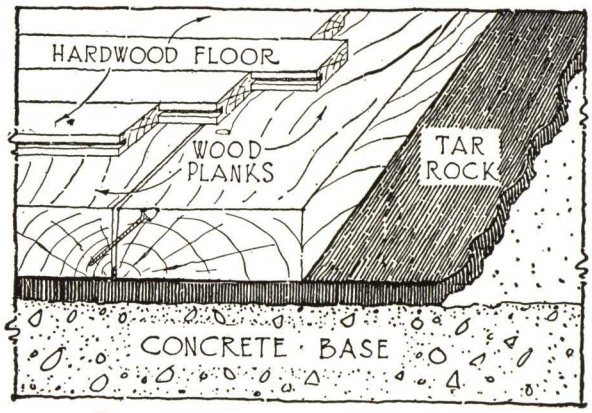
The plank shall be laid on this soft mixture, and bedded on it by hammering until the proper stability is obtained and the plank brought to a proper level and toe-nailed. If after hammering, any plank is below the proper level, the plank shall be taken up and more of the mixture spread on. (The plank and finished flooring shall be furnished and laid by other contractors.)

SPECIFICATION FOR APPLICATION OVER CONCRETE

GRADING—The general contractor for the building shall level off the concrete to proper grade to receive the Tar-Rok Dampproof course.

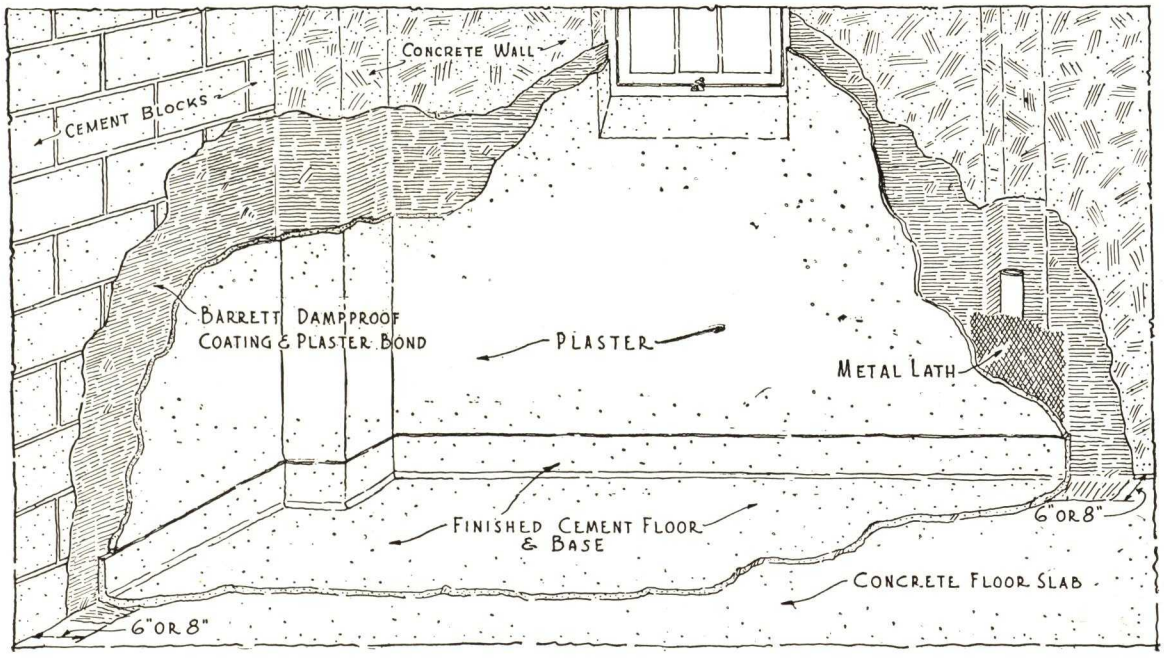
DAMPPROOF COURSE—The dampproof course shall consist of a fine sand thoroughly mixed with Barrett Sub-Floor Tar No. 7 in the proportion of not less than twenty-five (25) nor more than thirty (30) gallons of Tar to each cubic yard of sand. The sand shall be thoroughly dry before mixing, and both sand and Tar shall be heated sufficiently to make them mix freely, but neither sand nor Tar shall be hotter than two hundred and twenty-five (225) degrees Fahrenheit when being mixed together. If a thick, white smoke arises from the mixture, indicating it is overheated, five (5) gallons more Tar to each yard of sand shall be required. This mixture shall be spread evenly one and one-quarter (1¼) inches to one and one-half (1½) inches thick (so it will compact to one (1) inch) over the foundation, leveled with a straight-edge, and followed closely with dry, well-seasoned plank.

The plank shall be laid on this soft mixture, and bedded on it by hammering until the proper stability is obtained and the plank brought to a proper level and toe-nailed. If after hammering, any plank is below the proper level, the plank shall be taken up and more of the mixture spread on. (The plank and finished flooring shall be furnished and laid by other contractors.)



APPLICATION OVER CONCRETE

DAMPPROOF PLASTER BONDS FOR BASEMENTS.



***Note*—The materials and methods referred to here provide for remedial treatment of damp basements and for a plaster bonding agent where plaster finish is desired. Where water seepage is involved, indicating the presence of water under pressure, outside waterproofing treatment, as referred to on pages 48 and 49, is recommended.**

SPECIFICATION

Masonry—All holes and voids in the wall surfaces to be dampproofed shall be carefully filled with Portland Cement Mortar and all joints struck flush. The walls shall be thoroughly dry and free from oil, grease, excess cement mortar or other foreign matter that might interfere with the bonding and penetrating properties of the dampproof coating.

Application of Dampproofing—The interior surfaces of all exterior walls, including reveals of doors and windows, column coverings and pipe chases, shall be dampproofed with two thorough applications of Barrett Dampproof Coating and Plaster Bond (No. 10 Liquid, No. 20 Semi-Mastic) or one trowel coat of No. 30 Plastic.

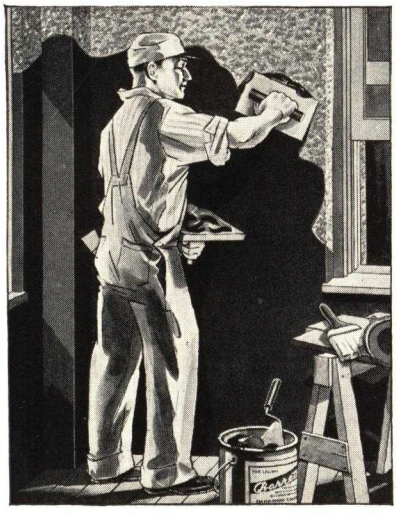
No. 10 Liquid shall be applied by brush or by compressed air spray. No. 20 Semi-Mastic shall be applied by heavy brush, mop or squeegee. No. 30 Plastic shall be applied by trowel to an average thickness of one-sixteenth ($\frac{1}{16}$) inch.

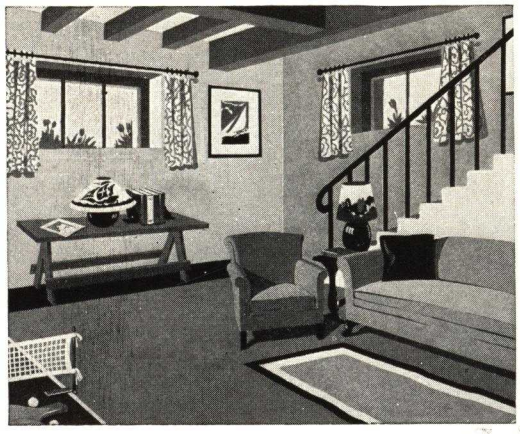
The coating shall be applied thoroughly and evenly until the surface presents a uniform black appearance, care being taken to completely coat all joints, crevices, cut-outs, wall chases and recesses, so as to form a continuous impervious film without holidays, pinholes or brown spots.

The dampproofing shall be applied before any pipes or metal work are installed and shall completely cover the inside surfaces of all walls, as above being carried out six (6) to eight (8) inches on rough floor slabs.

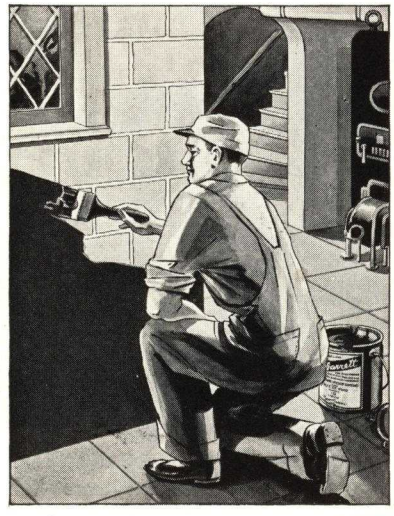
Plastering—The rough or scratch coat of wall plaster shall be applied directly to the dampproofing, but not less than twenty-four (24) hours nor more than seven (7) days after the latter has been applied.

***Note*—Do not use Barrett Dampproof Coatings on ceilings. Where these materials are to be used in conjunction with stucco or Portland Cement Mortar wall finishes, special application instructions shall be obtained either from the Architect or from THE BARRETT COMPANY.**



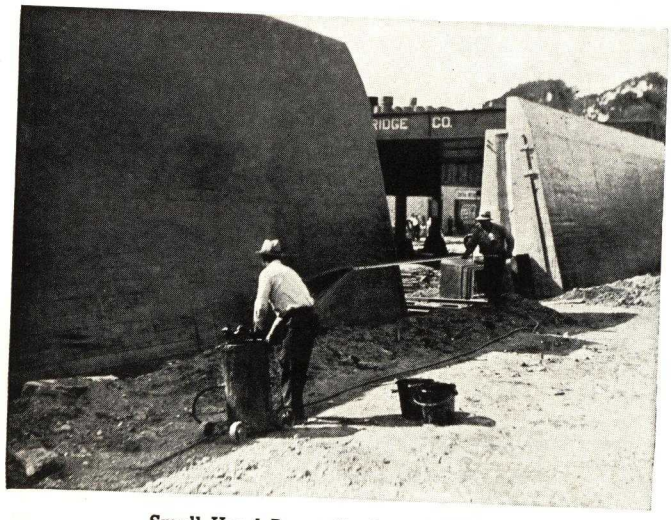


Above: **Finished Basement**

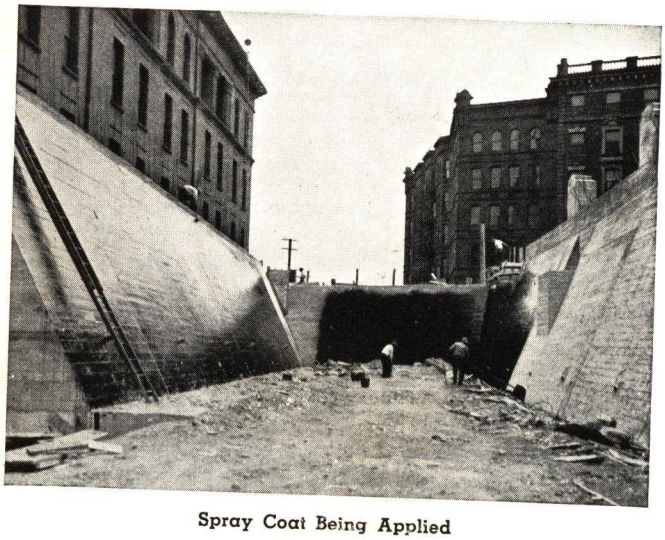


Left: **Plastic Method** *Right:* **Paint Method**

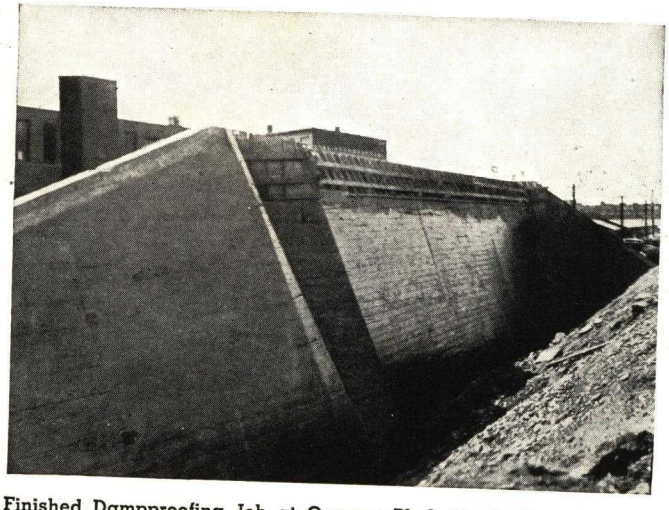
COAL TAR EMULSION
As Dampproofing and Curing Compound for Concrete



Small Hand Pump Used for Spraying



Spray Coat Being Applied



Finished Dampproofing Job at Oswego Blvd. Grade Crossing, New York Central Railroad, Syracuse, N. Y.

Greater Ultimate Strength for Masonry

A problem which confronts the builder of concrete construction is adequate curing. An agent is needed that will retard the evaporation of water and permit proper hydration of cement, thus providing conditions favorable to a minimum of shrinkage, internal stresses, surface cracking, crazing or disintegration of properly proportioned concrete.

COAL TAR EMULSION

Such an agent is Barrett Coal Tar Emulsion. Barrett Coal Tar Emulsion consists, essentially, of a soft coal tar pitch, minutely dispersed and suspended in water. The water content is used to reduce the pitch to a consistency suitable for application. After application, the water separates, leaving a uniform coating of pitch. This protective coating of **coal tar pitch** represents **plus** value and makes Barrett Coal Tar Emulsion unique among curing emulsions.

Coal tar pitch has proved itself to be one of nature's greatest waterproofing agents, and its scientific adaptation as an emulsion for curing of concrete masonry represents a genuine advancement in the field of heavy construction.

Barrett Coal Tar Emulsion, applied after the initial set, adheres firmly to damp concrete surfaces, in such a way as to seal all chinks and pores, thus preventing the concrete from drying too rapidly and promoting greater ultimate strength to the masonry mass.

Damp-proofing

In addition, Barrett Coal Tar Emulsion, after its function of curing is completed, serves as a damp-proof coating which resists the entrance of disintegrating agents. This dual function of Barrett Coal Tar Emulsion makes it exceptionally suited for use on retaining walls, highway bridges, abutments, grade crossing elimination projects, etc.

APPLICATION SPECIFICATIONS

Surfaces upon which the Coal Tar Emulsion is to be applied shall be free from dirt, dust or other loose particles. Oils or grease, when present, shall be removed by proper solvents and the surface washed with clean water. Old walls should be scrubbed with a wire brush and all scale, chinks, etc., removed. Existing cracks shall be properly repaired and the entire surface made smooth, before the Coal Tar Emulsion is applied.

First—A uniform coat of Coal Tar Emulsion shall be applied either by means of spray, hard bristle brush, or mop.

Second—Each coat shall be allowed to dry before application of the succeeding coat.

Third—The Coal Tar Emulsion shall be applied in not less than two (2) coats, the first coat to be applied at the rate of one and one-half (1½) to two (2) gallons per square, and the second coat at the rate of approximately two (2) gallons per square, so that a total of approximately four (4) gallons per square, for two (2) coats, shall be applied.

Notes—No. 1—When used on concrete, the Coal Tar Emulsion may be applied immediately after the forms have been removed and to a damp masonry surface.

No. 2—The Coal Tar Emulsion shall not be applied to frozen surfaces nor at temperatures below forty-five (45) deg. Fahrenheit and sufficient time should be allowed for the Emulsion to set before temperature drops below forty-five (45) deg. Fahrenheit.

No. 3—The Coal Tar Emulsion shall be used as received and shall be thoroughly stirred before being applied. If necessary to thin the Emulsion, this shall be done by the addition of water only.

Barrett SINCE 1854

THE BARRETT APPROVED ROOFER

When you study the outstanding acceptance and performance of Barrett Roofs you must ultimately come to the conclusion that Barrett's success has been based on a well-known axiom of the construction industry—that good roof service depends on the use of the proper materials . . . applied to a proved standard . . . by competent workmen.

The materials that go into Barrett Roofs are the finest that can be made, but this is to no avail if they are not properly applied.

Accordingly in its earliest days, Barrett formulated certain exacting standards for the application of its roofs. These standards are now known as the "Barrett Specification Roof."

The next step was to build a roofing organization that could be depended upon to apply Barrett materials honestly and with the greatest possible skill. The extent to which it succeeded in this undertaking is represented by the Barrett Approved Roofer Organization.

Barrett is justifiably proud of its Approved Roofers. The building industry knows no finer or more experienced group of men. They represent the utmost in ability and reliability. Their employment is recommended . . . on new work, repair or maintenance . . . for complete and satisfactory results.

THE Barrett Company manufactures, in addition to the Built-Up Roofing and Waterproofing Materials mentioned in this manual, an extensive line of prepared roofing products, such as mineral-surfaced asphalt shingles, roll roofings, sheathings, building papers, rock wool insulation, roof preservatives and repair materials, protective paints, wood preservatives, etc., constituting a comprehensive service for the building industry. Particulars concerning any materials in these classifications will be furnished upon request.

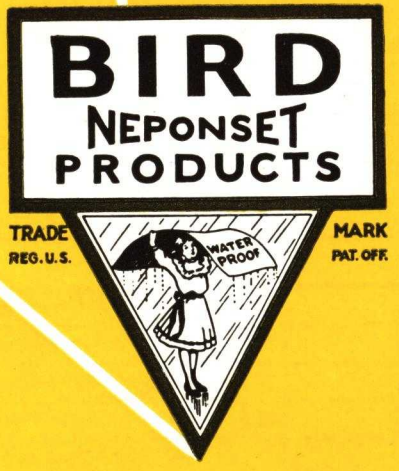
Barrett
SINCE
1854

Our cover illustration is downtown Philadelphia with the historic City Hall in left foreground. As in most large cities in the United States and Canada, Barrett roofed buildings are predominant in Philadelphia.

6
3

BIRD

BUILT-UP ROOFING



1939

Index to Specifications — Bird Built-up Roofs

GRAVEL OR SLAG SURFACE—FOR FLAT DECKS

TERMS OF BOND	SPECIFICATION NUMBER	TYPE	PAGE NUMBER	ROOF DECK CONSTRUCTION	LIMITATIONS OF ROOF DECK SLOPE	TYPE OF SURFACE	Underwriter's Classification	MAKE-UP OF ROOF	NO. OF MOPPINGS	WEIGHT OF MATERIALS POUNDS PER SQUARE: BASE SHEET	FELT	SHEATHING PAPER	ASPHALT OR PITCH	PRIMER	GRAVEL	SLAG	CAP SHEET	TOTAL WEIGHT PER SQUARE: WITH CAP SHEET	GRAVEL SURFACED	SLAG SURFACED
20	**101**	515 AW	6	Wood or Precast Gypsum	¼-3	Gravel or Slag	A	5-15 lb. Asphalt Felts	4		78		150		400	300			628	528
20	**102**	415 AC	7	Concrete	¼-2	Gravel or Slag	A	4-15 lb. Asphalt Felts	5		62		180	10	400	300			652	552
15	**103**	415 AW	8	Wood or Precast Gypsum	¼-3	Gravel or Slag	A	4-15 lb. Asphalt Felts	3		62		120		400	300			582	482
15	**104**	315 AC	9	Concrete	¼-2	Gravel or Slag	A	3-15 lb. Asphalt Felts	4		46		150	10	400	300			606	506
20	**601**	515 TW	6	Wood or Precast Gypsum	0-2	Gravel or Slag	A	Sheathing and 5-15 lb. Tarred Felts	4		78	6	150		400	300			634	534
20	**602**	415 TC	7	Concrete	0-2	Gravel or Slag	A	4-15 lb. Tarred Felts	5		62		180		400	300			642	542
15	**603**	415 TW	8	Wood or Precast Gypsum	0-2	Gravel or Slag	A	Sheathing and 4-15 lb. Tarred Felts	3		62	6	120		400	300			588	488
15	**604**	315 TC	9	Concrete	0-2	Gravel or Slag	A	3-15 lb. Tarred Felts	4		46		150		400	300			596	496

CRUSHED MINERAL SURFACE—FOR SLOPING AND STEEP DECKS

TERMS OF BOND	SPECIFICATION NUMBER	TYPE	PAGE NUMBER	ROOF DECK CONSTRUCTION	LIMITATIONS OF ROOF DECK SLOPE	TYPE OF SURFACE	Underwriter's Classification	MAKE-UP OF ROOF	NO. OF MOPPINGS	WEIGHT OF MATERIALS POUNDS PER SQUARE: BASE SHEET	FELT	SHEATHING PAPER	ASPHALT OR PITCH	PRIMER	GRAVEL	SLAG	CAP SHEET	TOTAL WEIGHT PER SQUARE: WITH CAP SHEET	GRAVEL SURFACED	SLAG SURFACED
20	**201**	B 215 ANW	10	Wood or Precast Gypsum	1-6	White Mineral Granules	C	55 lb. Base; 2-15 lb. Asphalt Felts; Neponset (Selvage) Cap Sheet	4	55	31		120					88	294	
20	**202**	B 215 ANC	11	Concrete	1-6	White Mineral Granules	C	45 lb. Base; 2-15 lb. Asphalt Felts; Neponset (Selvage) Cap Sheet	5	45	31		150	10				88	324	
15	**203**	B 15 ANW	12	Wood or Precast Gypsum	1-6	White Mineral Granules	C	55 lb. Base; 1-15 lb. Asphalt Felt; Neponset (Selvage) Cap Sheet	3	55	15		90					88	248	
15	**204**	B 15 ANC	13	Concrete	1-6	White Mineral Granules	C	45 lb. Base; 1-15 lb. Asphalt Felt; Neponset (Selvage) Cap Sheet	4	45	15		120	10				88	278	
10	**205**	215 ANW	14	Wood or Precast Gypsum	1-6	White Mineral Granules	C	2-15 lb. Asphalt Felts; Neponset (Selvage) Cap Sheet	3		31		90					88	209	
10	**206**	215 ANC	15	Concrete	1-6	White Mineral Granules	C	2-15 lb. Asphalt Felts; Neponset (Selvage) Cap Sheet	4		31		120	10				88	249	
10	**207**	BNW	16	Wood or Precast Gypsum	1-up	White Mineral Granules	C	55 lb. Base; Neponset (Selvage) Cap Sheet	2	55			60					88	203	
10	**208**	BNC	17	Concrete	1-up	White Mineral Granules	C	45 lb. Base; Neponset (Selvage) Cap Sheet	3	45			90	10				88	233	

ASBESTINE TALC SURFACE—FOR SLOPING AND STEEP DECKS

TERMS OF BOND	SPECIFICATION NUMBER	TYPE	PAGE NUMBER	ROOF DECK CONSTRUCTION	LIMITATIONS OF ROOF DECK SLOPE	TYPE OF SURFACE	Underwriter's Classification	MAKE-UP OF ROOF	NO. OF MOPPINGS	WEIGHT OF MATERIALS POUNDS PER SQUARE: BASE SHEET	FELT	SHEATHING PAPER	ASPHALT OR PITCH	PRIMER	GRAVEL	SLAG	CAP SHEET	TOTAL WEIGHT PER SQUARE: WITH CAP SHEET	GRAVEL SURFACED	SLAG SURFACED
10	**303**	215 APW	14	Wood or Precast Gypsum	1-6	Asbestine Talc	C	2-15 lb. Asphalt Felts; Paroid (Selvage) Cap Sheet	3		31		90					55	176	
10	**304**	215 APC	15	Concrete	1-6	Asbestine Talc	C	2-15 lb. Asphalt Felts; Paroid (Selvage) Cap Sheet	4		31		120	10				55	216	
10	**301**	BPW	16	Wood or Precast Gypsum	1-up	Asbestine Talc	C	55 lb. Base; Paroid (Selvage) Cap Sheet	2	55			60					55	170	
10	**302**	BPC	17	Concrete	1-up	Asbestine Talc	C	45 lb. Base; Paroid (Selvage) Cap Sheet	3	45			90	10				55	200	

ROOF INSULATION

			18	Wood or Precast Gypsum	Application of Roof Insulation for High and Low Humidity Conditions
			18	Concrete	Application of Roof Insulation for High and Low Humidity Conditions
			18	Steel	Application of Roof Insulation for High and Low Humidity Conditions

FLASHINGS

	1		20	Base: Felts & Mineral Surface Roofing	Cap: Three Course Plastic
	2		20	Base: Felts & Mineral Surface Roofing	Cap: Cover Inside Face and Top of Wall
	3		21	Base: Felts & Mineral Surface Roofing	Cap: Three Course Through Wall
	4		22	5 Course Plastic	
	5		19	Metal Base and Cap	
	6		19	Raggle Block Type	

NOTE: Specifications for Flashings and Edgings to meet special conditions will be furnished when requested.

Specifications covering application of roofs over insulation are combined with specifications for application over concrete.

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ROOFING MANUAL

ON BIRD BUILT-UP ROOFINGS AND FLASHINGS

Complete Specifications for **BIRD BUILT-UP**

. . . . . *Bonded Roofs for all types of service*

Bird Built-up Roofings for all purposes

There is a Bird Built-Up Roof for every type of flat roof construction. In the data and specifications given on the following pages you will find the answer to positive roof protection. The mineral surfacing protecting the waterproofing elements is one of the many specific features of Bird Built-Up Roofs that provide longer life.

Asphalt and Tar Roof Types

Bird Built-Up Roofing Specifications are designed to use either Bird Roofing Pitch or Bird Roofing Asphalt as desired by the Architect to meet particular conditions or preferences. Either pitch or asphalt may be used as the waterproofing element for flat roofs. For steep roofs, or those having a slope of over two inches to the foot, asphalt should be used on account of its high melting point and stability. Special high melting type asphalts are produced by Bird to be used on steep roofs. These are of the very highest quality and assure long life for the roof.

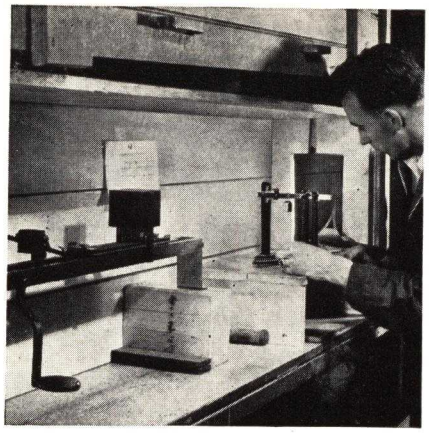
Bonded Roofs

The satisfaction that any roof will give depends upon two important factors: First, the materials must be suitable for the service to be rendered. Second, and equally important, these materials must be correctly applied. When both these conditions are met, satisfactory results are assured. Because Bird & Son, inc., has carefully covered these conditions, they are prepared to offer bonded roofs for ten, fifteen or twenty years' service.

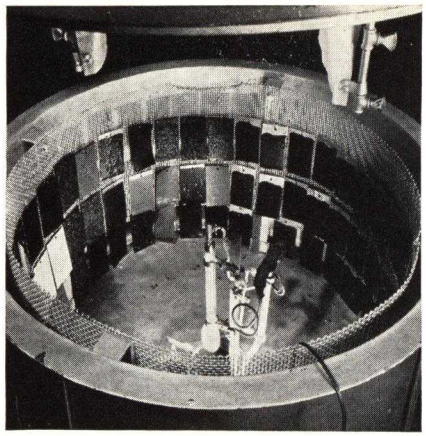
Bird Bonded Roofs

Installed only by accredited Roofers

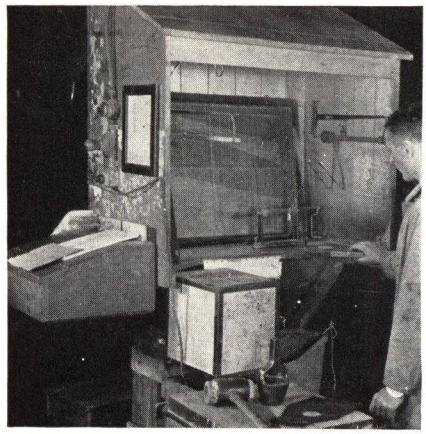
A properly applied roof is one in which all of the elements entering into its make-up are bonded together into one solid mass. This perfect application results only through experienced workmanship. Such workmanship is made possible on Bird Bonded Roofs because of the careful selection of only accredited roofers of unquestioned dependability applying Bird Roofs.



GRANULE EMBEDDING CONTROL



ACCELERATED WEATHERING TESTER



FELT SATURATION CONTROL

Along the Production Line—Scientific Control

Materials

Manufacturing Control

The quality of Bird Built-Up Roof Materials is under Bird control throughout every phase of manufacture.

Rag felt base for the production of cap sheets, base sheets and saturated felts is made by Bird to rigid specifications and will be found exceptionally uniform in strength and texture.

Asphalt for saturating and coating is refined by Bird to characteristics best suited for roofing use. Saturants and coatings refined from the same basic materials combine in a roof to the best advantage because they are compatible.

Surfacing granules are quarried and crushed by Bird. They are carefully graded as to size, thoroughly cleaned by an oil treating process and perfectly embedded to produce a more permanent and better weathering surface.

Cap Sheet Roofs

For more than a quarter of a century Bird has recommended Built-Up Roofs with mineral surfacings to protect the waterproofing elements from the sun and to provide a longer life. Though materials and methods constantly have been improved, it neither has been necessary nor advisable to make any change in the basic principles.

Neponset Cap Sheet

Designed as a weathering and wearing surface for Built-Up Roofs, this Surfaced Cap Sheet is made to lay up in two ply construction. Built 36 ins. wide, 17 ins. are coated with asphalt and surfaced with protecting mineral granules. Nineteen inches are left as bare saturated felt selvage. The asphalt coating is applied in the factory under ideal conditions and in a layer of uniform thickness.

Neponset Cap Sheet is furnished in rolls 71¼ ft. long, weighing 88 lbs. and containing enough material to cover 100 sq. ft. of surface when laid two ply. Standard surfacings are either Bird White Quartzite or Black Slate.

Paroid Cap Sheet

Similar in design and use to Neponset Cap Sheet and having the same bare felt selvage, Paroid Cap Sheet is surfaced with White Asbestine Talc. Paroid surfacing is lighter in weight and provides a smoother surface than Quartzite or Slate granules. Paroid Cap Sheet is furnished in rolls 71¼ ft. long, weighing 55 lbs. and containing enough material to cover 100 sq. ft. of surface when laid two ply.

Bird Base Sheets

Saturated and coated rag felts having both sides lightly sanded to provide surfaces to which saturated felts and cap sheets can be bonded with Roofing Asphalt. Bird Base Sheets are furnished in two weights, 45 lbs. and 55 lbs. per square and in rolls containing 108 sq. ft. of material.

Bird Asphalt Felt

Rag felt thoroughly saturated with pure, non-volatile asphalt. Bird asphalt felts are made in several weights, standard for Built-Up Roof work being 15 lbs. per 100 sq. ft. and 30 lbs. per 100 sq. ft. Both weights are made 36 ins. wide and are furnished in rolls containing 432 sq. ft. and 216 sq. ft., respectively.

Bird Tarred Felt

Rag felt thoroughly saturated with pure tar. Made 32 ins. wide, weighing 15 lbs. per 100 sq. ft. and is furnished in rolls containing 432 sq. ft.

Bird Roofing Asphalt

A special solid asphalt in two grades, No. 16 and No. 18, for flat and steep work, respectively. Furnished in drums weighing approximately 400 lbs. each.

Bird Roofing Pitch

A straight run coal tar pitch. Furnished in wood and metal barrels weighing from 350 lbs. to 500 lbs. each.

Bird Flashing Cement

An asphalt and asbestos cement of troweling consistency especially developed for the construction of plastic flashings.

Standard Specifications

All Bird Standard Built-Up Roof Materials carry Underwriters' labels. Bird Asphalt, Pitch, Asphalt Felt, Tarred Felt, Flashing Cement and Primer meet all standard Federal, State, City and A. S. T. M. specifications.

Design and Workmanship

Selecting the Proper Roof

Bird standard specifications include the following types as tabulated in the Index on page 2:

Group 1—Gravel or Slag Surfaced Asphalt Roofs.
Group 2—Gravel or Slag Surfaced Pitch Roofs.
Group 3—Neponset Cap Sheet Roofs.
Group 4—Paroid Cap Sheet Roofs.

Selection of the correct specifications to meet any given set of conditions is simplified by the use of the tabulation referred to. The following general recommendations can be made:

Dead Level Roofs.....Use Group 2
Slope ¼″ to 1″ per foot.....Use Group 1 or 2
Slope 1″ to 2″ per foot.....Use Group 1, 2, 3 or 4
Slope over 2″ per foot.....Use Group 3 or 4

Roof Traffic

Where roof traffic is to be encountered, the use of a roof from Group 3 or 4 will prove more satisfactory than a gravel or slag surfaced type.

Workmanship

The satisfaction that any roof will give depends upon the suitability and quality of the materials and upon the care with which these materials are combined.

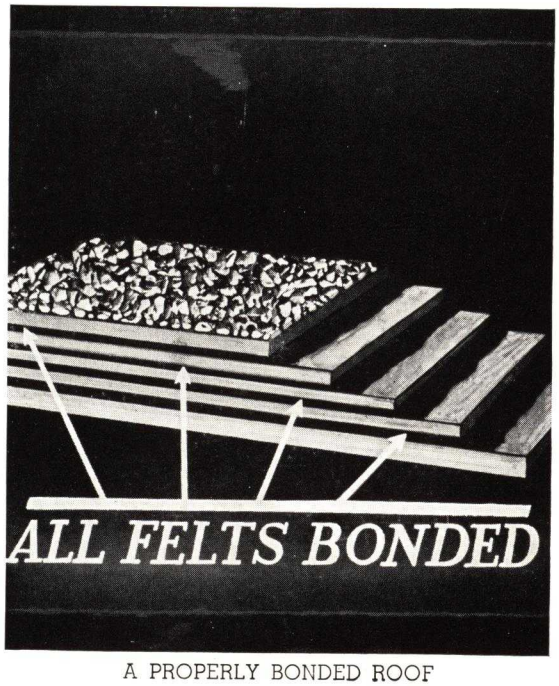
A properly applied roof is one in which all of the elements entering into its make-up are bonded together into one solid mass. In no case can such proper application result from inexperienced or careless workmanship.

The use of a heavy mopping of roofing asphalt and the thorough brooming of felts and cap sheets into this mopping to exclude all entrapped air are necessary for best results.

AN EFFICIENT MOP

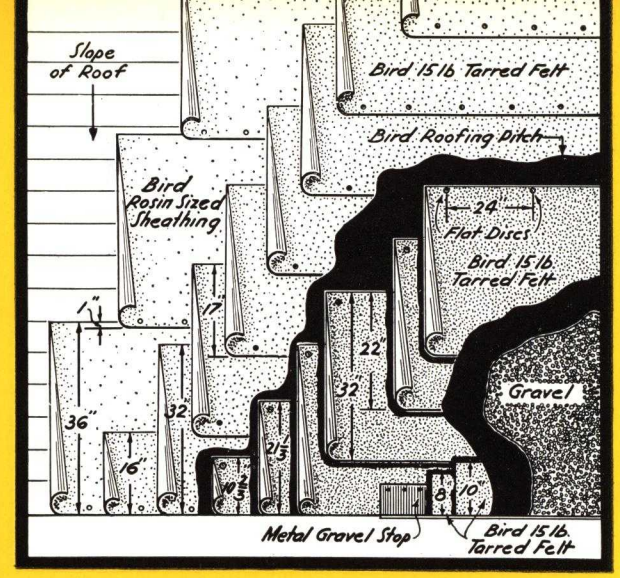
BROOMING THE FELT

ENOUGH BITUMEN TO FORM A FILLET



A PROPERLY BONDED ROOF

Steps in the Production of a Good Built-up Roof



BIRD 20 YEAR BUILT-UP ROOF, PITCH AND GRAVEL OR SLAG

Over Wood or Precast Gypsum Decks Slope 0" to 2" in 1'-0"

SPECIFICATION NO. 601—TYPE 515-TW

BILL OF MATERIALS PER 100 SQUARE FEET

Rosin Sized Paper—1 layer Bird Rosin Sized Paper	6 lbs.
Tarred Felt—5 layers Bird 15 lb. Tarred Felt	78 lbs.
Pitch—Bird Roofing Pitch	150 lbs.
Nails and Discs—1" barbed nails for wood or 1½" cut nails for gypsum, through flat tinned discs.	
Surfacing—Gravel	400 lbs.
Slag	300 lbs.

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 601—Type 515-TW, Built-up Roof and Bird Flashing (state type) to (State in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Rosin Sized Sheathing Paper—Shall be Bird Rosin Sized Sheathing Paper, thirty-six (36) ins. wide, weighing not less than six (6) lbs. per one hundred (100) sq. ft.

Felt—Shall be Bird 15 lb. Tarred Felt thirty-two (32) ins. wide weighing approximately 15 lbs. per one hundred (100) sq. ft.

Pitch—Shall be Bird Roofing Pitch and shall not be heated above three hundred seventy-five (375) degrees Fahrenheit.

Gravel or Slag—Shall be dry and free from dirt and range from one-quarter (¼) to five-eighths (⅝) in. in size.

Nails—For wood or wooden nailing strips, shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire roof deck shall be covered with one (1) layer of Sheathing Paper, lapping sheets not less than one (1) in.

(2) Two (2) plies of Bird 15 lb. Tarred Felt shall be laid dry over the Sheathing Paper, lapped seventeen (17) ins. and nailed often enough to hold sheets in place.

(3) Three (3) additional plies of Bird 15 lb. Tarred Felt shall be laid over entire surface, lapped twenty-two (22) ins. and each sheet shall be laid without wrinkles or buckles, and be embedded its full width in Bird Roofing Pitch. Each sheet shall be nailed along upper edge with barbed nails driven through flat tinned discs spaced not more than two (2) ft. on centers.

(4) A uniform coating of Bird Roofing Pitch shall be poured over the entire surface, using not less than sixty (60) lbs. per 100 sq. ft., into which, while hot, shall be embedded not less than four hundred (400) lbs. of gravel or three hundred (300) lbs. of slag per 100 sq. ft.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Twenty Year Guarantee Bond to cover the roofing applied under this contract.

BIRD 20 YEAR BUILT-UP ROOF, ASPHALT AND GRAVEL (SLAG)

Over Wood or Precast Gypsum Decks, Slope ¼" to 3" in 1'-0"

Bird Specification No. 101—Type 515-AW

The construction for this roof is identical with Specification No. 601, with changes under "Installation" as follows:

(1) Omit item No. 1 entirely.

(2) Two (2) plies of Bird 15 lb. Asphalt Felt 36 ins. wide shall be laid dry over entire roof deck, lapped nineteen (19) ins. and nailed in two (2) staggered parallel rows, three-quarters (¾) in. and eight and one-half (8½) ins. above the lower edge, and spaced nine (9) ins. center to center.

(3) Three (3) additional plies of Bird 15 lb. Asphalt Felt 36 ins. wide shall be laid over entire surface, lapped twenty-five (25) ins. and each sheet embedded its full width in Bird Roofing Asphalt No. 16.

(4) Substitute Bird Roofing Asphalt No. 16 for Bird Roofing Pitch.

(Balance of specification remains the same.)

BIRD 20 YEAR BUILT-UP ROOF, PITCH AND GRAVEL OR SLAG

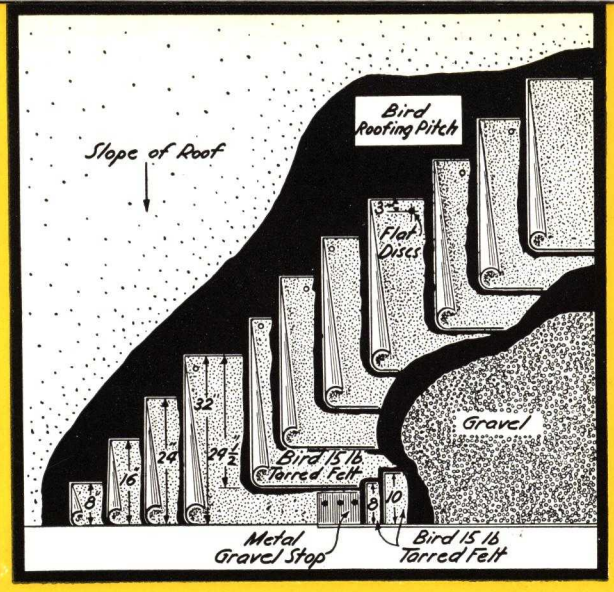
Over Poured Concrete or Gypsum Decks Slope 0" to 2" in 1'-0"

Over Insulation—Max. Slope 1" in 1'-0"

SPECIFICATION NO. 602—TYPE 415-TC

BILL OF MATERIALS PER 100 SQUARE FEET

Tarred Felt—4 layers Bird 15 lb. Tarred Felt	62 lbs.
Pitch—Bird Roofing Pitch	180 lbs.
Nails and Discs—1" barbed nails for wood nailing strips or 1½" cut nails for other materials, through flat tinned discs.	
Surfacing—Gravel	400 lbs.
Slag	300 lbs.



Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 602—Type 415-TC, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Felt—Shall be Bird 15 lb. Tarred Felt thirty-two (32) ins. wide weighing approximately 15 lbs. per one hundred (100) sq. ft.

Pitch—Shall be Bird Roofing Pitch and shall not be heated above three hundred seventy-five (375) degrees Fahrenheit.

Gravel or Slag—Shall be dry and free from dirt and range from one-quarter (¼) to five-eighths (⅝) in. in size.

Nails—For wood or wooden nailing strips, shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire roof deck shall be coated with Bird Roofing Pitch.

(2) Four (4) plies of Bird 15 lb. Tarred Felt shall be laid over entire roof surface, each sheet lapped twenty-four and one-half (24½) ins., shall be laid without wrinkles or buckles, and be embedded in Bird Roofing Pitch. Each sheet shall be nailed along upper edge with barbed nails driven through flat tinned discs spaced not more than two (2) ft. on centers.

(3) A uniform coating of Bird Roofing Pitch shall be poured over the entire surface, using not less than sixty (60) lbs. per 100 sq. ft., into which, while hot, shall be embedded not less than four hundred (400) lbs. of gravel or three hundred (300) lbs. of slag per 100 sq. ft.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Twenty Year Guarantee Bond to cover the roofing applied under this contract.

BIRD 20 YEAR BUILT-UP ROOF, ASPHALT AND GRAVEL (SLAG)

Over Concrete Decks, Slope ¼" to 2" in 1'-0"

Where slope is over 2", nailing strip shall be provided for in the roof deck

When Used Over Insulated Decks, No Primer Is Required

Bird Specification No. 102—Type 415-AC

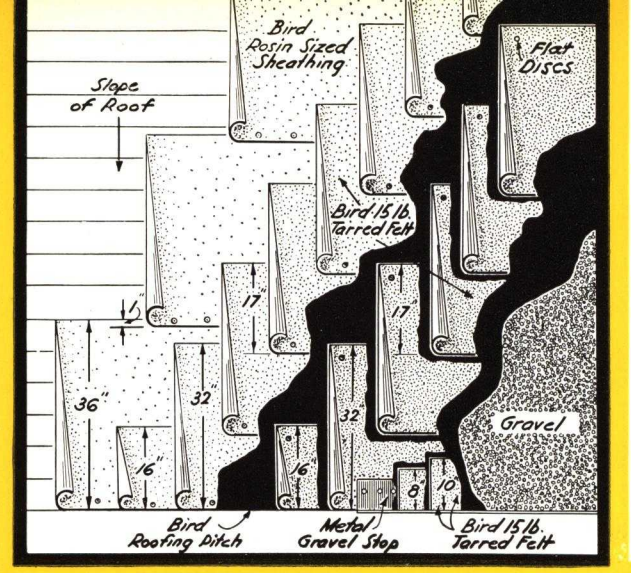
The construction for this roof is identical with Specification No. 602, with the following changes under "Installation":

(1) Entire roof surface shall first be primed with Bird Asphalt Primer.

(2) Four (4) plies of Bird 15 lb. Asphalt Felt 36 ins. wide shall be laid over entire roof surface, each sheet lapped twenty-seven and one-half (27½) ins. and embedded in Bird Roofing Asphalt. Each sheet shall be nailed three (3) ins. from upper edge with barbed nails driven through flat tinned discs spaced not more than twelve (12) ins. on centers.

(3) Substitute Bird Roofing Asphalt No. 16 for Bird Roofing Pitch.

(Balance of specification remains the same.)



BIRD 15 YEAR BUILT-UP ROOF, PITCH AND GRAVEL OR SLAG

Over Wood or Precast Gypsum Decks Slope 0" to 2" in 1'-0"

SPECIFICATION NO. 603—TYPE 415-TW

BILL OF MATERIALS PER 100 SQUARE FEET

Rosin Sized Paper—Bird Rosin Sized Paper	6 lbs.
Tarred Felt—4 layers Bird 15 lb. Tarred Felt	62 lbs.
Pitch—Bird Roofing Pitch	120 lbs.
Nails and Discs—1" barbed nails for wood or 1½" cut nails for gypsum, through flat tinned discs.	
Surfacing—Gravel	400 lbs.
Slag	300 lbs.

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 603—Type 415-TW, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Rosin Sized Sheathing Paper—Shall be Bird Rosin Sized Sheathing Paper, thirty-six (36) ins. wide, weighing not less than six (6) lbs. per one hundred (100) sq. ft.

Felt—Shall be Bird 15 lb. Tarred Felt thirty-two (32) ins. wide weighing approximately 15 lbs. per one hundred (100) sq. ft.

Pitch—Shall be Bird Roofing Pitch and shall not be heated above three hundred seventy-five (375) degrees Fahrenheit.

Gravel or Slag—Shall be dry and free from dirt and range from one-quarter (¼) to five-eighths (⅝) in. in size.

Nails—For wood or wooden nailing strips, shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire roof deck shall be covered with one (1) layer of Sheathing Paper, lapping sheets not less than one (1) in.

(2) Two (2) plies of Bird 15 lb. Tarred Felt shall be laid dry over the Sheathing Paper, lapped seventeen (17) ins. and nailed often enough to hold sheets in place.

(3) Two (2) additional plies of Bird 15 lb. Tarred Felt shall be laid over entire surface, lapped seventeen (17) ins. and each sheet shall be laid without wrinkles or buckles, and be embedded its full width in Bird Roofing Pitch. Each sheet shall be nailed along upper edge with barbed nails driven through flat tinned discs spaced not more than two (2) ft. on centers.

(4) A uniform coating of Bird Roofing Pitch shall be poured over the entire surface, using not less than sixty (60) lbs. per 100 sq. ft., into which, while hot, shall be embedded not less than four hundred (400) lbs. of gravel or three hundred (300) lbs. of slag per 100 sq. ft.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Fifteen Year Guarantee Bond to cover the roofing applied under this contract.

BIRD 15 YEAR BUILT-UP ROOF, ASPHALT AND GRAVEL (SLAG)

Over Wood or Precast Gypsum Decks, Slope ¼" to 3" in 1'-0"

Bird Specification No. 103—Type 415-AW

The construction for this roof is identical with Specification No. 603, with changes under "Installation" as follows:

(1) Omit item No. 1 entirely.

(2) Two (2) plies of Bird 15 lb. Asphalt Felt 36 ins. wide shall be laid dry over entire roof deck, lapped nineteen (19) ins. and nailed in two (2) staggered parallel rows, three-quarters (¾) in. and eight and one-half (8½) ins. above the lower edge, and spaced nine (9) ins. center to center.

(3) Two (2) additional plies of Bird 15 lb. Asphalt Felt 36 ins. wide shall be laid over entire surface, lapped nineteen (19) ins. and each sheet embedded its full width in Bird Roofing Asphalt No. 16.

(4) Substitute Bird Roofing Asphalt No. 16 for Bird Roofing Pitch.

(Balance of specification remains the same.)

BIRD 15 YEAR BUILT-UP ROOF, PITCH AND GRAVEL OR SLAG

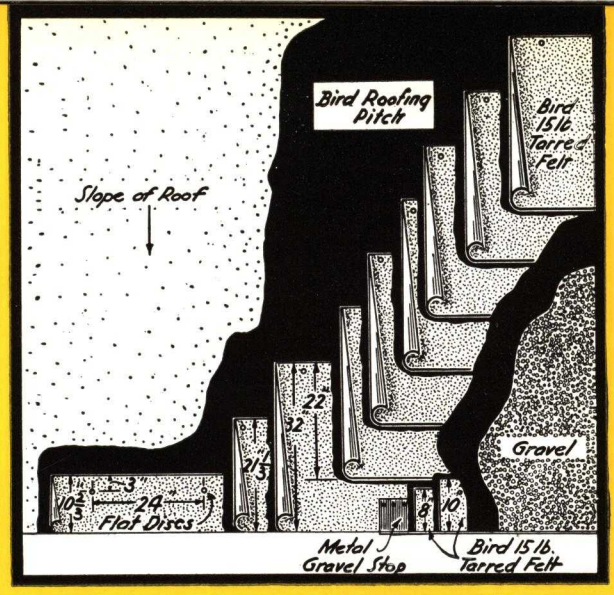
Over Poured Concrete or Gypsum Decks Slope 0" to 2" in 1'-0"

Over Insulation—Max. Slope 1" in 1'-0"

SPECIFICATION No. 604—TYPE 315-TC

BILL OF MATERIALS PER 100 SQUARE FEET

Tarred Felt—3 layers Bird 15 lb. Tarred Felt	46 lbs.
Pitch—Bird Roofing Pitch	150 lbs.
Nails and Discs—1" barbed nails for wood nailing strips or 1½" cut nails for other materials, through flat tinned discs.	
Surfacing—Gravel	400 lbs.
Slag	300 lbs.



Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 604—Type 315-TC, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Felt—Shall be Bird 15 lb. Tarred Felt thirty-two (32) ins. wide weighing approximately 15 lbs. per one hundred (100) sq. ft.

Pitch—Shall be Bird Roofing Pitch and shall not be heated above three hundred seventy-five (375) degrees Fahrenheit.

Gravel or Slag—Shall be dry and free from dirt and range from one-quarter (¼) to five-eighths (⅝) in. in size.

Nails—For wood or wooden nailing strips shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire roof deck shall be coated with Bird Roofing Pitch.

(2) Three (3) plies of Bird 15 lb. Tarred Felt shall be laid over entire roof surface, each sheet lapped twenty-two (22) ins., shall be laid without wrinkles or buckles, and be embedded in Bird Roofing Pitch. Each sheet shall be nailed along upper edge with barbed nails driven through flat tinned discs not more than two (2) ft. on centers.

(3) A uniform coating of Bird Roofing Pitch shall be poured over the entire surface, using not less than sixty (60) lbs. per 100 sq. ft. into which, while hot, shall be embedded not less than four hundred (400) lbs. of gravel or three hundred (300) lbs. of slag per 100 sq. ft.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Fifteen Year Guarantee Bond to cover the roofing applied under this contract.

BIRD 15 YEAR BUILT-UP ROOF, ASPHALT AND GRAVEL (SLAG)

Over Concrete Decks, Slope ¼" to 2" in 1'-0"

Where slope is over 2", nailing strip shall be provided for in the roof deck

When Used Over Insulated Decks, No Primer Is Required

Bird Specification No. 104—Type 315-AC

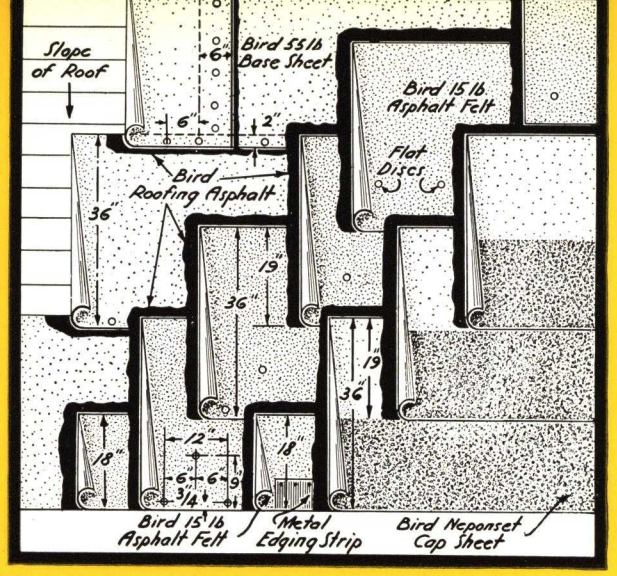
The construction for this roof is identical with Specification No. 604, with the following changes under "Installation":

(1) Entire roof surface shall first be primed with Bird Asphalt Primer:

(2) Three (3) plies of Bird 15 lb. Asphalt Felt 36 ins. wide shall be laid over entire roof surface, each sheet lapped twenty-five (25) ins. and embedded in Bird Roofing Asphalt. Each sheet shall be nailed three (3) ins. from upper edge with barbed nails driven through flat tinned discs spaced not more than twelve (12) ins. on centers.

(3) Substitute Bird Roofing Asphalt No. 16 for Bird Roofing Pitch.

(Balance of specification remains the same.)



BIRD 20 YEAR BUILT-UP ROOF, MINERAL SURFACE

Over Wood or Precast Gypsum Decks Slope 1" to 6" in 1'-0"

SPECIFICATION NO. 201—TYPE B215-A-NW

BILL OF MATERIALS PER 100 SQUARE FEET

Base Sheet—1 layer Bird 55 lb. Base Sheet	55 lbs.
Asphalt Felt—2 layers Bird 15 lb. Asphalt Felt	31 lbs.
Asphalt—Bird Roofing Asphalt	120 lbs.
Nails and Discs—1" barbed nails for wood or 1½" cut nails for gypsum, through flat tinned discs.	
Surfacing—2 layers Bird Neponset Cap Sheet	88 lbs.

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 201—Type B215-A-NW, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Base Sheet—Shall be Bird 55 lb. Base Sheet for Built-up Roofs, thirty-six (36) ins. wide weighing approximately fifty-five (55) lbs. per one hundred (100) sq. ft.

Felt—Shall be Bird 15 lb. Asphalt Felt thirty-six (36) ins. wide weighing approximately fifteen (15) lbs. per one hundred (100) sq. ft.

Cap Sheet—Shall be Bird Neponset Cap Sheet thirty-six (36) ins. wide with nineteen (19) in. selvage weighing approximately eighty-eight (88) lbs. per one hundred (100) sq. ft. in place.

Asphalt—Shall be Bird No. 18 Roofing Asphalt.

Nails—For wood or wooden nailing strips shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire roof deck shall be covered with one (1) layer of Bird 55 lb. Base Sheets lapped two (2) ins. at edges and six (6) ins. at ends. Laps shall be cemented with hot Bird Roofing Asphalt No. 18 and nailed on six (6) in. centers.

(2) Two (2) plies of Bird 15 lb. Asphalt Felt shall be laid over the Base Sheet, lapped nineteen (19) ins., and each sheet embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft. Each sheet shall be nailed in two (2) staggered parallel rows three-quarters (¾) in. and nine (9) ins. from lower edge of sheet, spacing nails twelve (12) ins. center to center.

(3) Bird Neponset Cap Sheet shall be laid in two ply construction over the Felts, lapped nineteen (19) ins. and embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft.

All Felts and Cap Sheets shall be laid without wrinkles or buckles, and shall be thoroughly broomed into the hot asphalt to secure proper bond at all points.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Twenty Year Guarantee Bond to cover the roofing applied under this contract.

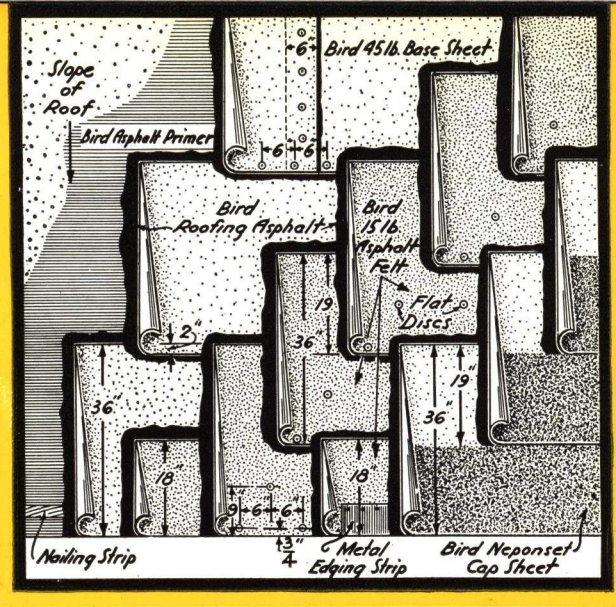
BIRD 20 YEAR BUILT-UP ROOF, MINERAL SURFACE

Over Poured Concrete, Poured Gypsum or Insulation Slope 1" to 6" in 1'-0"

SPECIFICATION NO. 202—TYPE B215-A-NC

BILL OF MATERIALS PER 100 SQUARE FEET

Primer—Bird Asphalt Primer	10 lbs.
Base Sheet—1 layer Bird 45 lb. Base Sheet	45 lbs.
Asphalt Felt—2 layers Bird 15 lb. Asphalt Felt	31 lbs.
Asphalt—Bird Roofing Asphalt	150 lbs.
Nails and Discs—1" barbed nails for wood nailing strips or 1½" cut nails for other materials, through flat tinned discs.	
Surfacing—2 layers Bird Neponset Cap Sheet	88 lbs.



When Used Over Insulated Decks, No Primer Is Required

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 202—Type B215-A-NC, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Primer—Shall be Bird Asphalt Primer.

Base Sheet—Shall be Bird 45 lb. Base Sheet for Built-up Roofs, thirty-six (36) ins. wide weighing approximately forty-five (45) lbs. per one hundred (100) sq. ft.

Felt—Shall be Bird 15 lb. Asphalt Felt thirty-six (36) ins. wide weighing approximately fifteen (15) lbs. per one hundred (100) sq. ft.

Cap Sheet—Shall be Bird Neponset Cap Sheet thirty-six (36) ins. wide with nineteen (19) in. selvage weighing approximately eighty-eight (88) lbs. per one hundred (100) sq. ft. in place.

Asphalt—Shall be Bird No. 18 Roofing Asphalt.

Nails—For wooden nailing strips, shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire surface to be roofed and flashed shall be coated with Bird Asphalt Primer and allowed to dry.

(2) Entire roof surface shall be covered with one (1) layer of Bird 45 lb. Base Sheet embedded full width in Bird Roofing Asphalt No. 18, and lapped two (2) ins. at edges and six (6) ins. at ends. Laps shall be cemented with hot Bird Roofing Asphalt No. 18 and nailed on six (6) in. centers.

(3) Two (2) plies of Bird 15 lb. Asphalt Felt shall be laid over the Base Sheet, lapped nineteen (19) ins. and each sheet embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft. Each sheet shall be nailed in two (2) staggered parallel rows three-quarters (¾) in. and nine (9) ins. from lower edge of sheet, spacing nails twelve (12) ins. center to center.

(4) Bird Neponset Cap Sheet shall be laid in two ply construction over the Felts, lapped nineteen (19) ins. and embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft.

All Felts and Cap Sheets shall be laid without wrinkles or buckles, and shall be thoroughly broomed into the hot asphalt to secure proper bond at all points.

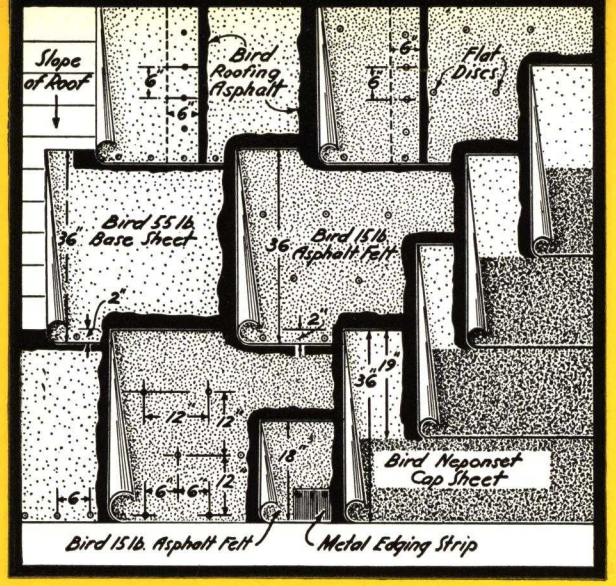
Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Twenty Year Guarantee Bond to cover the roofing applied under this contract.



BIRD 15 YEAR BUILT-UP ROOF, MINERAL SURFACE

Over Wood or Precast Gypsum Decks Slope 1" to 6" in 1'-0"

SPECIFICATION NO. 203—TYPE B15-A-NW

BILL OF MATERIALS PER 100 SQUARE FEET

Base Sheet—1 layer Bird 55 lb. Base Sheet	55 lbs.
Asphalt Felt—1 layer Bird 15 lb. Asphalt Felt	15 lbs.
Asphalt—Bird Roofing Asphalt	90 lbs.
Nails and Discs—1" barbed nails for wood or 1½" cut nails for gypsum, through flat tinned discs.	
Surfacing—2 layers Bird Neponset Cap Sheet	88 lbs.

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 203—Type B15-A-NW, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Base Sheet—Shall be Bird 55 lb. Base Sheet for Built-up Roofs, thirty-six (36) ins. wide weighing approximately fifty-five (55) lbs. per one hundred (100) sq. ft.

Felt—Shall be Bird 15 lb. Asphalt Felt thirty-six (36) ins. wide weighing approximately fifteen (15) lbs. per one hundred (100) sq. ft.

Cap Sheet—Shall be Bird Neponset Cap Sheet thirty-six (36) ins. wide with nineteen (19) in. selvage weighing approximately eighty-eight (88) lbs. per one hundred (100) sq. ft. in place.

Asphalt—Shall be Bird No. 18 Roofing Asphalt.

Nails—For wood or wooden nailing strips, shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails.) For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire roof deck shall be covered with one (1) layer of Bird 55 lb. Base Sheets lapped two (2) ins. at edges and six (6) ins. at ends. Laps shall be cemented with hot Bird Roofing Asphalt No. 18 and nailed on six (6) in. centers.

(2) One (1) ply of Bird 15 lb. Asphalt Felt shall be laid over the Base Sheet, lapped two (2) ins. at edges and six (6) ins. at ends, and each sheet embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft. Each sheet shall be nailed at the lap and in two (2) staggered parallel rows twelve (12) and twenty-four (24) ins. from lower edge of sheet, spacing nails twelve (12) ins. center to center.

(3) Bird Neponset Cap Sheet shall be laid in two ply construction over the Felt, lapped nineteen (19) ins. and embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft.

All Felts and Cap Sheets shall be laid without wrinkles or buckles, and shall be thoroughly broomed into the hot asphalt to secure proper bond at all points.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Fifteen Year Guarantee Bond to cover the roofing applied under their contract.

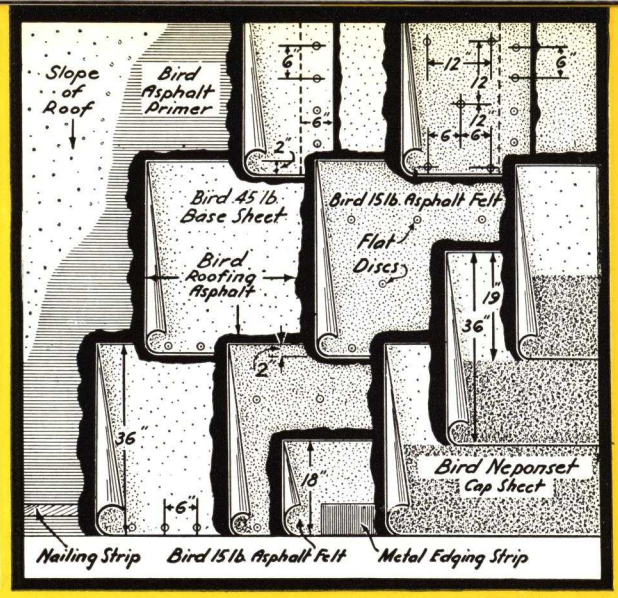
BIRD 15 YEAR BUILT-UP ROOF, MINERAL SURFACE

Over Poured Concrete, Poured Gypsum or Insulation Slope 1" to 6" in 1'-0"

SPECIFICATION NO. 204—TYPE B15-A-NC

BILL OF MATERIALS PER 100 SQUARE FEET

Primer—Bird Asphalt Primer	10 lbs.
Base Sheet—1 layer Bird 45 lb. Base Sheet	45 lbs.
Asphalt Felt—1 layer Bird 15 lb. Asphalt Felt	15 lbs.
Asphalt—Bird Roofing Asphalt	120 lbs.
Nails and Discs—1" barbed nails for wood nailing strips or 1½" cut nails for other materials, through flat tinned discs.	
Surfacing—2 layers Bird Neponset Cap Sheet	88 lbs.



When Used Over Insulated Decks, No Primer Is Required

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 204—Type B15-A-NC, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Primer—Shall be Bird Asphalt Primer.

Base Sheet—Shall be Bird 45 lb. Base Sheet for Built-up Roofs, thirty-six (36) ins. wide weighing approximately forty-five (45) lbs. per one hundred (100) sq. ft.

Felt—Shall be Bird 15 lb. Asphalt Felt thirty-six (36) ins. wide weighing approximately fifteen (15) lbs. per one hundred (100) sq. ft.

Cap Sheet—Shall be Bird Neponset Cap Sheet thirty-six (36) ins. wide with nineteen (19) in. selvage weighing approximately eighty-eight (88) lbs. per one hundred (100) sq. ft. in place.

Asphalt—Shall be Bird No. 18 Roofing Asphalt.

Nails—For wood or wooden nailing strips, shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire surface to be roofed and flashed shall be coated with Bird Asphalt Primer and allowed to dry.

(2) Entire roof surface shall be covered with one (1) layer of Bird 45 lb. Base Sheet embedded full width in Bird Roofing Asphalt No. 18, and lapped two (2) ins. at edges and six (6) ins. at ends. Laps shall be cemented with hot Bird Roofing Asphalt No. 18 and nailed on six (6) in. centers.

(3) One (1) ply of Bird 15 lb. Asphalt Felt shall be laid over the Base Sheet, lapped two (2) ins. at edges and six (6) ins. at ends, and each sheet embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft. Each sheet shall be nailed at the lap, and in two (2) staggered parallel rows twelve (12) ins. and twenty-four (24) ins. from lower edge of sheet, spacing nails twelve (12) ins. center to center.

(4) Bird Neponset Cap Sheet shall be laid in two ply construction over the Felt, lapped nineteen (19) ins. and embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft.

All Felts and Cap Sheets shall be laid without wrinkles or buckles, and shall be thoroughly broomed into the hot asphalt to secure proper bond at all points.

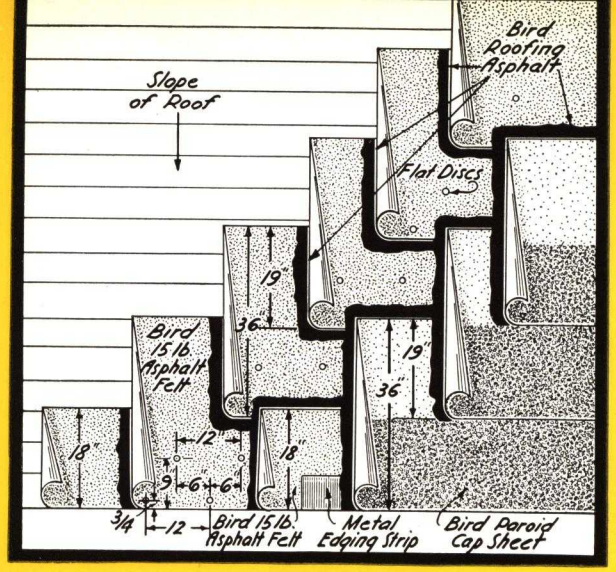
Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Fifteen Year Guarantee Bond to cover the roofing applied under this contract.



BIRD 10 YEAR BUILT-UP ROOF, ASBESTINE TALC SURFACE

Over Wood or Precast Gypsum Decks Slope 1" to 6" in 1'-0"

SPECIFICATION NO. 303—TYPE 215-A-PW

BILL OF MATERIALS PER 100 SQUARE FEET

Asphalt Felt—2 layers Bird 15 lb. Asphalt Felt ..... 31 lbs.
Asphalt—Bird Roofing Asphalt ..... 90 lbs.
Nails and Discs—1" barbed nails for wood or 1½" cut nails for gypsum, through flat tinned discs.
Surfacing—2 layers Bird Paroid Cap Sheet ..... 55 lbs.

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 303—Type 215-A-PW, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Felt—Shall be Bird 15 lb. Asphalt Felt thirty-six (36) ins. wide weighing approximately fifteen (15) lbs. per one hundred (100) sq. ft.

Cap Sheet—Shall be Bird Paroid Cap Sheet thirty-six (36) ins. wide with nineteen (19) in. selvage weighing approximately fifty-five (55) lbs. per one hundred (100) sq. ft. in place.

Asphalt—Shall be Bird No. 18 Roofing Asphalt.

Nails—For wood or wooden nailing strips shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire roof deck shall be covered with two (2) plies of Bird 15 lb. Asphalt Felt, lapped nineteen (19) ins., and the nineteen (19) in. lap embedded in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft. Each sheet shall be nailed in two (2) staggered parallel rows three-quarters (¾) in. and nine (9) ins. from lower edge of the sheet, spacing the nails twelve (12) ins. center to center.

(2) Bird Paroid Cap Sheet shall be laid in two ply construction over the Felt, lapped nineteen (19) ins. and embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft.

All Felts and Cap Sheets shall be laid without wrinkles or buckles, and shall be thoroughly broomed into the hot asphalt to secure proper bond at all points.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Ten Year Guarantee Bond to cover the roofing applied under this contract.

BIRD 10 YEAR BUILT-UP ROOF, MINERAL SURFACE

Over Wood or Precast Gypsum Decks, Slope 1" to 6" in 1'-0"

Bird Specification No. 205—Type 215-A-NW

The construction of this roof is identical with Specification No. 303, with the following substitution: *Throughout*, substitute Neponset Cap Sheet (weight, 88 lbs. per square) for Paroid Cap Sheet (weight, 55 lbs. per square).

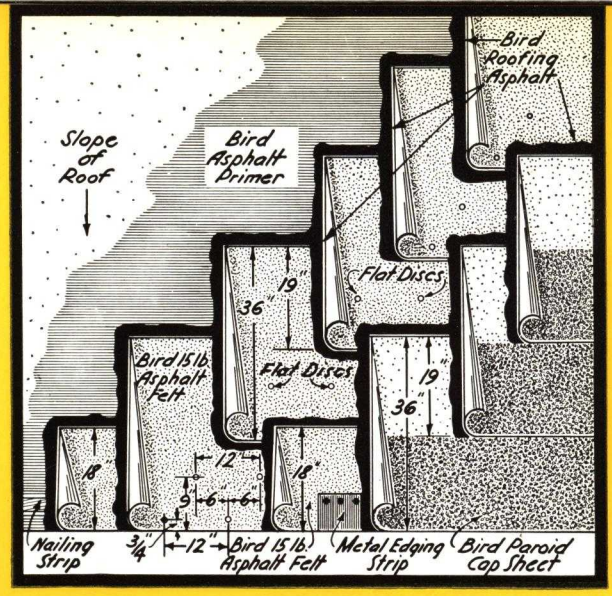
BIRD 10 YEAR BUILT-UP ROOF, ASBESTINE TALC SURFACE

Over Poured Concrete, Poured Gypsum or Insulation Slope 1" to 6" in 1'-0"

SPECIFICATION NO. 304—TYPE 215-A-PC

BILL OF MATERIALS PER 100 SQUARE FEET

Primer—Bird Asphalt Primer	10 lbs.
Asphalt Felt—2 layers Bird 15 lb. Asphalt Felt	31 lbs.
Asphalt—Bird Roofing Asphalt	120 lbs.
Nails and Discs—1" barbed nails for wood nailing strips or 1½" cut nails for other materials, through flat tinned discs.	
Surfacing—2 layers Bird Paroid Cap Sheet	55 lbs.



When Used Over Insulated Decks, No Primer Is Required

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 304—Type 215-A-PC, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Primer—Shall be Bird Asphalt Primer.

Felt—Shall be Bird 15 lb. Asphalt Felt thirty-six (36) ins. wide weighing approximately fifteen (15) lbs. per one hundred (100) sq. ft.

Cap Sheet—Shall be Bird Paroid Cap Sheet thirty-six (36) ins. wide with nineteen (19) in. selvage weighing approximately fifty-five (55) lbs. per one hundred (100) sq. ft. in place.

Asphalt—Shall be Bird No. 18 Roofing Asphalt.

Nails—For wood or wooden nailing strips shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire surface to be roofed and flashed shall be coated with Bird Asphalt Primer and allowed to dry.

(2) Entire roof deck shall be covered with two (2) plies of Bird 15 lb. Asphalt Felt, lapped nineteen (19) ins., and each sheet embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft. Each sheet shall be nailed in two (2) staggered parallel rows three-quarters (¾) in. and nine (9) ins. from lower edge of the sheet, spacing the nails twelve (12) ins. center to center.

(3) Bird Paroid Cap Sheet shall be laid in two ply construction over the Felt, lapped nineteen (19) ins. and embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft.

All Felts and Cap Sheets shall be laid without wrinkles or buckles, and shall be thoroughly broomed into the hot asphalt to secure proper bond at all points.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

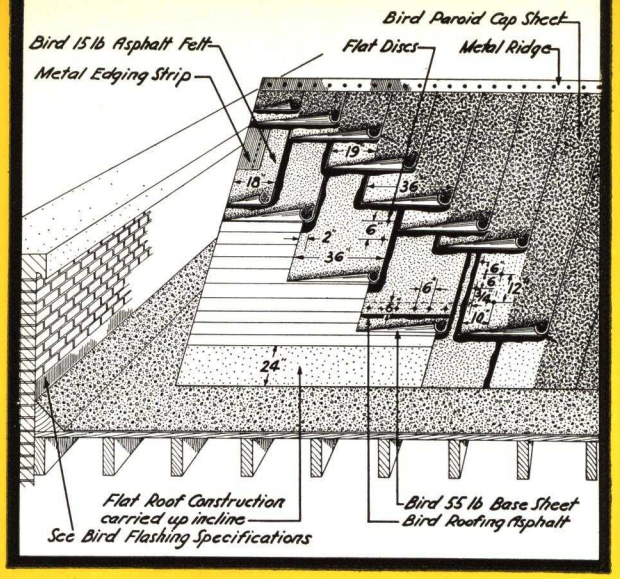
The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Ten Year Guarantee Bond to cover the roofing applied under this contract.

BIRD 10 YEAR BUILT-UP ROOF, MINERAL SURFACE

Over Poured Concrete, Poured Gypsum or Insulation, Slope 1" to 6" in 1'-0"

Bird Specification No. 206—Type 215-A-NC

The construction of this roof is identical with Specification No. 304, with the following substitution: *Throughout*, substitute Neponset Cap Sheet (weight, 88 lbs. per square) for Paroid Cap Sheet (weight, 55 lbs. per square).



BIRD 10 YEAR BUILT-UP ROOF, ASBESTINE TALC SURFACE

Over Wood or Precast Gypsum Decks Slope 1" up in 1'-0"

SPECIFICATION NO. 301—TYPE B-PW

BILL OF MATERIALS PER 100 SQUARE FEET

Base Sheet—1 layer Bird 55 lb. Base Sheet	55 lbs.
Asphalt—Bird Roofing Asphalt	60 lbs.
Nails and Discs—1" barbed nails for wood or 1½" cut nails for gypsum, through flat tinned discs.	
Surfacing—2 layers Bird Paroid Cap Sheet	55 lbs.

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 301—Type B-PW, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Base Sheet—Shall be Bird 55 lb. Base Sheet for Built-up Roofs, thirty-six (36) ins. wide weighing approximately fifty-five (55) lbs. per one hundred (100) sq. ft.

Cap Sheet—Shall be Bird Paroid Cap Sheet thirty-six (36) ins. wide with nineteen (19) in. selvage weighing approximately fifty-five (55) lbs. per one hundred (100) sq. ft. in place.

Asphalt—Shall be Bird No. 18 Roofing Asphalt.

Nails—For wood or wooden nailing strips shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire surface shall be covered with one (1) layer of Bird 55 lb. Base Sheet lapped two (2) ins. at edges and six (6) ins. at ends. Laps shall be cemented with hot Bird Roofing Asphalt No. 18 and nailed on six (6) in. centers.

(2) Bird Paroid Cap Sheet shall be laid in two ply construction over the Base Sheet, lapped nineteen (19) ins. and embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft. The felt, or selvage portion of the Cap Sheet, shall be nailed in two (2) staggered parallel rows three-quarters (¾) in. and ten (10) ins. from edge, spacing nails twelve (12) ins. center to center.

Note: On inclines under three (3) ins. per foot, Base Sheet and Cap Sheet shall be laid perpendicular to the pitch. On inclines over three (3) ins. per foot, Base Sheet and Cap Sheet shall be laid parallel with the pitch.

All Base Sheets and Cap Sheets shall be laid without wrinkles or buckles, and shall be thoroughly broomed into the hot asphalt to secure proper bond at all points.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Ten Year Guarantee Bond to cover the roofing applied under this contract.

BIRD 10 YEAR BUILT-UP ROOF, MINERAL SURFACE

Over Wood or Precast Gypsum Decks, Slope 1" up in 1'-0"

Bird Specification No. 207—Type B-NW

The construction of this roof is identical with Specification No. 301, with the following substitution: *Throughout,* substitute Neponset Cap Sheet (weight, 88 lbs. per square) for Paroid Cap Sheet (weight, 55 lbs. per square).

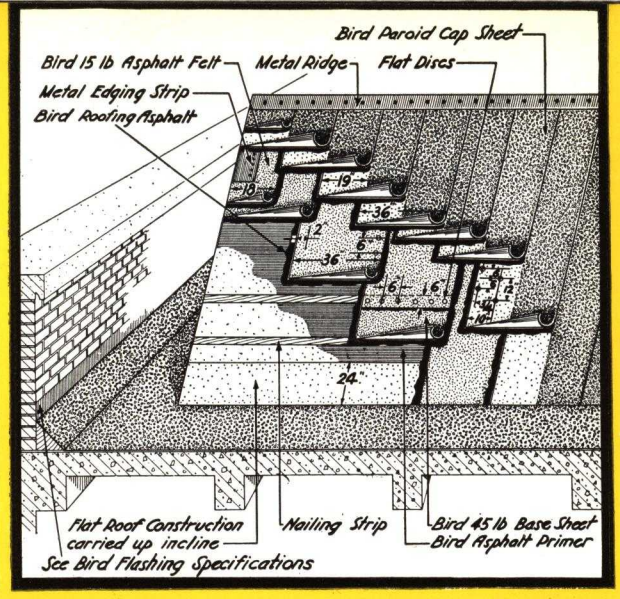
BIRD 10 YEAR BUILT-UP ROOF, ASBESTINE TALC SURFACE

Over Poured Concrete, Poured Gypsum or Insulation Slope 1" up in 1'-0"

SPECIFICATION NO. 302—TYPE B-PC

BILL OF MATERIALS PER 100 SQUARE FEET

Primer—Bird Asphalt Primer	10 lbs.
Base Sheet—1 layer Bird 45 lb. Base Sheet	45 lbs.
Asphalt—Bird Roofing Asphalt	90 lbs.
Nails and Discs—1" barbed nails for wood nailing strips or 1½" cut nails for other materials, through flat tinned discs.	
Surfacing—2 layers Bird Paroid Cap Sheet	55 lbs.



When Used Over Insulated Decks, No Primer Is Required

Work Included

The work proposed under this specification shall include all labor, material, equipment and services necessary for, and relevant to, the installation of Bird Specification No. 302—Type B-PC, Built-up Roof and Bird Flashing (state type) to (state in detail the surfaces to be covered).

Preliminary Work by Others

The preparation of the roof deck, adjoining vertical surfaces and metal construction (unless specified in Work Included) is *not* a part of the Roofing Contract but will be installed and furnished by others and shall include the following work:

(a) Roof Construction—Including cants, coves or fillets, shall be properly graded to conduct all water into gutters and roof drains, leaving all surfaces smooth and clean, in a satisfactory condition to receive roofing.

(b) Vertical Wall Construction—Including parapet walls, curbs, etc. Non-combustible walls (brick excepted) which are to receive Bird Flashing shall be provided with a nailing strip centered five (5) ins. above roof. Curbs of similar construction shall be provided with a nailing strip at top. (Where Bird Flashings are to extend through walls or under coping, walls will be built to proper height and left ready to receive flashing.)

(c) Metal Construction—Including roof drains, sheet metal flanges required at pipes, vents, conductor heads or other openings through roof, etc.

Inspection of Preliminary Work

The Roofing Contractor shall examine all surfaces on which or against which his work is to be applied and shall notify the Architect or General Contractor if for any reason there are defects which he considers detrimental to the installation of his materials. He shall see to it that all defects are corrected, all surfaces properly sloped to drains, etc., and all roof surfaces clean and dry before installing his materials. Application of roofing by Roofing Contractor shall be an acceptance of surfaces.

Materials

All Roofing Materials shall be as manufactured by Bird & Son, inc., and delivered to the job in the original packages, bearing the manufacturer's labels.

Primer—Shall be Bird Asphalt Primer.

Base Sheet—Shall be Bird 45 lb. Base Sheet for Built-up Roofs, thirty-six (36) ins. wide weighing approximately forty-five (45) lbs. per one hundred (100) sq. ft.

Cap Sheet—Shall be Bird Paroid Cap Sheet thirty-six (36) ins. wide with nineteen (19) in. selvage weighing approximately fifty-five (55) lbs. per one hundred (100) sq. ft. in place.

Asphalt—Shall be Bird No. 18 Roofing Asphalt.

Nails—For wood or wooden nailing strips shall be one (1) in. barbed nails driven through flat metal discs (or approved large head roofing nails). For gypsum or other composition decks, shall be one and one-half (1½) in. cut nails driven through flat metal discs.

Installation

(1) Entire surface to be roofed and flashed shall be coated with Bird Asphalt Primer and allowed to dry.

(2) Entire roof surface shall be covered with one (1) layer of Bird 45 lb. Base Sheet embedded full width in Bird Roofing Asphalt No. 18 and lapped two (2) in. at edges and six (6) ins. at ends. Laps shall be cemented with hot Bird Roofing Asphalt No. 18, and nailed on six (6) in. centers.

(3) Bird Paroid Cap Sheet shall be laid in two ply construction over the Base Sheet, lapped nineteen (19) ins. and embedded its full width in Bird Roofing Asphalt No. 18 applied at the rate of thirty (30) lbs. of Roofing Asphalt per mopping per one hundred (100) sq. ft. The felt, or selvage portion of the Cap Sheet, shall be nailed in two (2) staggered parallel rows three-quarters (¾) in. and ten (10) ins. from edge, spacing nails twelve (12) ins. center to center.

Note: On inclines under three (3) ins. per foot, Base Sheet and Cap Sheet shall be laid perpendicular to the pitch. On inclines over three (3) ins. per foot, Base Sheet and Cap Sheet shall be laid parallel with the pitch.

All Base Sheets and Cap Sheets shall be laid without wrinkles or buckles, and shall be thoroughly broomed into the hot asphalt to secure proper bond at all points.

Flashing

(Copy from Bird Flashing Specifications.)

Bond

If desired, where Bird & Son, inc., inspection is available, the following may be added for roofs of fifty or more squares:

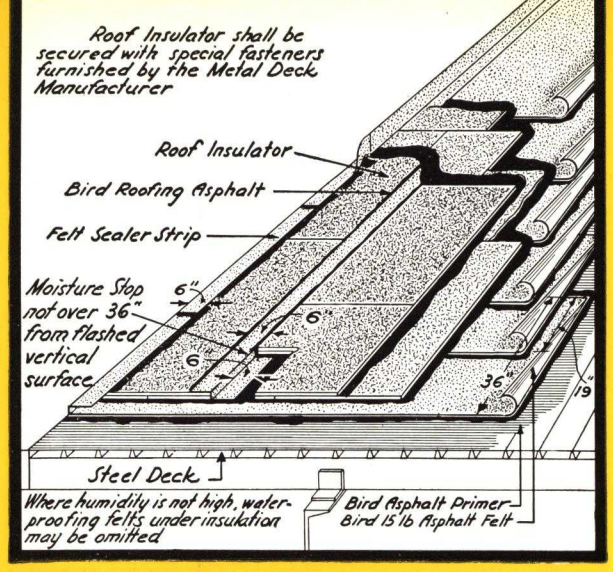
The Roofing Contractor shall be approved by Bird & Son, inc., and shall furnish a Bird Ten Year Guarantee Bond to cover the roofing applied under this contract.

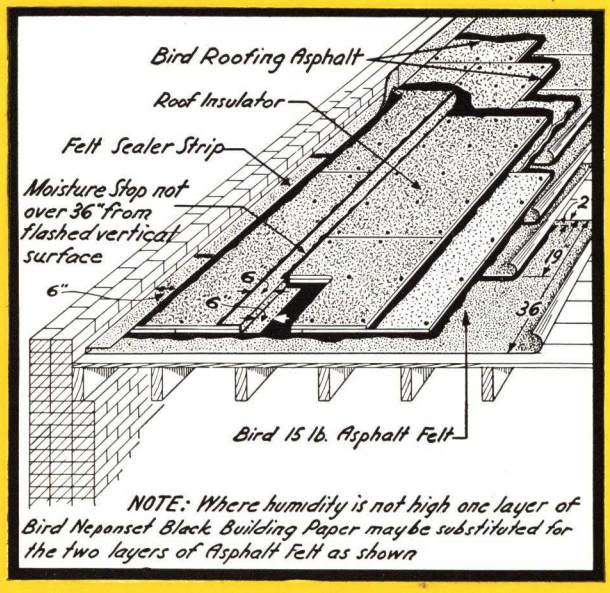
BIRD 10 YEAR BUILT-UP ROOF, MINERAL SURFACE

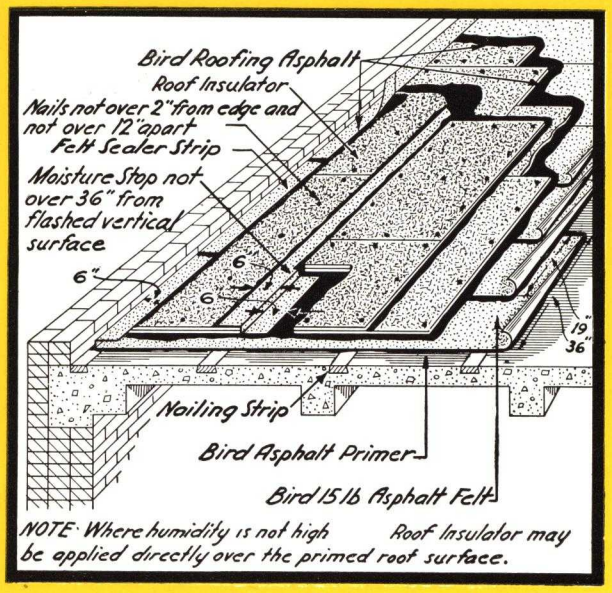
Over Poured Concrete, Poured Gypsum or Insulation, Slope 1" up in 1'-0"

Bird Specification No. 208—Type B-NC

The construction of this roof is identical with Specification No. 302, with the following substitution: *Throughout,* substitute Neponset Cap Sheet (weight, 88 lbs. per square) for Paroid Cap Sheet (weight, 55 lbs. per square).







ROOF INSULATION

INSTALLATION FOR HIGH HUMIDITY CONDITIONS

(1) Preparation of Roof Deck to Receive Insulation—

Concrete decks, and steel decks not finished with a shop coat of paint, shall be primed with one (1) coat of Bird Asphalt Primer and dried prior to application of roof insulation.

(2) Application of One or More Layers of Asphalt Felt—

Primed roof deck shall be covered with two (2) layers of Bird 15 lb. Asphalt Felt, lapped nineteen (19) ins. and thoroughly embedded in hot Bird Roofing Asphalt.

These waterproof sheets shall extend up six (6) ins. plus thickness of Roof Insulation on all walls and vertical surfaces and shall finally be turned over on, and solidly mopped to, top surface of Roof Insulation when laid.

Note: When applied over wood deck the laps only shall be sealed with Bird Roofing Asphalt, keeping the mopping back two (2) ins. from the edge of the underlying sheet and spot nailing sufficiently to hold them in place.

(3) Application of One or More Layers of Insulation—

The first layer of Roof Insulation shall be applied directly over this protected roof deck, embedding the sheet in a hot mopping of Bird Roofing Asphalt applied at the rate of thirty (30) lbs. per mopping per one hundred (100) sq. ft., breaking joints both between sheets of the same layer and sheets in successive layers. Except in the case of metal decks, the final layer of Roof Insulation shall be nailed through to roof deck, using approved large head galvanized Roofing Nails sufficiently long to penetrate at least three-quarters (¾) in. into the deck or into nailing strips provided therein. Nails shall be placed along all edges and at intermediate points, spaced twelve (12) ins. on centers and not more than two (2) ins. from edge of sheet (where character of deck permits). Roof insulation over metal decks shall be secured with special fasteners furnished by the Metal Deck Manufacturer.

(4) Moisture Stop —

(4a) Roof area shall be divided up into sections not more than twenty-four (24) ft. square by means of twelve (12) in. strips of Bird 15 lb. Asphalt Felt cemented to roof deck below, carried up and over Insulation and cemented to top ply of Roof Insulation. These Moisture Stops shall begin not further than thirty-six (36) ins. from all vertical flashed surfaces and shall be carried out in such a manner that moisture seepage in from a flashed surface will be checked by Moisture Stop before it has traversed more than thirty-six (36) ins. from vertical surface.

(4b) All exposed edges of Insulation at eaves, gable ends, etc., shall be sealed by mopping one (1) ply of Bird 15 lb. Asphalt Felt up and over the exposed edge and to top of the final layer of Roof Insulation.

INSTALLATION FOR LOW HUMIDITY CONDITIONS

Where humidity is not high, waterproofing felts may be omitted on concrete or steel decks, and one layer of Bird Neponset Black Building Paper may be substituted for waterproofing felts on wood decks.

BIRD FLASHINGS WITH BIRD BUILT-UP ROOFS

Where Sheet Metal Base and Cap Flashing Are Specified

SPECIFICATION NO. 5

Preliminary

All Felts, Base Sheets and Cap Sheets shall be cut off at the wall line without turning up.

Flashing shall be installed before the application of gravel, slag or tile to the roof surface.

Preparation of Surfaces to Be Flashed

All metal to which Asphalt is to be applied shall be coated with Bird Asphalt Primer and allowed to dry.

All masonry surfaces to be flashed shall be coated with Bird Asphalt Primer and allowed to dry.

Application of Base Flashing

(1) Case I—Where roofing is composed of a heavy Base Sheet or a Base Course of 15 lb. Asphalt Felts, the Base Flashing shall be installed directly over the Base Felts and under the Finishing Felts or Cap Sheets.

(1a) Two (2) layers of Bird 15 lb. Asphalt Felt extending six (6) ins. up on vertical wall and ten (10) ins. out on roof, shall be applied, embedding each in a hot mopping of Bird Roofing Asphalt.

(1b) Sheet Metal Base Flashing shall extend not less than six (6) ins. up on vertical wall and not less than six (6) ins. out on roof over the base felts. The angle formed in the flashing shall not be sharply bent but shall be rounded and the flashing shall be nailed along its edge into deck or wood nailing strips provided therein.

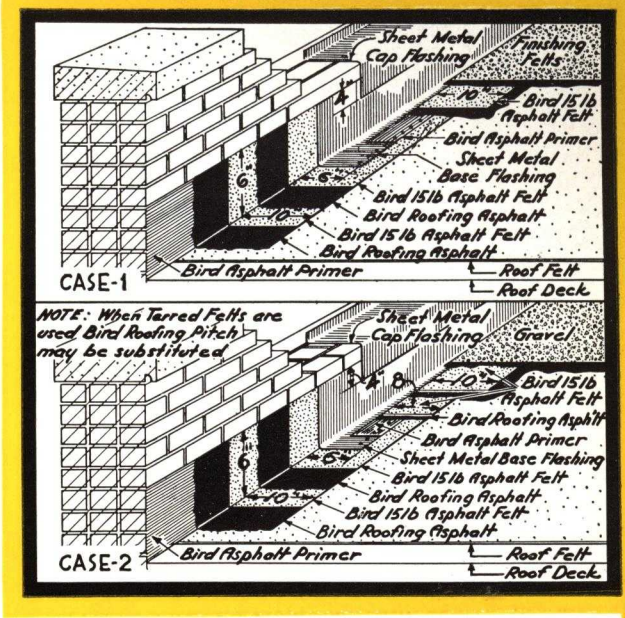
(1c) Where asphalt is used, metal flashing on the deck shall be primed with Bird Asphalt Primer and allowed to dry.

(1d) A ten (10) in. strip of Bird 15 lb. Asphalt Felt shall be embedded in a hot mopping of Bird Roofing Asphalt over the metal flashing extending on the roof. Finishing Felts as called for in Roofing Specification shall then be applied over the above Felt Strip.

(2) Case II—Where Roofing Felts are laid in shingle construction, Base Flashing shall be installed after all Roofing Felts have been laid and before application of Asphalt or Pitch, gravel or slag surfacing.

Note: In roofs employing Pitch, either Bird Roofing Asphalt or Bird Roofing Pitch may be used in the construction of flashings where Asphalt Mopping is specified.

(2a) Two (2) layers of Bird 15 lb. Asphalt Felt extending six (6) ins. up on vertical wall and ten (10) ins. out on roof, shall be applied, embedding each in a hot mopping of Bird Roofing Asphalt.



(2b) Sheet Metal Base Flashing shall extend not less than six (6) ins. up on vertical wall and not less than six (6) ins. out on roof over the base felts. The angle formed in flashing shall not be sharply bent but shall be rounded and the flashing shall be nailed along its edge into deck or wood nailing strips provided therein.

(2c) Where asphalt is used, metal flashing on the deck shall be primed with Bird Asphalt Primer and allowed to dry.

(2d) An eight (8) in. strip and a ten (10) in. strip of Bird 15 lb. Asphalt Felt shall be embedded in a hot mopping of Bird Roofing Asphalt over the metal flashing extending on the roof. The roof shall then be finished over the Felt Strip with gravel, slag or tile as called for in Roofing Specification.

Application of Cap Flashing

Metal Cap Flashing shall be bent down over the Base Flashing so that Cap Flashing shall lap Base Flashing four (4) ins.

Where Raggle Block Is Specified

SPECIFICATION NO. 6

Preliminary

The Raggle Block shall be set in masonry wall with the bottom of the Raggle Block in a line five (5) ins. from, and parallel with, the grade line of roof at wall. Raggle Block shall be set in Portland Cement mortar with all joints properly pointed, and the groove shall be thoroughly cleaned of any foreign material.

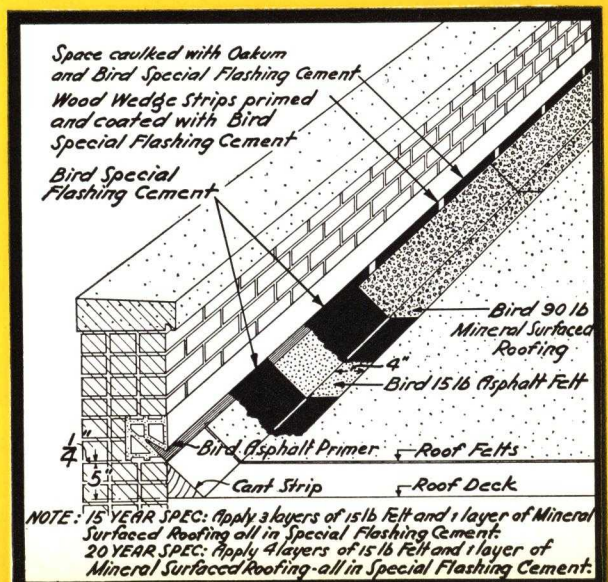
Cant Strips, constructed of material that will permit nailing, shall be installed at the angle formed by intersection of vertical surface with the roof deck. Upper edge of Cant Strip shall be approximately one-quarter (¼) in. below groove of Raggle Block. Face of Cant Strip shall be built parallel with bottom of groove of the Raggle Block.

All Roofing Felts, Base Sheets and Cap Sheets shall be laid before the Flashing is applied and shall be carried up to top of the cant and cut off at the wall line.

Flashing shall be installed before the application of gravel, slag or tile to roof surface.

Application of Flashing

(1) A coat of Bird Asphalt Primer shall be applied to groove of Raggle Block and allowed to dry.



(2) A layer of Bird Special Flashing Cement approximately one-eighth (⅛) in. thick shall be applied for full depth of the groove of Raggle Block and over roofing felts to a point on deck four (4) ins. from bottom of Cant Strip.

(3) One (1) layer of Bird 15 lb. Asphalt Felt and one (1) layer of Bird 90 lb. Mineral Surfaced Roofing shall be cut into suitable widths to extend from back of groove of Raggle Block out on the roof four (4) ins.

(4) The Bird 15 lb. Asphalt Felt shall be embedded in the Special Flashing Cement.

(5) The Asphalt Felt shall be coated with a layer of Bird Special Flashing Cement. The Mineral Surfaced Roofing shall be embedded in the Special Flashing Cement, breaking joints with the previously applied 15 lb. Asphalt Felt. End laps shall be not less than three (3) ins.

(6) Wood wedge strips, primed and coated with Bird Special Flashing Cement shall be driven into flashing groove on twelve (12) in. centers and at all laps. Remaining space in flashing groove shall be caulked with Bird Special Flashing Cement.

Note: 15 Year Roof—Three (3) layers of Bird 15 lb. Asphalt Felt and one (1) layer of Mineral Surfaced Roofing shall all be embedded in Bird Special Flashing Cement.

20 Year Roof—Four (4) layers of Bird 15 lb. Asphalt Felt and one (1) layer of Mineral Surfaced Roofing shall all be embedded in Bird Special Flashing Cement.

Where Flashing Is Not Less Than 8" High

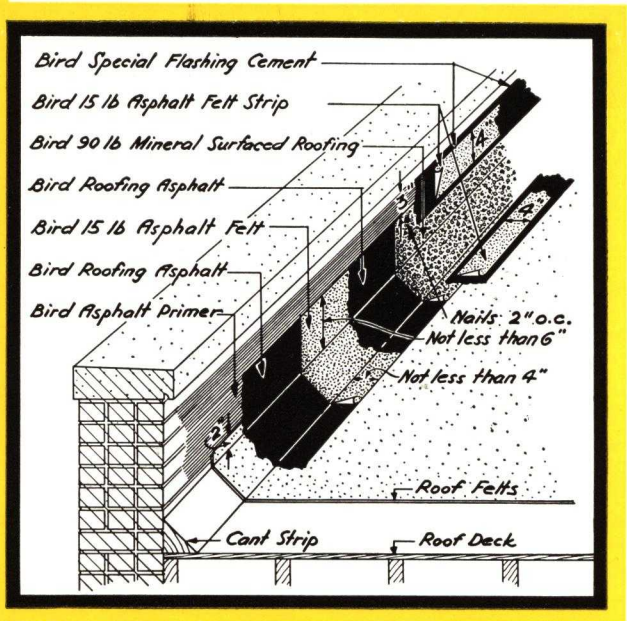
SPECIFICATION NO. 1

Preliminary

Cant Strips constructed of material that will permit nailing, shall be installed at the angle formed by intersection of vertical surface with roof. Cant Strip shall extend up the vertical surface approximately four (4) ins. and have an angle of forty-five (45) degrees with the vertical. All measurements "Up" on the vertical surfaces and "Out" on the roof deck shall be made from line of intersection of cant with the vertical surface and the line of intersection of cant with the roof surface, respectively.

All Roofing Felts, Base Sheets and Cap Sheets shall be laid before the Flashing is applied and shall be brought up the face of cant and turned up two (2) ins. on, but not cemented to, all vertical surfaces to be flashed.

Flashing shall be installed before application of gravel, slag or tile to the roof surface.



Preparation of Surfaces to Be Flashed

All masonry surfaces to be flashed shall be coated with Bird Asphalt Primer and allowed to dry.

Application of Base Flashing

(1) Base Flashing shall be composed of one (1) layer of Bird 15 lb. Asphalt Felt and one (1) layer of Bird 90 lb. Mineral Surfaced Roofing cemented to underlying surface and together with hot moppings of Bird Roofing Asphalt.

Note: In roofs employing Pitch, either Asphalt or Pitch may be used where Asphalt Mopping is specified.

(2) Base Flashing shall extend not less than six (6) ins. up on vertical surfaces and not less than four (4) ins. out on roof and shall be nailed adjacent to its upper edge and at end laps with approved large head galvanized nails spaced two (2) ins. center to center.

(3) Edge of Base Flashing on roof shall be covered with a four (4) in. wide strip of Bird 15 lb. Asphalt Felt embedded in and coated over with Bird Roofing Asphalt.

(4) End joints of Base Flashing shall be covered with a trowelled coat of Bird Special Flashing Cement into which shall be embedded a four (4) in. wide strip of Bird 15 lb. Asphalt Felt. Felt Strip shall be finished with a second trowelled coat of Bird Special Flashing Cement.

Application of Cap Flashing

(1) A layer of Bird Special Flashing Cement approximately one-eighth (⅛) in. thick and not less than five (5) ins. wide shall be trowelled on to cover nail heads, the upper edge of Base Flashing and the adjoining wall surface.

(2) A strip of Bird 15 lb. Asphalt Felt four (4) ins. wide shall be embedded in the Special Flashing Cement and an additional layer of Special Flashing Cement shall be trowelled on over the felt and finished to a feather edge and a straight line.

(3) If a sheet metal cap flashing is specified, the above Cap Flashing shall extend to where such metal projects from wall.

Where Flashing Covers the Entire Inside Wall and Top Wall Under Coping

SPECIFICATION NO. 2

Preliminary

Cant Strips constructed of material that will permit nailing, shall be installed at the angle formed by intersection of vertical surface with roof. Cant Strip shall extend up the vertical surface approximately four (4) ins. and have an angle of forty-five (45) degrees with the vertical. All measurements "Up" on vertical surfaces and "Out" on roof deck shall be made from line of intersection of cant with vertical surface and the line of intersection of cant with roof surface respectively.

All Roofing Felts, Base Sheets and Cap Sheets shall be laid before the Flashing is applied and shall be brought up the face of cant and turned up two (2) ins. on, but not cemented to, all vertical surfaces to be flashed.

Flashing shall be installed before application of gravel, slag or tile to the roof surface.

Preparation of Surfaces to Be Flashed

All masonry surfaces to be flashed shall be coated with Bird Asphalt Primer and allowed to dry.

Application of Base Flashing

(1) Base Flashing shall be composed of one (1) layer of Bird 15 lb. Asphalt Felt and one (1) layer of Bird 90 lb. Mineral Surfaced Roofing cemented to underlying surface and together with hot moppings of Bird Roofing Asphalt.

Note: In roofs employing Pitch, either Asphalt or Pitch may be used where Asphalt Mopping is specified.

(2) Base Flashing shall extend not less than six (6) ins. up on vertical surfaces and not less than four (4) ins. out on roof and shall be nailed adjacent to its upper edge and at end laps with approved large head galvanized nails spaced two (2) ins. center to center.

(3) Edge of Base Flashing on roof shall be covered with a four (4) in. wide strip of Bird 15 lb. Asphalt Felt embedded in and coated over with Bird Roofing Asphalt.

(4) End joints of Base Flashing shall be covered with a trowelled coat of Bird Special Flashing Cement into which shall be embedded a four (4) in. wide strip of Bird 15 lb. Asphalt Felt. Felt Strip shall be finished with a second trowelled coat of Bird Special Flashing Cement.

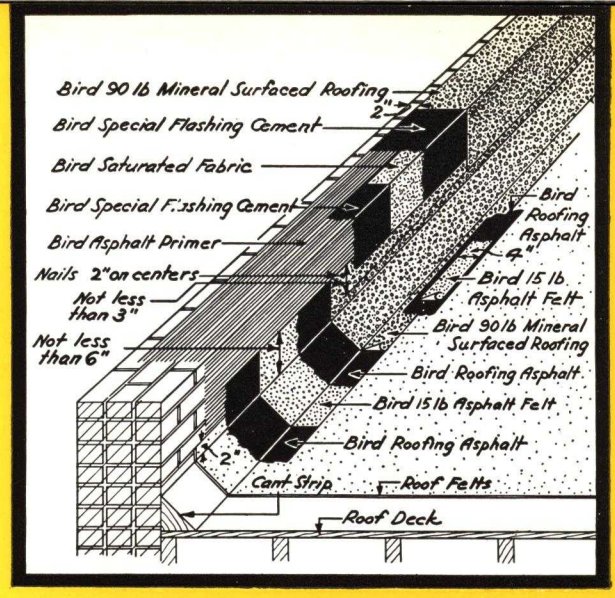
Application of Cap Flashing

(1) A layer of Bird Special Flashing Cement approximately one-eighth (⅛) in. thick shall be trowelled on to cover nail heads, the upper edge of Base Flashing, the entire inner face of wall and top of wall under coping to within two (2) ins. of outside face of wall.

(2) A strip of Bird Saturated Fabric eight (8) ins. wide shall be embedded in the Special Flashing Cement along the inner top corner of wall so that it shall extend four (4) ins. on top of wall and four (4) ins. on face of wall. This reinforcing Fabric Strip shall then be coated with Bird Special Flashing Cement.

(3) A strip of Bird 90 lb. Mineral Surfaced Roofing, wide enough to extend from within two (2) ins. of outside wall under the coping and down to cover the Base Flashing at least three (3) ins., shall be embedded in Bird Special Flashing Cement.

Alternate Specification: Bird 15 lb. Asphalt Felt, coated with Bird Special Flashing Cement may be used instead of Bird 90 lb. Mineral Surfaced Roofing in the above Cap Flashing Specification.



Where Flashing Is Not Less Than 8" High With Cap Flashing Extending Through Wall

SPECIFICATION NO. 3

Preliminary

Cant Strips constructed of material that will permit nailing, shall be installed at the angle formed by intersection of vertical surface with roof. Cant Strip shall extend up the vertical surface approximately four (4) ins. and have an angle of forty-five (45) degrees with the vertical. All measurements "Up" on the vertical surfaces and "Out" on the roof deck shall be made from line of intersection of cant with the vertical surface and the line of intersection of cant with the roof surface, respectively.

All Roofing Felts, Base Sheets and Cap Sheets shall be laid before the Flashing is applied and shall be brought up the face of cant and turned up two (2) ins. on, but not cemented to, all vertical surfaces to be flashed.

Flashing shall be installed before application of gravel, slag or tile to the roof surface.

Preparation of Surfaces to Be Flashed

All masonry surfaces to be flashed shall be coated with Bird Asphalt Primer and allowed to dry.

Application of Base Flashing

(1) Base Flashing shall be composed of one (1) layer of Bird 15 lb. Asphalt Felt and one (1) layer of Bird 90 lb. Mineral Surfaced Roofing cemented to underlying surface and together with hot moppings of Bird Roofing Asphalt.

Note: In roofs employing Pitch, either Asphalt or Pitch may be used where Asphalt Mopping is specified.

(2) Base Flashing shall extend not less than six (6) ins. up on vertical surfaces and not less than four (4) ins. out on roof and shall be nailed adjacent to its upper edge and at end laps with approved large head galvanized nails spaced two (2) ins. center to center.

(3) Edge of Base Flashing on roof shall be covered with a four (4) in. wide strip of Bird 15 lb. Asphalt Felt embedded in and coated over with Bird Roofing Asphalt.

(4) End joints of Base Flashing shall be covered with a trowelled coat of Bird Special Flashing Cement into which shall be embedded a four (4) in. wide strip of Bird 15 lb. Asphalt Felt. Felt Strip shall be finished with a second trowelled coat of Bird Special Flashing Cement.

Application of Cap Flashing

(1) The construction of vertical wall shall be stopped at elevation at which the Cap Flashing is to be installed and shall be finished smooth on top. This top finish shall then be coated with a layer of Bird Special Flashing Cement approximately one-eighth (⅛) in. thick, extending to within two (2) ins. of outside face of wall.

(2) A strip of Bird Saturated Fabric wide enough to cover the cemented portion of top of wall and to extend out from inside face of wall far enough to cover top of base flashing four (4) ins., shall be embedded in the Bird Special Flashing Cement.

(3) A second layer of Bird Special Flashing Cement shall be applied to part of Saturated Fabric embedded on top of wall.

(4) A strip of Bird 15 lb. Asphalt Felt, the same width as the Saturated Fabric and extending out from wall as does the Fabric, shall be embedded in Bird Special Flashing Cement.

(5) The Felt on top of wall shall then be coated with a layer of Bird Special Flashing Cement and the portion of fabric and felt extending from wall shall be protected so that it will not be damaged during the completion of the wall.

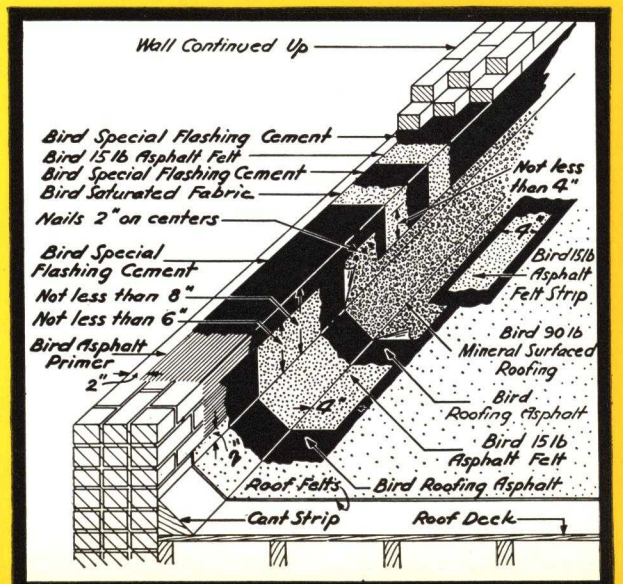
(6) After Base Flashing has been installed, a layer of Bird Special Flashing Cement extending from where Cap Flashing leaves the wall down over the upper edge of Base Flashing, at least four (4) ins., shall be applied.

(7) The Saturated Fabric of the Cap Flashing shall next be embedded in Bird Special Flashing Cement.

(8) A second layer of Bird Special Flashing Cement shall be applied over the Saturated Fabric.

(9) The Bird 15 lb. Asphalt Felt of the Cap Flashing shall also be embedded in the Bird Special Flashing Cement.

(10) A layer of Bird Special Flashing Cement shall be trowelled over the Asphalt Felt and finished to a feather edge and to a straight line.



Where No Nailing Facilities Are Provided

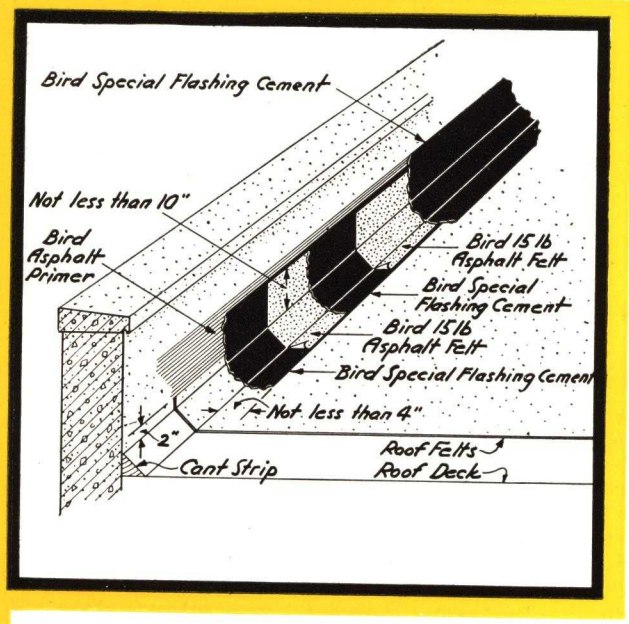
SPECIFICATION NO. 4

Preliminary

Cant Strips constructed of material that will permit nailing, shall be installed at the angle formed by intersection of vertical surface with roof. Cant Strip shall extend up the vertical surface approximately four (4) ins. and have an angle of forty-five (45) degrees with the vertical. All measurements "Up" on the vertical surfaces and "Out" on the roof deck shall be made from line of intersection of cant with the vertical surface and the line of intersection of cant with the roof surface, respectively.

All Roofing Felts, Base Sheets and Cap Sheets shall be laid before the Flashing is applied and shall be brought up the face of cant and turned up two (2) ins. on, but not cemented to, all vertical surfaces to be flashed.

Flashing shall be installed before application of gravel, slag or tile to the roof surface.



Preparation of Surfaces to Be Flashed

All masonry surfaces to be flashed shall be coated with Bird Asphalt Primer and allowed to dry.

Application of Base Flashing

(1) A layer of Bird Special Flashing Cement approximately one-eighth (⅛) in. thick shall be trowelled on the surface to receive the Flashing. The Flashing shall be carried at least ten (10) ins. high on the wall and four (4) ins. out on the roof.

(2) A layer of Bird 15 lb. Asphalt Felt shall be embedded in the Bird Special Flashing Cement.

(3) A second layer of Special Flashing Cement shall be applied to the Bird 15 lb. Asphalt Felt.

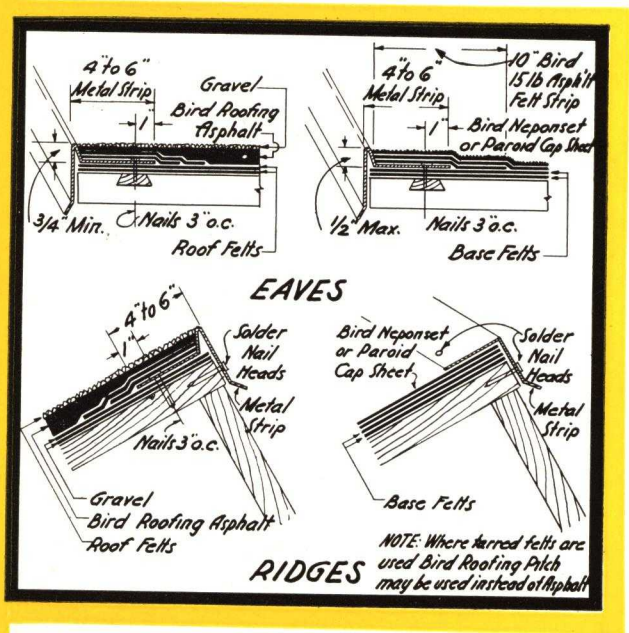
(4) A second layer of Bird 15 lb. Asphalt Felt shall be embedded in the Special Flashing Cement, breaking joints with the previously applied felt.

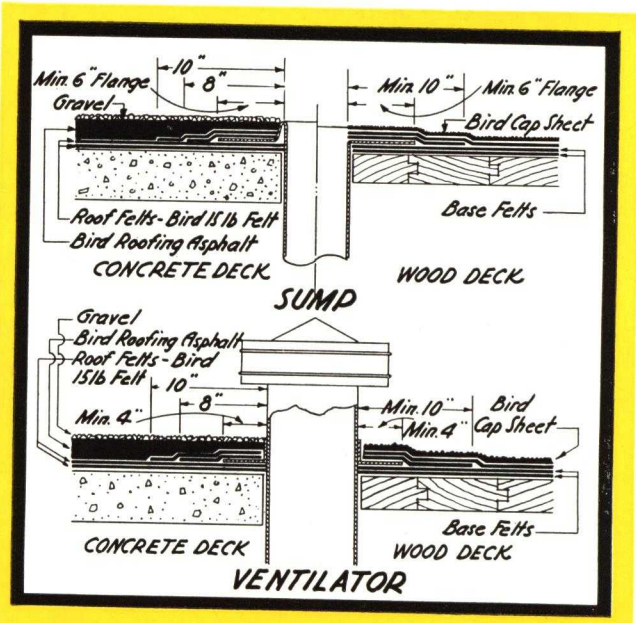
(5) The Flashing shall be finished by trowelling a third layer of Bird Special Flashing Cement over the surface of the Asphalt Felt, finishing to a feather edge and a straight line.

MISCELLANEOUS FLASHING DETAILS

The following details show standard construction for the finishing at Eaves, Ridges, and for Sump and Ventilator connections.

Specifications for Flanges and Edgings to meet special conditions will be furnished when requested.





The organization making

BIRD BUILDING PRODUCTS

Established 1795 . . . when Washington was President

FOUNDED in 1795, the continuous success of Bird & Son, inc., has proved the sound principles upon which Bird makes and distributes its products. A long time in business means much when demonstrated stability is coupled with a quality line of materials.

This high quality of products has been secured and maintained by constant research by the Bird laboratories and the rigid control of production exercised in the mills. This unceasing research and experimentation has resulted in the introduction of many outstanding products such as Thick Butt Shingles, Shatter Resistant Coating, Quick Setting Lap Cement, and numerous other improvements.

While this book is devoted to Bird Built-up Roofs, it is of interest to know that Bird manufactures and distributes Asphalt Mineral Surfaced Shingles and Sidings, Roll Roofings, Insulating Materials and Wallboards, Neponset Felt Base Rugs and Floor Coverings, Shipping Cases and Cartons, Flower Pots and Special Papers.

For Index to Specifications, see page 2.

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3

BIRD

BUILT-UP ROOFING

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WATER PROOF

1939

MASTER SPECIFICATIONS

Carey BUILT-UP ROOFS

BONDED 5·10·20 YEARS

Carey BUILT-UP ROOFING

AT the request of hundreds of architects we have condensed the various types of CAREY BUILT-UP ROOFING SPECIFICATIONS in such a manner as to enable us to reproduce every type of roof construction in a complete, comprehensive manner in this issue of SWEET'S ARCHITECTURAL CATALOGUES.

Every essential type of built-up roof construction, with definite recommendations as to the service adaptability of each, is incorporated in CAREY'S TWELVE (12) MASTER BUILT-UP ROOFING SPECIFICATIONS. In specifying any one of the twelve Master Specifications the architect should always indicate, in addition to the Master Built-up Roofing Specification number, the type of roof construction desired, i.e., Types A, B, C or D. He should also indicate any special conditions listed under "General Requirements Applying to All Types," such as: bond period, deck treatment, requirements for steep deck application and roof surfacing, etc., applying to the particular job.

Note: *When application is to be over wood or gypsum decks select deck treatment in accordance with type of deck.*

The minimum requirements for every item entering into the construction of Carey Built-up Roofs are well known, nationally accepted standards, re-enforced with a definite tolerance in quality. These standards of quality are established, controlled, and maintained by Carey engineers, research laboratories, and extensive modern factory facilities.

Architects may specify the types of Carey Roofs described in this catalogue with confidence, for use on all standard types of deck construction, and they are invited to correspond with the Engineering Department of THE PHILIP CAREY COMPANY for recommendations as to the roofing or waterproofing construction especially adapted to special types of deck construction or special specifications to meet unusual service conditions.

The specifications cover the following types of construction:

SLAG OR GRAVEL SURFACED ROOFS

Ten (10) and twenty (20)-year roof construction for application over all types of decks. Various types comprise:

Asphalt Saturated Rag Felt construction, slag or gravel surfaced.

Tar Saturated Rag Felt construction, slag or gravel surfaced.

Combination Asphalt Impregnated Asbestos and Asphalt Saturated Rag Felt construction, slag or gravel surfaced.

MINERAL SURFACED ROOFS

Ten (10) and twenty (20)-year roof construction for application over all types of decks. Various types comprise:

Asphalt Saturated Rag Felt construction, mineral surfaced.

Combination Asphalt Impregnated Asbestos and Asphalt Saturated Rag Felt construction, mineral surfaced.

Asphalt Impregnated Asbestos Felt construction, mineral surfaced.

ASPHALT SURFACED ROOFS

Ten (10) and twenty (20)-year roof construction for application over all types of decks. Various types comprise:

Asphalt Impregnated Asbestos Felt construction, asphalt surfaced.

Asphalt Saturated Rag Felt construction, asphalt surfaced.

Combination Asphalt Impregnated Asbestos and Asphalt Saturated Rag Felt construction, asphalt surfaced.

The recommendations governing the adaptability of each type and the application details incorporated in each type of built-up roof are the results of over half a century of manufacturing and application experience and are given in the hope that architects will carefully consider the wisdom of each recommendation.

Permanent satisfaction in built-up roof construction can only be assured when the proper type is selected to meet existing service conditions. Three vital points to be carefully considered when specifying various types of roofs are:

(1) Incline in roof deck and type of roof deck.

(2) Climatic conditions affecting the geographic location of the job.

(3) Presence of industrial gases and fumes detrimental to certain types of roof construction.

THE PHILIP CAREY COMPANY

GENERAL OFFICES AND MAIN FACTORY: LOCKLAND, OHIO
OTHER FACTORIES: FRANKLIN, OHIO; ST. LOUIS, MISSOURI; and PLYMOUTH MEETING, PA.

ASBESTOS MINES: EAST BROUGHTON, QUEBEC
BRANCHES AND DISTRIBUTERS IN ALL PRINCIPAL CITIES

For Carey Shingles and Pipe Coverings, see File Index

CAREY FELT (FELTEX)

The Carey Felt (Feltex) furnished for use in Carey Built-up Roofing Specifications is manufactured on the highest grade rag felt base and saturated with an asphalt developed especially for roofing purposes by our research laboratory and processed in our own plant. The saturant used in Carey Felt (Feltex) is of such a nature that it allows the felt to be handled as easily in cold weather as in summertime.

Carey Felt (Feltex) is 36 ins. wide, packaged in rolls containing four squares or 432 sq. ft. per roll, weight per 100 sq. ft., 15 lbs., weight per roll, approximately 65 lbs.

CAREY FIBEROCK

Carey Fiberock as manufactured for use in Carey Built-up Roofing Specifications consists of an asbestos felt that contains 85% asbestos fibers held together with a combining material and impregnated with a high grade asphalt saturant developed and processed in our own laboratories and plant. There are two weights of Carey Fiberock. The 15-lb. Fiberock is impregnated with asphalt only, while the 20-lb. Fiberock is impregnated and coated one side with asphalt. Both weights are packaged in 3 square rolls containing 324 sq. ft. per roll, 36 ins. wide. The 15-lb. weighs 45 lbs. per roll and the 20-lb., 60 lbs. per roll.

CAREY-SEAL TAR FELT

Carey-Seal Tar Felt as furnished for use in Carey Built-up Roofing Specifications is manufactured on a high grade rag felt base and saturated with a tar pitch saturant developed for this purpose. Carey-Seal Tar Felt is 32 ins. wide packaged in rolls containing 4 squares or 432 sq. ft. per roll; weight per 100 sq. ft., 15 lbs.; weight per roll, approximately 65 lbs.

CAREY ASBESTOS FELT

The Carey Asbestos Felt Base Sheets furnished for use in Carey Asbestos Specification Roofs are made on an asbestos felt base of the best quality. This asbestos base is impregnated with asphalt and then coated and sanded on both sides. The saturant developed for this particular purpose and the coating asphalt is likewise an asphalt processed for coating purposes only, and thereby seals the base sheet against all attacks of moisture.

Carey Asbestos Felt Base Sheets are packaged in two weights, 45 lbs. and 60 lbs. and are put up in one square rolls containing 108 sq. ft., the roll weight being approximately 48 lbs. for the 45-lb. sheet and approximately 65 lbs. for the 60-lb. sheet.

CAREY ASPHALT

The Carey Roofing Asphalt furnished for application of Carey Specification Roofs is an asphalt blended in such a way that it contains all properties necessary to give long life and durability to the roof. Carey Asphalt contains practically no impurities and is 99.5% soluble in carbon disulphide. Carey Asphalt is packaged in open head drums containing approximately 400 lbs. per drum.

CAREY-SEAL TAR PITCH

The Carey-Seal Tar Pitch furnished for application of Carey Tar Pitch Specification Roofs is a high grade coal tar pitch developed for use in constructing tar or gravel roofs. This material has unusual waterproofing qualities and, therefore, tends to form the basis for a serviceable and durable roof. Carey-Seal Tar Pitch is packaged in drums containing approximately 500 lbs. per drum.

THE *Carey* ROOFINDER *Index*

DECK	BOND	INCLINE in. per ft.	SURFACE	SECTION of U. S.	SPEC. NO.	PAGE NO.	UNDERWRITERS RATING
WOOD or GYPSUM	20-YEAR	Level-2″ 2″-6″ Level-¾″	Slag or Gravel	All	1	4	Class A
		¾″-6″	Asphalt	North, East and All	9	12	Class A or C
		¾″-6″	Mineral	All	5	8	Class C
	10-YEAR	Level-2″ 2″-6″ Level-¾″	Slag or Gravel	All	2	5	Class A
		¾″-6″	Asphalt	North, East and All	10	13	Class A or C
		¾″-6″	Mineral	All	6	9	Class C
CONCRETE or STEEL	20-YEAR	Level-1½″ 1½″-6″ Level-¾″	Slag or Gravel	All	3	6	Class A
		¾″-1½″	Asphalt	North, East and All	11	15	Class A or C
		¾″-1½″	Mineral	All	8	11	Class C
	10-YEAR	Level-1½″ 1½″-6″ Level-¾″	Slag or Gravel	All	4	7	Class A
		¾″-1½″	Asphalt	North, East and All	12	16	Class A or C
		¾″-1½″	Mineral	All	7	10	Class C

NUMBER

1

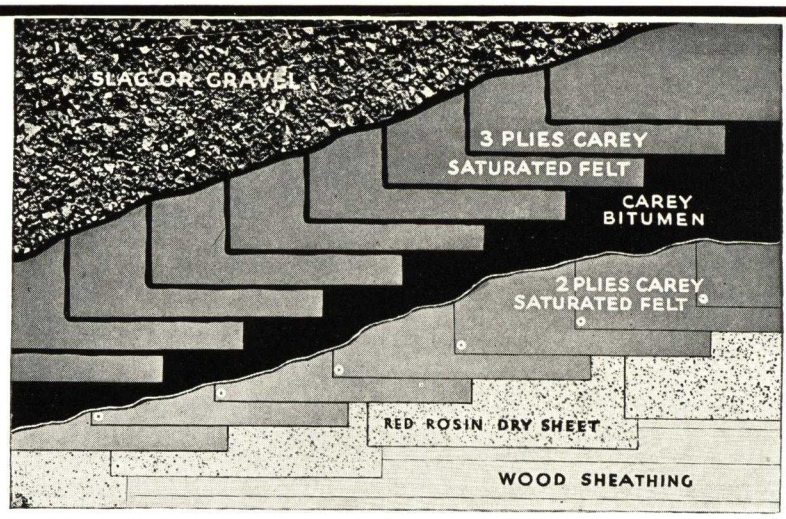
Bond: 20-Year

DECK • WOOD or PRECAST GYPSUM

INCLINES • LEVEL-2 IN. per Foot
2 IN. to 6 IN. per Foot

CONSTRUCTION • ASPHALT or TAR

SURFACE • SLAG or GRAVEL



Carey 20-Year Master Built-up Roofing Specification No. 1

TWO OPTIONAL TYPES • and the Service Adaptability of Each

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Type of Mopping	Weight, lbs. per ply of Felt per square	Weight, lbs. Asphalt or Tar per square	Weight, lbs. of Slag per square	Weight, lbs. of Gravel per square
			Rec.	Not Rec.							
A	All	Level to 2" 2"-6"	.....	X	Class A	5 Plies Carey Feltex (Asphalt Saturated Rag Felt)	Carey Asphalt	15	135	300	400
B	All	Level to 3/4	.....	X	Class A	5 Plies Carey-Seal Tarred Felt (Tar Saturated Rag Felt)	Carey-Seal Tar Pitch	15	150	300	400

DECK SURFACES

Before the Built-up Roofing Specification is applied the deck shall be covered with a layer of Red Rosin Sized Sheathing weighing not less than 5 lbs. per 100 sq. ft., same to be lapped approximately 2 ins. and secured to the deck by occasional nailing.

Nails to be used in securing the Built-up Roofing Specification in the manner described under "Application" shall be either 1-in. roofing nails driven through flat tin caps, or 1-in. "Simplex" nails.

APPLICATION

TYPE A—Specification No. 1

Five plies of CAREY FELTEX (Asphalt Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 135 lbs. of CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 1—Type A.

The felts used in the construction of the roof shall be 36 ins. wide. The first two sheets shall be laid dry, lapped 19 ins., leaving 17 ins. exposed, and be secured to the deck by occasional nailing. To the surface thus provided a mopping of asphalt shall be applied into which, while hot, shall be embedded three sheets of felt, each sheet to overlap the previous sheet 25 ins., leaving 11 ins. exposed. Solid moppings of Asphalt shall be applied between the plies of this three-ply construction so that at no point shall felt touch felt.

To the top surface of this construction a flood coat of hot Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. Asphalt shall not be heated over 400° F.

Application of Specification No. 1—Type A on Incline of 2 In. to 6 In. Per Foot (Asphalt Construction Only)

In applying this specification on wood or precast gypsum decks having a slope greater than 2 in. per foot and not exceeding 6 in. per foot, the top three plies shall be nailed at a point 6 in. from the back edge of each sheet as same is embedded in the hot asphalt. Nails to be spaced on approximately 8-in. centers and felt to be laid at right angles to the slope of the roof.

Carey Steep Roofing Asphalt shall be used throughout.

TYPE B—Specification No. 1

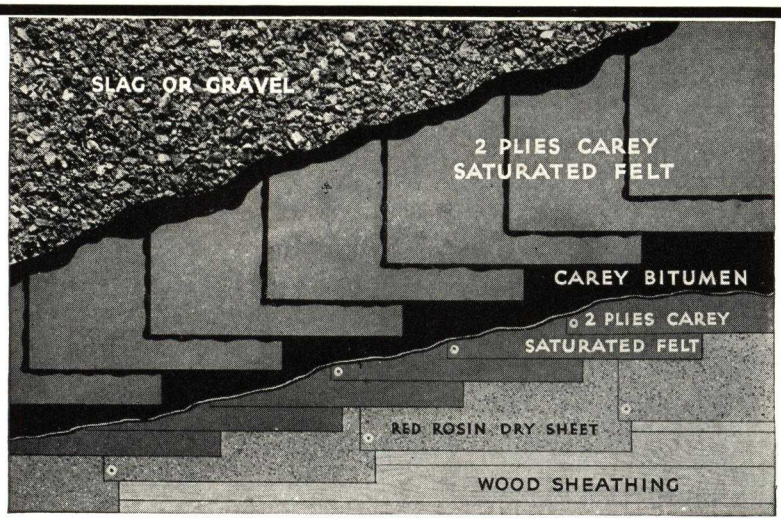
Five plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 150 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 1—Type B.

The felts used in the construction of this roof shall be 32 ins. wide. The first two sheets shall be laid dry, lapped 17 ins., leaving 15 ins. exposed, and be secured to the deck by occasional nailing. To the surface thus provided a mopping of Tar Pitch shall be applied into which, while hot, shall be embedded three sheets of felt, each sheet to overlap the previous sheet 22 ins., leaving 10 ins. exposed. Solid moppings of Tar Pitch shall be applied between the plies of this three-ply construction so that at no point shall felt touch felt.

To the top surface of this construction a flood coat of hot Tar Pitch shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. Tar Pitch shall not be heated over 400° F.

BOND CLAUSE

The roofing contractor shall furnish THE PHILIP CAREY MANUFACTURING COMPANY'S 10-Year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.



Carey 10-Year Master Built-up Roofing Specification No. 2

NUMBER **2**

Bond · 10-Year

DECK • WOOD or PRECAST GYPSUM

INCLINE • LEVEL-2 IN. per foot
2 IN. to 6 IN. per foot

CONSTRUCTION • ASPHALT or TAR

SURFACE • SLAG or GRAVEL

TWO OPTIONAL TYPES • and the Service Adaptability of Each

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Type of Mopping	Weight, lbs. per ply of Felt per square	Weight, lbs. Asphalt or Tar per square	Weight, lbs. of Slag per square	Weight, lbs. of Gravel per squa
			Rec.	Not Rec.							
A	All	Level to 2 2 - 6	.....	X	Class A	4 Plies Carey Feltex (Asphalt Saturated Rag Felt)	Carey Asphalt	15	100	300	400
B	All	Level to ¾	.....	X	Class A	4 Plies Carey-Seal Tarred Felt (Tar Saturated Rag Felt)	Carey-Seal Tar Pitch	15	125	300	400

DECK SURFACES

Before the Built-up Roofing Specification is applied the deck shall be covered with a layer of Red Rosin Sized Sheathing, weighing not less than 5 lbs. per square, same to be lapped approximately 2 ins. and secured to the deck by occasional nailing.

Nails to be used in securing the Built-up Roofing Specification in the manner described under "Application" shall be either 1-in. roofing nails driven through flat tin caps or 1-in. "Simplex" nails.

APPLICATION

TYPE A—Specification No. 2

Four plies of CAREY FELTEX (Asphalt Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 100 lbs. of CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 2—Type A.

The Feltex used in the construction of this roof shall be 36 ins. wide. The first two sheets shall be laid dry, lapped 19 ins., leaving 17 ins. exposed, and be secured to the deck by occasional nailing. To the surface thus provided a solid mopping of Asphalt shall be applied, into which, while hot, shall be embedded two sheets of felt, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the two top plies, so that at no point shall felt touch felt. To the surface thus provided a mopping of Tar Pitch shall be applied into which, while hot, shall be embedded three sheets of felt. To the top surface of this construction a flood coat of Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. Asphalt shall not be heated over 400° F.

Application of Specification No. 2—Type A on Incline of 2" to 6" per Foot (Asphalt Construction Only)

In applying this specification on wood or pre-cast gypsum decks having a slope greater than 2 ins. per foot and not exceeding 6 ins. per foot, the top two plies shall be nailed at a point 1½ ins. from the back edge of each sheet as same is embedded in the hot asphalt. Nails to be spaced on approximately 8 in. centers and felt to be laid at right angles to the slope of the roof.

Carey Steep Roofing Asphalt shall be used throughout.

TYPE B—Specification No. 2

Four plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 125 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 2—Type B.

The CAREY-SEAL TARRED FELT used in the construction of this roof shall be 32 ins. wide. The first two sheets shall be laid dry, lapped 17 ins., leaving 15 ins. exposed and secured to the deck by occasional nailing. To the surface thus provided a solid mopping of Tar Pitch shall be applied, into which, while hot, shall be embedded two sheets of felt, each sheet to overlap the previous sheet 17 ins., leaving 15 ins. exposed. Solid moppings of Tar Pitch shall be applied between the two top plies of felt so that at no point shall felt touch felt. To the top surface of this construction a flood coat of Tar Pitch shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. Tar Pitch shall not be heated over 400° F.

BOND CLAUSE

The roofing contractor shall furnish THE PHILIP CAREY MANUFACTURING COMPANY'S 10-Year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.

NUMBER

3

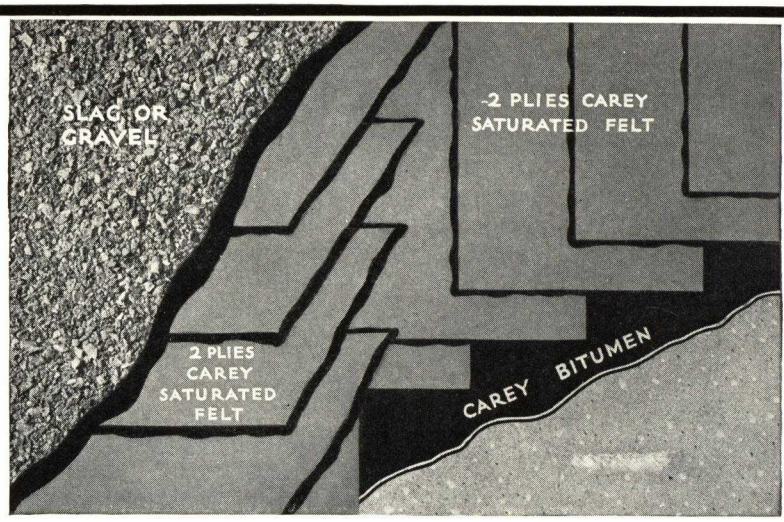
Bond: 20-Year

DECK • CONCRETE STEEL POURED GYPSUM or INSULATED

INCLINE • LEVEL-1½ IN. per Foot 1½ IN. to 6 IN. per Foot

CONSTRUCTION • ASPHALT or TAR

SURFACE • SLAG or GRAVEL



Carey 20-Year Master Built-up Roofing Specification No. 3

TWO OPTIONAL TYPES • and the Service Adaptability of Each

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Type of Mopping	Weight, lbs. per ply of Felt per square	Weight, lbs. Asphalt or Tar per square	Weight, lbs. of Slag per square	Weight, lbs. of Gravel per square
			Rec.	Not Rec.							
A	All	Level to 1½ 1½ - 6	.....	X	Class A	4 Plies Carey Feltex (Asphalt Saturated Rag Felt)	Carey Asphalt	15	175	300	400
B	All	Level to ¾	.....	X	Class A	4 Plies Carey-Seal Tarred Felt (Tar Saturated Rag Felt)	Carey-Seal Tar Pitch	15	190	300	400

DECK SURFACES

Concrete: Before roofing is applied concrete deck must be thoroughly dry and free from frost, loose sand or debris. All low spots or depressions removed to provide satisfactory drainage.

Steel: Before roofing is applied all steel decks must first be covered with a layer of approved roof insulation at least ½-in. thick, said insulation to be bonded to steel deck with hot asphalt.

APPLICATION

TYPE A—Specification No. 3

Four plies of CAREY FELTEX (Asphalt Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 175 lbs. CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 3—Type A.

The Feltex used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be mopped with a heavy coat of Asphalt, into which, while hot, two sheets of felt shall be embedded and mopped solid between the sheets with Asphalt, each sheet overlapping the previous sheet 19 ins., leaving 17 ins. exposed. The surface of this two-ply construction shall then be mopped with Asphalt, into which, while hot, two additional sheets of felt shall be applied at right angles to the first two plies, each sheet overlapping the previous sheet 19 ins., leaving 17 ins. exposed. The last two plies shall be bonded together with a solid mopping of Asphalt so that at no point shall felt touch felt. To the top surface of this construction a flood coat of Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. CAREY ASPHALT used in constructing the roof shall not be heated over 400° F.

Application of Specification 3—Type A on Incline of 1½ In to 6 In. Per Ft. (Asphalt Construction Only)

In applying this specification on a concrete deck having a slope greater than 1½ ins. per foot and not exceeding 6 ins. per foot, wooden nailing strips shall be provided spaced not greater than three feet on centers, if concrete deck will not allow for nailing. Wooden nailing strips, when provided, shall be laid parallel to slope of deck.

All sheets of felt shall be laid at right angles to the slope of deck and each sheet nailed 9 ins. from the back edge with 1 in. roofing nails driven through flat tin caps or 1 in. Simplex Nails, all nails to be spaced on 1 ft. centers.

If wooden nailing strips are provided two nails are to be used at each nailing point, one nail to be 9 ins. from back edge of sheet and one to be 7 ins. from back edge of sheet.

Carey Steep Roofing Asphalt shall be used throughout.

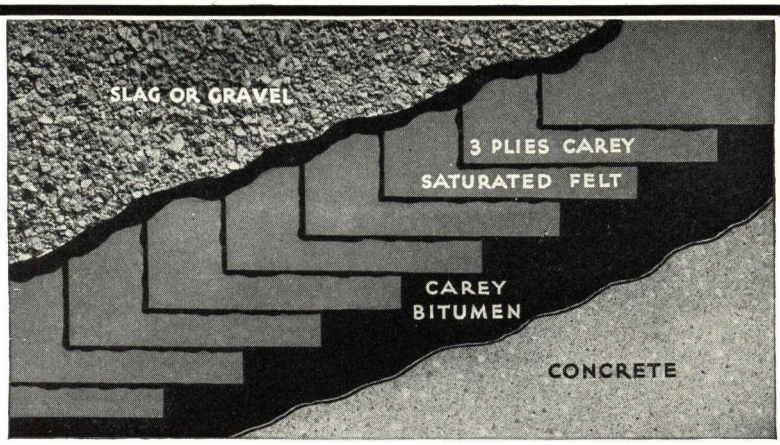
TYPE B—Specification No. 3

Four plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft. and not less than 190 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 3—Type B.

The CAREY-SEAL TARRED FELT used in the construction of this roof shall be 32 ins. The roof surface shall first be mopped with a heavy coat of Tar Pitch, into which, while hot, two sheets of felt shall be embedded and mopped solid between the sheets with Tar Pitch, each sheet to overlap the previous sheet 17 ins., leaving 15 ins. exposed. The surface of this two-ply construction shall then be mopped with Tar Pitch, into which, while hot, two additional sheets of felt shall be applied at right angles to the first two plies, each sheet overlapping the previous sheet 17 ins., leaving 15 ins. exposed. The last two plies shall be bonded together with a solid mopping of Tar Pitch so that at no point shall felt touch felt. To the top surface of this construction a flood coat of hot Tar Pitch shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. CAREY-SEAL TAR PITCH used in the construction of this roof shall not be heated over 400° F.

BOND CLAUSE

The roofing contractor shall furnish THE PHILIP CAREY MANUFACTURING COMPANY'S 20-year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.



Carey 10-Year Master Built-up Roofing Specification No. 4

NUMBER
4

Bond: 10-Year

DECK • CONCRETE STEEL POURED GYPSUM or INSULATED
INCLINE • LEVEL-1½ IN. per Foot
1½ IN. to 6 IN. per Foot
CONSTRUCTION • ASPHALT or TAR
SURFACE • SLAG or GRAVEL

TWO OPTIONAL TYPES • and the Service Adaptability of Each

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Type of Mopping	Weight, lbs. per ply of Felt per square	Weight, lbs. of Mopping per square	Weight, lbs. of Slag per square	Weight, lbs. of Gravel per square
			Rec.	Not Rec.							
A	All	Level to 1½ 1½-6	.....	X	Class A	3 Plies Carey Feltex (Asphalt Saturated Rag Felt)	Carey Asphalt	15	140	300	400
B	All	Level to ¾	.....	X	Class A	3 Plies Carey-Seal Tarred Felt (Tar Saturated Rag Felt)	Carey-Seal Tar Pitch	15	175	300	400

DECK SURFACES

Concrete: Before roofing is applied concrete deck must be thoroughly dry and free from frost, loose sand or debris. All low spots or depressions removed to provide satisfactory drainage.

Steel: Before roofing is applied all steel decks must first be covered with a layer of approved roof insulation at least ½ in. thick, said insulation to be bonded to steel deck with hot asphalt.

APPLICATION

TYPE A—Specification No. 4

Three plies of CAREY FELTEX (Asphalt Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 ft., and not less than 140 lbs. CAREY ASPHALT and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 4—Type A.

The Feltex used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be mopped with a heavy coat of Asphalt, into which, while hot, shall be applied three sheets of felt mopped solid between the sheets so that at no point shall felt touch felt, each sheet to overlap the previous sheet 25 ins., leaving 11 ins. exposed. To the top surface of this construction a flood coat of Asphalt shall be poured from a dipper and not less than 50 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Asphalt, while hot, Slag or Gravel shall be embedded. CAREY ASPHALT used in the construction of the roof shall not be heated over 400° F.

Application of Specification 4, Type A Incline of 1½ In. to 6 In. per Foot. (Asphalt Construction Only.)

In applying this specification on a concrete deck having a slope greater than 1½ ins. per foot and not exceeding 6 ins. per foot, wooden nailing strips shall be provided spaced not greater than 3 ft. on centers, if concrete deck will not allow for nailing. Wooden nailing strips, when provided, shall be laid parallel to slope of deck.

All sheets of felt shall be laid at right angles to the slope of deck and each sheet nailed 9 ins. from the back edge with 1-in. roofing nails driven through flat tin caps or 1-in. Simplex Nails, all nails to be spaced on 1-ft. centers.

If wooden nailing strips are provided two nails are to be used at each nailing point, one nail to be 9 ins. from back edge of sheet and one to be 7 ins. from back edge of sheet.

Carey Steep Roofing Asphalt shall be used throughout.

TYPE B—Specification No. 4

Three plies of CAREY-SEAL TARRED FELT (Tar Saturated Rag Felt), each ply weighing approximately 15 lbs. per 100 sq. ft., and not less than 175 lbs. of CAREY-SEAL TAR PITCH and 300 lbs. of Slag or 400 lbs. of Gravel shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 4—Type B.

The CAREY-SEAL TARRED FELT used in the construction of this roof shall be 32 ins. wide. The roof surface shall first be mopped with a heavy coat of Tar Pitch, into which, while hot, shall be applied three layers of CAREY-SEAL TARRED FELT mopped solid between the sheets so that at no point shall felt touch felt, each sheet to overlap the previous sheet 22 ins., leaving 10 ins. exposed. To the top surface of this construction a flood coat of CAREY-SEAL TAR PITCH shall be poured from a dipper and not less than 60 lbs. shall be used to cover 100 sq. ft. of roof surface. Into this top flood coat of Tar Pitch, while hot, Slag or Gravel shall be embedded. CAREY-SEAL TAR PITCH used in the construction of the roof shall not be heated over 400° F.

BOND CLAUSE

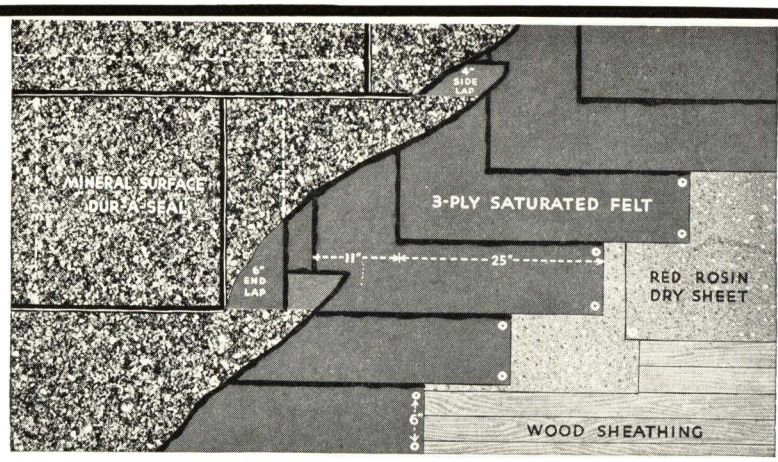
The roofing contractor shall furnish THE PHILIP CAREY MANUFACTURING COMPANY'S 10-year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.

NUMBER

5

Bond: 20-Year

DECK • WOOD or PRECAST GYPSUM
INCLINE • ¾-6 IN. per Foot
CONSTRUCTION • ASPHALT
SURFACE • MINERAL CAP SHEET



Carey 20-Year Master Built-up Roofing Specification No. 5

TYPE "A" • and its Service Adaptability

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes	Underwriters Laboratories Rating	Number of Layers and Type of Felt	Type of Mopping	Weight, lbs. per ply of Felt per square	Weight, lbs. per square Mineral Surfaced Dur-A-Seal	Weight, lbs. per square Asphalt Mopping
A	All	¾ to 6	Not rec.	Class C	3 Plies of Carey Feltex (Asphalt Saturated Rag Felt) 1 Ply Mineral Surfaced Dur-A-Seal (Asphalt Saturated)	Carey Asphalt	15	75	80

DECK SURFACES

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

Gypsum Decks—When this specification is applied over gypsum decks the length of the nails called for under "Application" shall be 1¾ in. long instead of 1 in. long.

APPLICATION

TYPE A—Specification No. 5

One layer of Red Rosin Sized Sheathing Paper, weighing not less than 5 lbs. per square, three layers of 15 lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of Carey Mineral Surfaced Dur-A-Seal (Rag Felt Base), weighing approximately 75 lbs. per 100 sq. ft., and 80 lbs. of Carey Asphalt shall be used in the construction of Carey Master Built-up Roofing Specification No. 5—Type A.

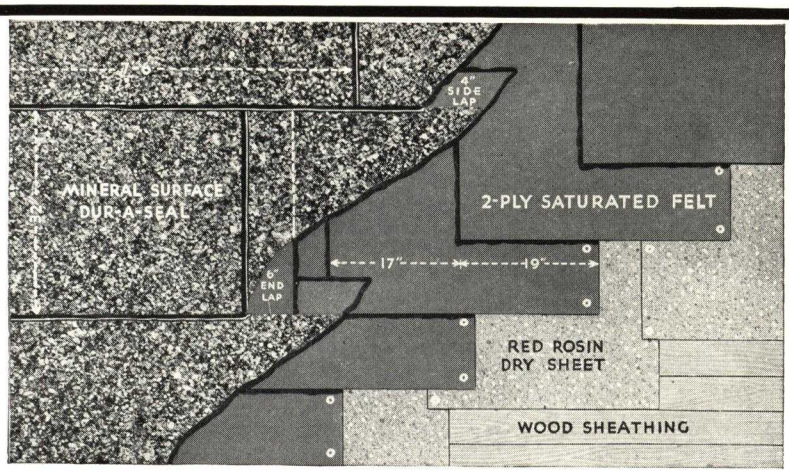
The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with a layer of Red Rosin Sized Sheathing Paper lapped approximately 2 ins. and secured to the deck by occasional nailing. Over this sheet shall then be applied three layers of 15-lb. Feltex, lapping sheets 25 ins., leaving 11 ins. exposed. Sheets shall be mopped solid between the laps with Carey Asphalt and in addition shall be nailed along the edge of the unsecured portion (back nailing method) with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spaced along the laps approximately every 3 ins. To the surface of this three-ply construction a solid mopping of Carey Asphalt shall be applied, into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Rag Felt Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams, laps to be sealed with solid moppings of hot Asphalt. Carey Ashalt used in the construction of this roof shall not be heated over 400° F.

STEEP DECK APPLICATION

When Carey Master Built-up Roofing Specification No. 5 is applied over roof decks having an incline of 1 in. in 12 ins. or greater, the cap or top sheet of Carey Mineral Surfaced Dur-A-Seal shall be back-nailed approximately every 6 ins. along the underside of the end lap, and approximately every 12 ins. along the underside of the side lap with 1-in. "Simplex" nails. The top or cap sheet in these instances should always be run parallel with the pitch of the roof and the sheet at the peak or ridge should extend over the ridge at least 12 ins. and be secured to the deck along the opposite slope with "Simplex" nails driven along the end of the sheet. Asphalt used in the construction of this roof when applied over decks having a pitch exceeding 1 in. in 12 ins. shall be Carey Steep Roofing Asphalt.

BOND CLAUSE

The roofing contractor shall furnish The Philip Carey Manufacturing Company's 20-year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.



Carey 10-Year Master Built-up Roofing Specification No. 6

NUMBER **6**

Bond: 10-Year

DECK • WOOD or PRECAST GYPSUM

INCLINE • ¾-6 IN. per Foot

CONSTRUCTION • ASPHALT

SURFACE • MINERAL CAP SHEET

TYPE "A" • and its Service Adaptability

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Type of Mopping	Weight, lbs. per ply of Felt per square	Weight, lbs. per square Mineral Surf. Dur-A-Seal	Weight, lbs. per square Asphalt Mopping
			Rec.	Not Rec.						
A	All	¾ to 6	.....	X	Class C	2 Plies Carey Feltex (Asphalt Saturated Rag Felt) 1 Ply Mineral Surface Dur-A-Seal (Asphalt Saturated)	Carey Asphalt	15	75	55

DECK SURFACES

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

Gypsum Decks—When this specification is applied over gypsum decks the length of the nails called for under "Application" shall be 1¾ in. long instead of 1 in. long.

APPLICATION

TYPE A—Specification No. 6

One layer of Red Rosin Sized Sheathing Paper, weighing not less than 5 lbs. per square, two layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of Carey Mineral Surfaced Dur-A-Seal (Rag Felt Base) weighing approximately 75 lbs. per 100 sq. ft., and 55 lbs. of Carey Asphalt shall be used in the construction of Carey Master Built-up Roofing Specification No. 6—Type A.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with a layer of Red Rosin Sized Sheathing Paper lapped approximately 2 ins. and secured to the deck by occasional nailing. Over this sheet shall then be applied two layers of 15-lb. Feltex, sheets lapped 19 ins., leaving 17 ins. exposed. Sheets shall be mopped solid between the laps with Carey Asphalt and in addition shall be nailed along the edge of the unsecured portion (back nailing method) with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spaced along the laps approximately every 3 ins. To the surface of this two-ply construction a mopping of Carey Asphalt shall be applied, into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Rag Felt Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams, laps to be sealed with solid moppings of hot Asphalt. Carey Asphalt used in the construction of this roof shall not be heated over 400° F.

STEEP DECK APPLICATION

When Carey Master Built-up Roofing Specification No. 6 is applied over roof decks having an incline of 1 in. in 12 ins. or greater, the cap or top sheet of Carey Mineral Surfaced Dur-A-Seal shall be back nailed approximately every 6 ins., along the underside of the end lap and approximately every 12 ins. along the underside of the side lap with 1-in. "Simplex" nails. The top or cap sheet in these instances should always be run parallel with the pitch of the roof and the sheet at the peak or ridge should extend over the ridge at least 12 ins. and be secured to the deck along the opposite slope with "Simplex" nails driven along the end of the sheet. Asphalt used in the construction of this roof when applied over decks having a pitch exceeding 1 in. in 12 ins. shall be Carey Steep Roofing Asphalt.

BOND CLAUSE

The roofing contractor shall furnish The Philip Carey Manufacturing Company's 10-year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.

NUMBER

7

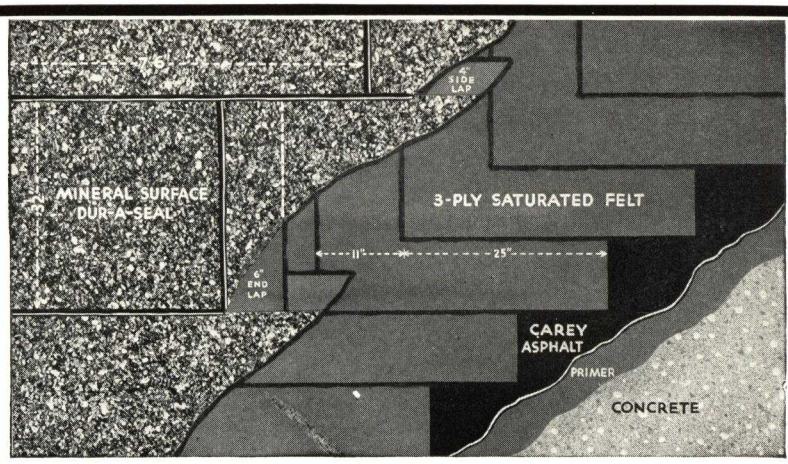
Bond: 20-Year

DECK • CONCRETE STEEL POURED GYPSUM or INSULATED

INCLINE • ¾-1½ IN. per Foot

CONSTRUCTION • ASPHALT

SURFACE • MINERAL CAP SHEET



Carey 20-Year Master Built-up Roofing Specification No. 7

TYPE "A" • and its Service Adaptability

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Type of Mopping	Weight, lbs. per ply of Felt per square	Weight, lbs. per square Mineral Surf. Dur-A-Seal	Weight, lbs. per square Asphalt Mopping
			Rec.	Not Rec.						
A	All	¾ to 1½	.....	X	Class C	3 Plies Carey Feltex (Asphalt Saturated Rag Felt) 1 Ply Mineral Surf. Dur-A-Seal (Asphalt Saturated)	Carey Asphalt	15	75	120

DECK SURFACES

Before Built-up Roofing is applied concrete or gypsum decks must be thoroughly dry with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof decks shall be free from frost, loose sand or debris and surface of deck shall also be free from laitance and scaling as the result of frozen mix.

Steel—Before roofing is applied all steel decks must first be covered with a layer of approved roof insulation at least ½ in. thick, said insulation to be bonded to steel deck with hot asphalt.

APPLICATION

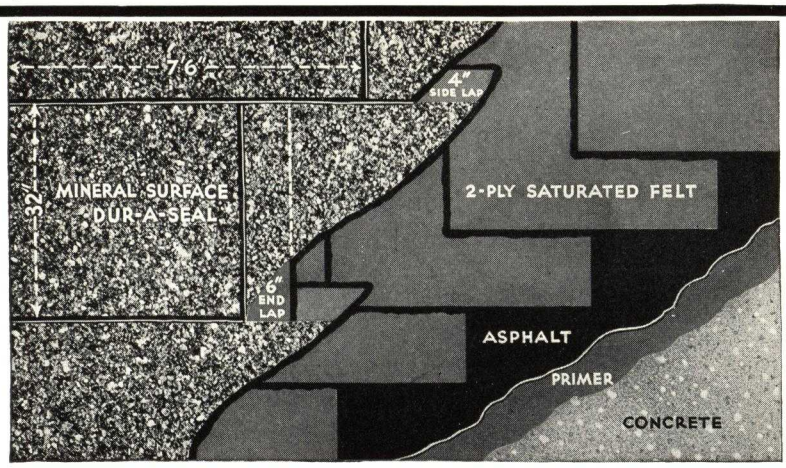
TYPE A—Specification No. 7

One gallon of Asphalt Primer, three layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of Carey Mineral Surfaced Dur-A-Seal (Rag Felt Base), weighing approximately 75 lbs. per 100 sq. ft., and 120 lbs. of Carey Asphalt shall be used in the construction of Carey Master Built-up Roofing Specification No. 7—Type A.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a solid mopping of Asphalt into which, while hot, shall be embedded three layers of 15-lb. Feltex, lapping sheets 25 ins., leaving 11 ins. exposed. Sheets shall be mopped solid between the plies with Carey Asphalt. The surface of this three-ply construction shall then be mopped with a solid mopping of Carey Asphalt into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Rag Felt Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams. Laps to be sealed with solid moppings of Asphalt. The Asphalt used in the construction of this roof shall not be heated over 400° F.

BOND CLAUSE

The roofing contractor shall furnish The Philip Carey Manufacturing Company's 20-year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.



Carey 10-Year Master Built-up Roofing Specification No. 8

NUMBER 8

Bond: 10-Year

DECK • CONCRETE STEEL POURED GYPSUM or INSULATED
INCLINE • ¾-1½ IN. per Foot
CONSTRUCTION • ASPHALT
SURFACE • MINERAL CAP SHEET

TYPE "A" • and its Service Adaptability

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Type of Mopping	Weight, lbs. per ply of Felt per square	Weight, lbs. per square Mineral Surf. Dur-A-Seal	Weight, lbs. per square Asphalt Mopping
			Rec.	Not Rec.						
A	All	¾ to 1½	.....	X	Class C	2 Plies Carey Feltex (Asphalt Saturated Rag Felt) 1 Ply Mineral Surface Dur-A-Seal (Asphalt Saturated)	Carey Asphalt	15	75	95

DECK SURFACES

Before Built-up Roofing is applied concrete or gypsum decks must be thoroughly dry with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof decks shall be free from frost, loose sand or debris and surface of deck shall also be free from laitance and scaling as the result of frozen mix.

Steel—Before roofing is applied all steel decks must first be covered with a layer of approved roof insulation at least ½ in. thick, said insulation to be bonded to steel deck with hot asphalt.

APPLICATION

TYPE A—Specification No. 8

One gallon of Asphalt Primer, two layers of 15-lb. Feltex (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and one sheet of Carey Mineral Surfaced Dur-A-Seal (Rag Felt Base), weighing approximately 75 lbs. per 100 sq. ft., and 95 lbs. of Carey Asphalt shall be used in the construction of Carey Master Built-up Roofing Specification No. 8—Type A.

The Dur-A-Seal Cap Sheet and Felt used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a solid mopping of Asphalt into which, while hot, shall be embedded two layers of 15-lb. Feltex, lapping sheets 19 ins., leaving 17 ins. exposed. Sheets shall be mopped solid between the plies with Carey Asphalt. The surface of this two-ply construction shall then be mopped with a solid mopping of Carey Asphalt into which, while hot, shall be embedded the sheet of Mineral Surfaced Dur-A-Seal (Rag Felt Base), sheets to be applied in approximately 8-ft. lengths and lapped 4 ins. along the longitudinal seams and 6 ins. at the end seams. Laps to be sealed with solid moppings of Asphalt. The Asphalt used in the construction of this roof shall not be heated over 400° F.

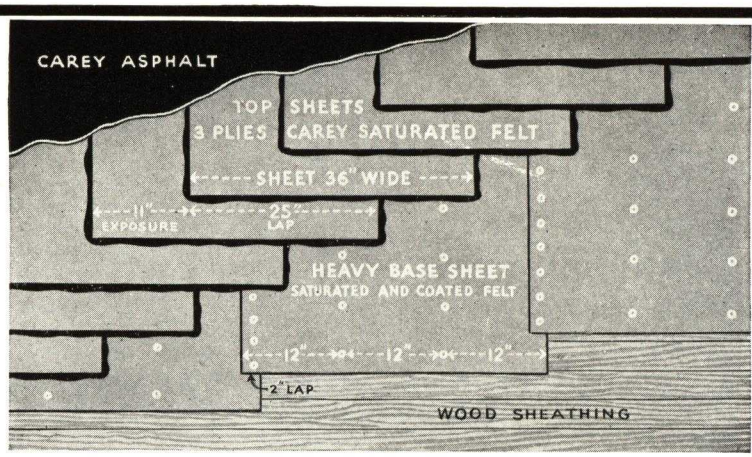
BOND CLAUSE

The roofing contractor shall furnish The Philip Carey Manufacturing Company's 10-year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.

NUMBER

9

Bond: 20-Year



Carey 20-Year Master Built-up Roofing Specification No. 9

DECK • WOOD or PRECAST GYPSUM
INCLINE • ¾-6 IN. per Foot
CONSTRUCTION • ASPHALT
SURFACE • ASPHALT

TWO OPTIONAL TYPES • and the Service Adaptability of Each

TYPE	Section of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Weight, lbs. per ply Base Sheet	Weight, lbs. per ply Cap Sheets per sq.	Type Mopping	Weight per square Asphalt Mopping
			Rec.	Not Rec.						
A	All	¾ to 6	X	.....	Class A	1 Layer Carey Fiberock Base Sheet (Asphalt Impregnated Asb.) 3 plies Carey Fiberock	60	20	Carey Asphalt	100
C	All	¾ to 6	X	.....	Class C	1 Layer Feltex Base Sheet (Asphalt Sat. Rag Felt) 3 plies Fiberock (Asphalt Sat. Asbestos Felt)	45	20	Carey Asphalt	100

DECK SURFACES

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris, and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

Gypsum Decks—When this specification is applied over Gypsum Decks, nails called for under "Application," shall be 1¾ ins. long instead of 1 in. long.

APPLICATION

TYPE A—Specification No. 9

One layer of CAREY FIBEROCK ASBESTOS BASE SHEET (Asphalt Impregnated and Coated Asbestos Felt) weighing approximately 60 lbs. per 100 sq. ft., and three plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt) each sheet weighing approximately 20 lbs. per 100 sq. ft., and 100 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 9—Type A.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 60-lb. Fiberock Base Sheet, lapping all sheets not less than 2 ins. and secured to the deck with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps approximately every 4 ins. In addition two rows of nails shall be run parallel to the laps through the center of the sheets, nailing approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded three sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap previous sheet 25 ins., leaving 11 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

TYPE C—Specification No. 9

One layer of CAREY FELTEX BASE SHEET (Asphalt Saturated and Coated Rag Felt), weighing approximately 45 lbs. per 100 sq. ft., and three plies of 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on One Side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and 100 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 9—Type C.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 45-lb. Feltex Base Sheet, mopping this sheet not less than 2 ins. and securing it to the deck with 1-in nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps, approximately every 4 ins. In addition, two rows of nails shall be run parallel to the laps through the center of the sheet, nailing approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided, a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded three sheets of 20-lb. Fiberock, each sheet to overlap the previous sheet 25 ins., leaving 11 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

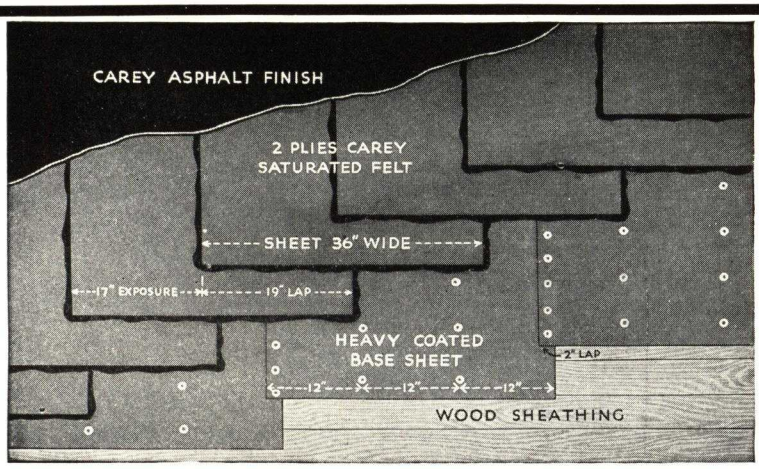
STEEP DECK APPLICATION

In applying either of the above specifications on deck having slope exceeding 2 ins. per foot, all sheets shall be run at right angles to slope of deck and nailed at a point 2 ins. from the back edge of each sheet, spacing nails on 8-in. centers.

Carey Steep Roofing Asphalt shall be used throughout.

BOND CLAUSE

The roofing contractor shall furnish THE PHILIP CAREY MANUFACTURING COMPANY'S 20-year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.



Carey 10-Year Master Built-up Roofing Specification No. 10

NUMBER **10**

Bond: 10-Year

DECK • WOOD or PRECAST GYPSUM

INCLINE • ¾-6 IN. per Foot

CONSTRUCTION • ASPHALT

SURFACE • ASPHALT

THREE OPTIONAL TYPES • and the Service Adaptability of Each

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Weight, lbs. Base Sheet per square	Weight, lbs. per ply Cap Sheet per square	Type Mopping	Weight per square Asphalt Mopping
			Rec.	Not Rec.						
A	All	¾ to 6	X	.....	Class A	1 layer Carey Fiberock Base Sheet (Asphalt Impregnated Asb.) 2 plies Carey Fiberock (Asphalt Impregnated Asb.)	45	20	Carey Asphalt	75
B	North and East	¾ to 6	.....	X	Class C	1 layer Feltex Base Sheet (Asphalt Sat. Rag Felt) 2 plies Carey Feltex (Asphalt Sat. Rag Felt)	30	15	Carey Asphalt	75
C	North and East	¾ to 6	X	.....	Class C	1 layer Feltex Base Sheet (Asphalt Sat. Rag Felt) 2 plies Carey Fiberock (Asphalt Impregnated Asb.)	30	20	Carey Asphalt	75

DECK SURFACES

The roof deck over which this specification is to be applied shall be dry, free from rubbish and debris and free from objectionable low spots and depressions. Roof must be applied during dry, favorable weather.

GYPSUM DECKS

When this specification is applied over gypsum decks the length of the nails called for under "Application," shall be 1¾ ins. long instead of 1 in. long.

APPLICATION

TYPE A—Specification No. 10

One layer of Carey 45-lb. Fiberock Asbestos Base Sheet (Asphalt Impregnated and Coated Asbestos Felt), weighing approximately 45 lbs. per 108 sq. ft., and two plies of Carey 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and 75 lbs. of Carey Asphalt shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 10—Type A.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 45-lb. Fiberock Base Sheet, lapping all sheets not less than 2 ins. and secured to the deck with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps approximately every 4 ins. In addition two rows of nails shall be run parallel to the laps through the center of the sheets, nailing approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided a solid mopping of Carey Asphalt shall be applied, into which, while hot, shall be embedded two sheets of Carey 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot Carey Asphalt. Carey Asphalt used in the construction of this roof shall not be heated over 400° F.

TYPE B—Specification No. 10

One layer of CAREY 30-LB. FELTEX BASE SHEET (Asphalt Saturated Rag Felt), weighing approximately 30 lbs. per 100 sq. ft., and two plies of CAREY 15-LB. FELTEX (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and 75 lbs. CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 10—Type B.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 30-lb. Feltex Base Sheet, lapping all sheets not less than 2 ins. and secured to the deck with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps approximately every 4 ins. In addition two rows of nails shall be run parallel to the laps through the center of the sheets, nailing approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded two sheets of 15-lb. Feltex, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

TYPE C—Specification No. 10

One layer of CAREY 30-LB. FELTEX BASE SHEET (Asphalt Saturated Rag Felt), weighing approximately 30 lbs. per 100 sq. ft., and two plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated one side with Asphalt), each sheet weighing approximately 20 lbs. per sq. ft., and 75 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 10—Type C.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be covered with the 30-lb. Feltex Base Sheet, lapping all sheets not less than 2 ins. and secured to the deck with 1-in. nails driven through flat tin caps or 1-in. "Simplex" nails, spacing nails along the laps approximately every 4 ins. In addition two rows of nails shall be run parallel to the laps through the center of the sheets, nailed approximately 8 ins. apart and 12 ins. from either edge. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied, into which, while hot, shall be embedded two sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of hot CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

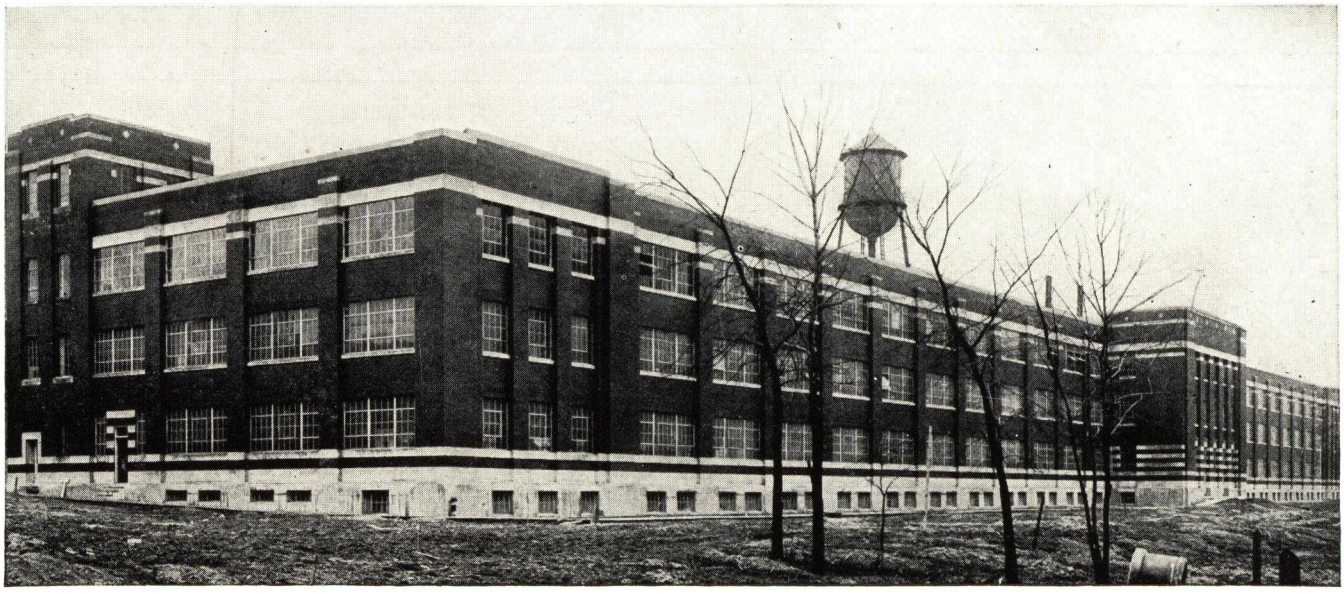
STEEP DECK APPLICATION

In applying any of the above specifications on deck having slope exceeding 2 ins. per foot, all sheets shall be run at right angles to slope of deck and nailed at a point 2 ins. from the back edge of each sheet, spacing nails on 8-in. centers.

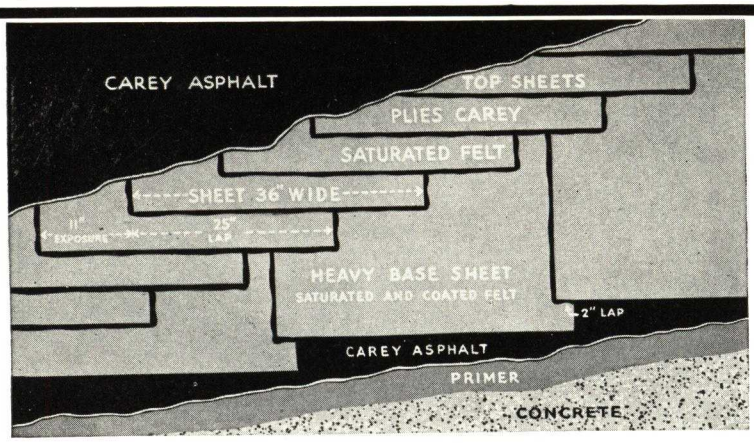
Carey Steep Roofing Asphalt shall be used throughout.

BOND CLAUSE

The roofing contractor shall furnish THE PHILIP CAREY MANUFACTURING COMPANY'S 10-Year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.



The DeVilbiss Manufacturing Company — Toledo, Ohio



Carey 20-Year Master Built-up Roofing Specification No. 11

NUMBER **11**

Bond: 20-Year

DECK • CONCRETE STEEL POURED GYPSUM or INSULATED
INCLINE • ¾-1½ IN. per Foot
CONSTRUCTION • ASPHALT
SURFACE • ASPHALT

TWO OPTIONAL TYPES • and the Service Adaptability of Each

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Weight, lbs. Base Sheet per square	Weight, lbs. per ply Cap Sheets per square	Type Mopping	Weight per square Asphalt Mopping	Asphalt Primer
			Rec.	Not Rec.							
A	All	¾ to 1½	X	.....	Class A	1 layer Carey Fiberock Base Sheet (Asphalt Impregnated Asb.) 2 plies Carey Fiberock (Asphalt Impregnated Asb.)	60	20	Carey Asphalt	115	1 Gal.
C	All	¾ to 1½	.....	X	Class A	4 plies Carey Fiberock (Asphalt Impregnated Asb. Felt)	.....	20	Carey Asphalt	140	1 Gal.

DECK SURFACES

Before Built-up Roofing is applied concrete or gypsum decks must be thoroughly dry with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof decks shall be free from frost, loose sand or debris and surface of decks shall also be free from laitance and scaling as the result of frozen mix.

Steel—Before roofing is applied all steel decks must first be covered with a layer of approved roof insulation at least ½ in. thick, said insulation to be bonded to steel deck with hot asphalt.

APPLICATION

TYPE A—Specification No. 11

One gallon Asphalt Primer, a base sheet of Carey Fiberock (Asphalt Impregnated and Coated Asbestos Felt), weighing approximately 60 lbs. per 100 sq. ft., two plies of Carey 20-lb. Fiberock (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and 110 lbs. of Carey Asphalt shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 11—Type A.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a heavy coat of Asphalt into which, while hot, shall be laid the Carey 60-lb. Fiberock Base Sheet, lapping all sheets not less than 2 ins. To the surface thus provided a solid mopping of Carey Asphalt shall be applied into which, while hot, shall be embedded two sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap the previous sheet 19 ins., leaving 17 in. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of Carey Asphalt. Carey Asphalt used in the construction of this roof shall not be heated over 400° F.

TYPE C—Specification No. 11

One gallon Asphalt Primer, and four plies Carey 20-lb. Fiberock Asbestos Felt Impregnated and coated on one side with Asphalt, each sheet weighing approximately 20 lbs. per 100 sq. ft. and 140 lbs. Carey Asphalt shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 11—Type C.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a heavy coat of asphalt into which, while hot, shall be embedded four sheets of felt, each sheet to overlap the previous sheet 27 ins., leaving 9 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of Carey Asphalt. Carey Asphalt used in constructing this roof shall not be heated over 400° F.

BOND CLAUSE

The roofing contractor shall furnish The Philip Carey Manufacturing Company's 20-Year Surety Bond covering both material and workmanship used in the construction of this roof, when same is applied strictly according to above specifications by a Carey Approved Roofer.

NUMBER

12

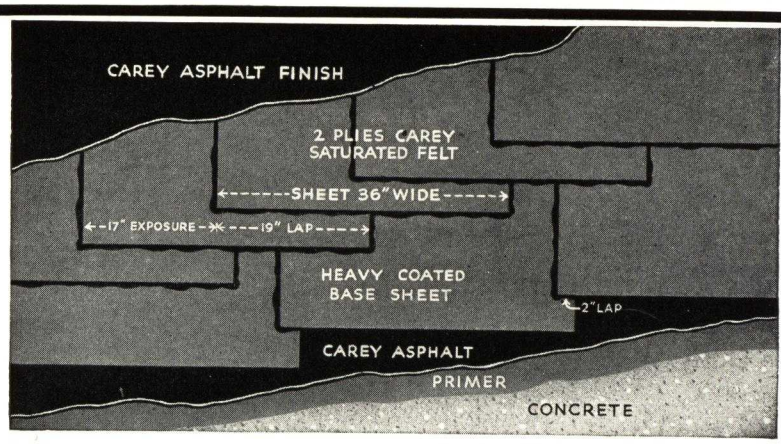
Bond: 10-Year

DECK • CONCRETE, STEEL, POURED GYPSUM or INSULATED

INCLINE • ¾-1½ IN. per Foot

CONSTRUCTION • ASPHALT

SURFACE • ASPHALT



Carey 10-Year Master Built-up Roofing Specifications No. 12

THREE OPTIONAL TYPES • and the Service Adaptability of Each

TYPE	Sections of U. S.	Deck Slope, inches to one foot	Acid Fumes		Underwriters Laboratories Rating	Number of Layers and Type of Felt	Weight, lbs. Base Sheet per square	Weight, lbs. per ply Cap Sheet per square	Type Mopping	Weight per square Asphalt Mopping	Asphalt Primer
			Rec.	Not Rec.							
A	All	¾ to 1½	X	.....	Class A	1 layer Carey Fiberock Base Sheet (Asphalt Impregnated Asb.) 2 plies Carey Fiberock (Asphalt Impregnated Asb.)	45	20	Carey Asphalt	115	1 Gal.
B	North and East	¾ to 1½	.....	X	Class C	1 layer Carey Feltex Base Sheet (Asphalt Sat. Rag Felt) 2 plies Carey Feltex (Asphalt Sat. Rag Felt)	30	15	Carey Asphalt	115	1 Gal.
C	North and East	¾ to 1½	X	.....	Class C	1 layer Carey Feltex Base Sheet (Asphalt Sat. Rag Felt) 2 plies Carey Fiberock (Asphalt Impregnated Asb.)	30	20	Carey Asphalt	115	1 Gal.

DECK SURFACES

Before Built-up Roofing is applied concrete or gypsum decks must be thoroughly dry with all low spots or depressions removed so that satisfactory drainage to outlets will result. Roof decks shall be free from frost, loose sand or debris and surface of deck shall also be free from laitance and scaling as the result of frozen mix.

Steel—Before roofing is applied all steel decks must first be covered with a layer of approved roof insulation at least ½ in. thick, said insulation to be bonded to steel deck with hot asphalt.

APPLICATION

TYPE A—Specification No. 12

One gallon Asphalt Primer, a base sheet of CAREY 45-LB. FIBEROCK (Asphalt Impregnated and Coated Asbestos Felt), weighing approximately 45 lbs. per 108 sq. ft., two plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and 115 lbs. of CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 12—Type A.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a heavy coat of Asphalt into which, while hot, shall be laid the CAREY 45-LB. FIBEROCK BASE SHEET, lapping all sheets not less than 2 ins. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded two sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of CAREY ASPHALT. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

TYPE B—Specification No. 12

One gallon Asphalt Primer, a base sheet of CAREY FELTEX (Asphalt Saturated Rag Felt), weighing approximately 30 lbs. per 100 sq. ft., and two plies of CAREY 15-LB. FELTEX (Asphalt Saturated Rag Felt), each sheet weighing approximately 15 lbs. per 100 sq. ft., and 115 lbs. CAREY ASPHALT shall be used in constructing 100 sq. ft. of Carey Master Built-up Roofing Specification No. 12—Type B.

All felts used in the construction of this roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer to which surface shall be applied a heavy coat of Asphalt into which, while hot, shall be laid the CAREY 30-LB. FELTEX Base Sheet, lapping all sheets not less than 2 ins. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded two sheets of felt, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of CAREY ASPHALT. CAREY ASPHALT used in constructing this roof shall not be heated over 400° F.

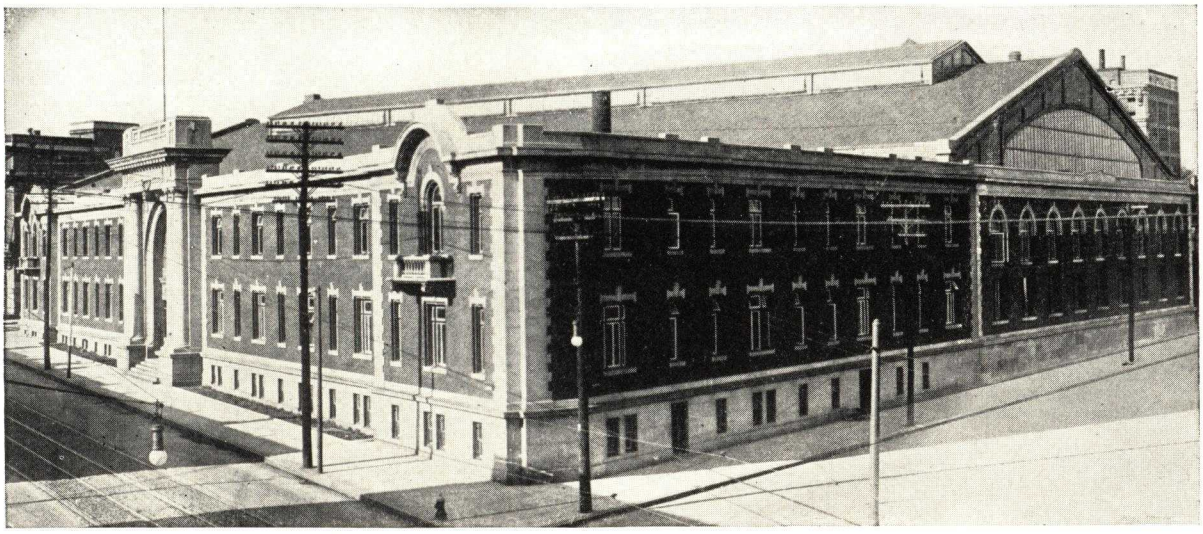
TYPE C—Specification No. 12

One gallon of Asphalt Primer, a base sheet of CAREY FELTEX (Asphalt Saturated Rag Felt), weighing approximately 30 lbs. per 100 sq. ft., and two plies of CAREY 20-LB. FIBEROCK (Asbestos Felt Impregnated and Coated on one side with Asphalt), each sheet weighing approximately 20 lbs. per 100 sq. ft., and 115 lbs. of CAREY ASPHALT shall be used in the construction of 100 sq. ft. of Carey Master Built-up Roofing Specification No. 12—Type C.

All felts used in the construction of the roof shall be 36 ins. wide. The roof surface shall first be primed with Asphalt Primer, to which surface shall be applied a heavy coat of Asphalt into which, while hot, shall be embedded the CAREY 30-LB. FELTEX Base Sheet, lapping all sheets not less than 2 ins. To the surface thus provided a solid mopping of CAREY ASPHALT shall be applied into which, while hot, shall be embedded two sheets of 20-lb. Fiberock, Asphalt coated side down, each sheet to overlap the previous sheet 19 ins., leaving 17 ins. exposed. Solid moppings of Asphalt shall be applied between the sheets so that at no point shall felt touch felt. The roof surface shall be finished with a uniform coating of Asphalt. CAREY ASPHALT used in the construction of this roof shall not be heated over 400° F.

BOND CLAUSE

The roofing contractor shall furnish THE PHILIP CAREY MANUFACTURING COMPANY'S 10-Year Surety Bond covering both material and workmanship used in the construction of this roof, where same is applied strictly according to above specifications by a Carey Approved Roofer.



Armory Drill Shed, 33rd and Lancaster Ave. Philadelphia, Pa.

ROOF INSULATION

For Application Over Wood, Concrete and Steel Decks

The following Carey Master Built-up Roofing Specifications are especially adapted for application over insulated wood, concrete and steel decks (asphalt primer called for in roofing specifications to be omitted unless called for in the insulation specification):

(1) 20-year Slag or Gravel surfaced: All types called for under Carey Master Built-up Roofing Specification No. 3.

(2) 10-year Slag or Gravel surfaced: All types called for under Carey Master Built-up Roofing Specification No. 4.

(3) 20-year Dur-A-Seal Mineral Surfaced: All types called for under Carey Master Built-up Roofing Specification No. 7.

(4) 10-year Dur-A-Seal Mineral Surfaced: All types called for under Carey Master Built-up Roofing Specification No. 8.

(5) 20-year smooth Asphalt finished: All types called for under Carey Master Built-up Roofing Specification No. 11.

(6) 10-year smooth Asphalt finished: All types called for under Carey Master Built-up Roofing Specification No. 12.

GENERAL REQUIREMENTS

When smooth top Asphalt finished roofs, Dur-A-Seal Mineral surfaced roofs or any other type roof not surfaced with Slag or Gravel, is specified for application over insulated poured or pre-cast concrete decks, the deck shall be primed with a coat of cold Asphalt Primer, using approximately one gallon per 100 sq. ft., before the first mopping of Asphalt, which is to bond the insulation in place, is applied.

Bitumen required for application of roof insulation shall be in addition to the total quantity specified for use in applying the built-up roofing specification.

The roof deck shall be acceptable to the roofing contractor and shall be thoroughly clean, dry and otherwise conform to the accepted standard of deck construction providing a suitable surface over which to apply a built-up roof.

At the end of each day's work the exposed edges of the insulation shall be protected from the elements with a strip of 15-lb. Saturated Felt bonded to the deck and extended over exposed edges of insulation with a mopping of hot Bitumen.

The application of the built-up roof shall follow closely the application of the insulation and at no time shall the built-up roof be applied when the surface of the insulation is moist or damp.

SPECIAL CONSTRUCTION RECOMMENDATIONS

The constructions recommended in this note, while not a part of this insulation specification, are suggested for use on jobs where improved construction is desired at small additional cost.

(A) Concrete Decks—A mopping of hot Bitumen and a layer of 15-lb. Saturated Felt applied to the deck before insulation is applied provides a better base and a dryer bonding surface for the insulation than otherwise would be provided if insulation was applied directly over the concrete.

(B) Water Stops—When insulation is applied to all types of decks it may be divided into sections by means of water stops or seal courses consisting of strips of 15-lb. Saturated Felt approximately 10½ ins. wide. One half the width of a Saturated Felt strip is bonded to the deck with hot Bitumen, the other half is extended over the edges and on to the surface of the insulation and secured to same with a mopping of hot Bitumen.

These water stops or seal courses should be placed at intervals of approximately 30 feet in both directions and at all outside edges of insulation, thereby preventing the danger of water from possible leaks traveling from one section of the insulation to another.

SPECIFICATION FOR INSULATED WOOD DECKS

The wood deck shall first be covered with two layers of Red Rosin Sized Sheathing Paper weighing approximately 5 lbs. per 100 sq. ft. Sheets shall be lapped approximately 19 ins. at the side and end laps and secured to the deck by occasional nailing. Over this surface a layer of approved insulation shall be applied strictly according to architect's or manufacturer's specifications and secured to the deck with large headed roofing nails. (If additional layers of roof insulation are specified, joints between each subsequent layer shall be broken and layers of insulation shall be bonded together and firmly embedded into a solid mopping of hot Bitumen.) Over the surface of the applied insulation the built-up roof, type as specified, shall be applied.

All Bitumen used in applying insulation shall be of the same type as is used in the construction of the built-up roof.

SPECIFICATION FOR INSULATED CONCRETE DECKS

The concrete deck shall first be covered with a solid mopping of hot Bitumen. (When Asphalt roofs are specified which are not to be surfaced with Slag or Gravel the deck shall be primed before the mopping of hot Asphalt is applied.) Into the solid mopping of Bitumen, while hot, shall be firmly embedded a layer of approved roof insulation applied strictly according to architect's or manufacturer's specifications. (If additional layers of roof insulation are specified, joints between each subsequent layer shall be broken and layers of insulation shall be bonded together and firmly embedded into a solid mopping of hot Bitumen.) Over the surface of the applied insulation the built-up roof, type as specified, shall be applied.

All Bitumen used in applying insulation shall be of the same type as is used in the construction of the built-up roof.

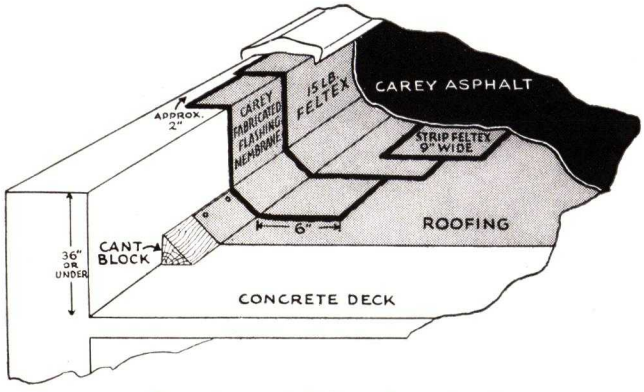
SPECIFICATION FOR INSULATED STEEL DECKS

Sections of the steel deck formed in sheets shall provide rigidity and strength and not be subject to excessive deflection. Steel deck shall be free from perforations which will allow hot Bitumen to drip through the deck and shall be free from bolt heads, purlin clips and insulation cleats and other objectionable projections. Deck and fixtures shall have a shop coat of paint. Roofing specifications constructed of Coal Tar Pitch are not recommended for application over steel deck construction.

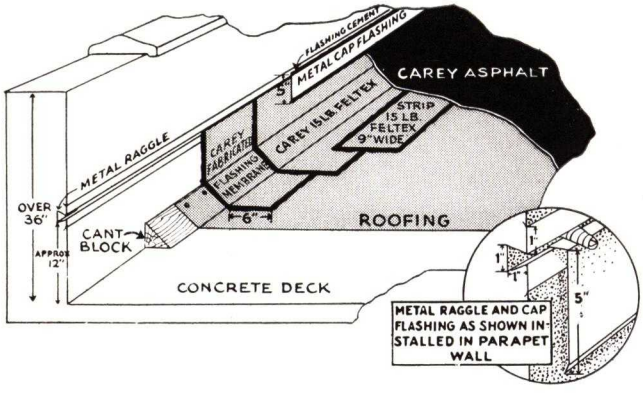
The steel deck shall first be covered with a solid mopping of Asphalt into which, while hot, shall be firmly embedded a layer of approved roof insulation applied strictly according to architect's or manufacturer's specifications. On roof decks having an incline exceeding ¾ in. in 12 ins. insulation shall be secured in place with metal clips or bolts in addition to the bond provided by the Asphalt. (If additional layers of roof insulation are specified, joints between each subsequent layer shall be broken and layers of insulation shall be bonded together and firmly embedded into a solid mopping of hot Asphalt.)

All Asphalt used in the application of insulation for bonding roofing to the surface of the insulation, when applied over steel deck, shall have a minimum melting point of 190° F. Over the surface of the applied insulation the built-up roof, type as specified, shall be applied.

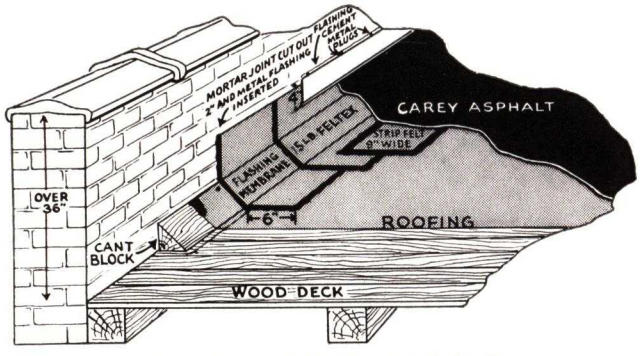
CAREY BONDED FLASHING DETAILS • 10-Year



Carey Approved Flashing Detail No. 1
Recommended for use on brick or concrete parapet walls not exceeding 36 in. in height, on which coping is to be applied



Carey Approved Flashing Detail No. 2
Recommended for use on concrete parapet walls exceeding 36 in. in height



Carey Approved Flashing Detail No. 3
Recommended for use on brick parapet walls exceeding 36 in. in height

The three flashing details shown at the left are adaptable to new or replacement work and may be modified to meet almost any unusual condition. The methods of installation are clearly indicated. The text below describes the materials used in the flashing and the laying of the sheets over the wood cant strip.

Carey Fabricated Flashing Membrane

A two-ply preformed Fabricated Flashing Membrane consisting of laminations of Waterproofed Cotton Fabric and Feltex, bonded together at the factory with an especially blended and refined asphalt.

Weight of sheet per 100 sq. ft. . . . . Approx. 32 lbs.
Stretch before fracture. . . . . Approx. 10%
Mullen test for tensile strength
against felt side of Membrane. . . Approx. 190 lbs.

On account of the elasticity, stretch, strength and extreme flexibility of this material it will conform readily and bond securely with hot asphalt to parapet walls, angles and corners, thus tending to eliminate all danger of cracks and breaks found in ordinary flashing material as the result of misuse, movement in the roof deck or settling of the building.

Wood Cant Strip

Wood cant strip shall be constructed out of a diagonal half of a 4x4 which shall be placed securely in the angle of the wall and cemented in place with a mopping of hot asphalt on hard surfaced decks or toe nailed at the lower edge of the cant strip on wood decks.

The heavy base sheet and all top sheets of the built-up roof shall extend to the top edge of the wood cant strip and be secured in place with nails driven through flat tin caps, after which a 12-in. strip of Carey Fabricated Flashing Membrane shall be laid parallel with the cant strip extending 3 ins. up on the vertical side of the parapet wall and approximately 3½ ins. out on the roof and secured in place with a mopping of hot asphalt.

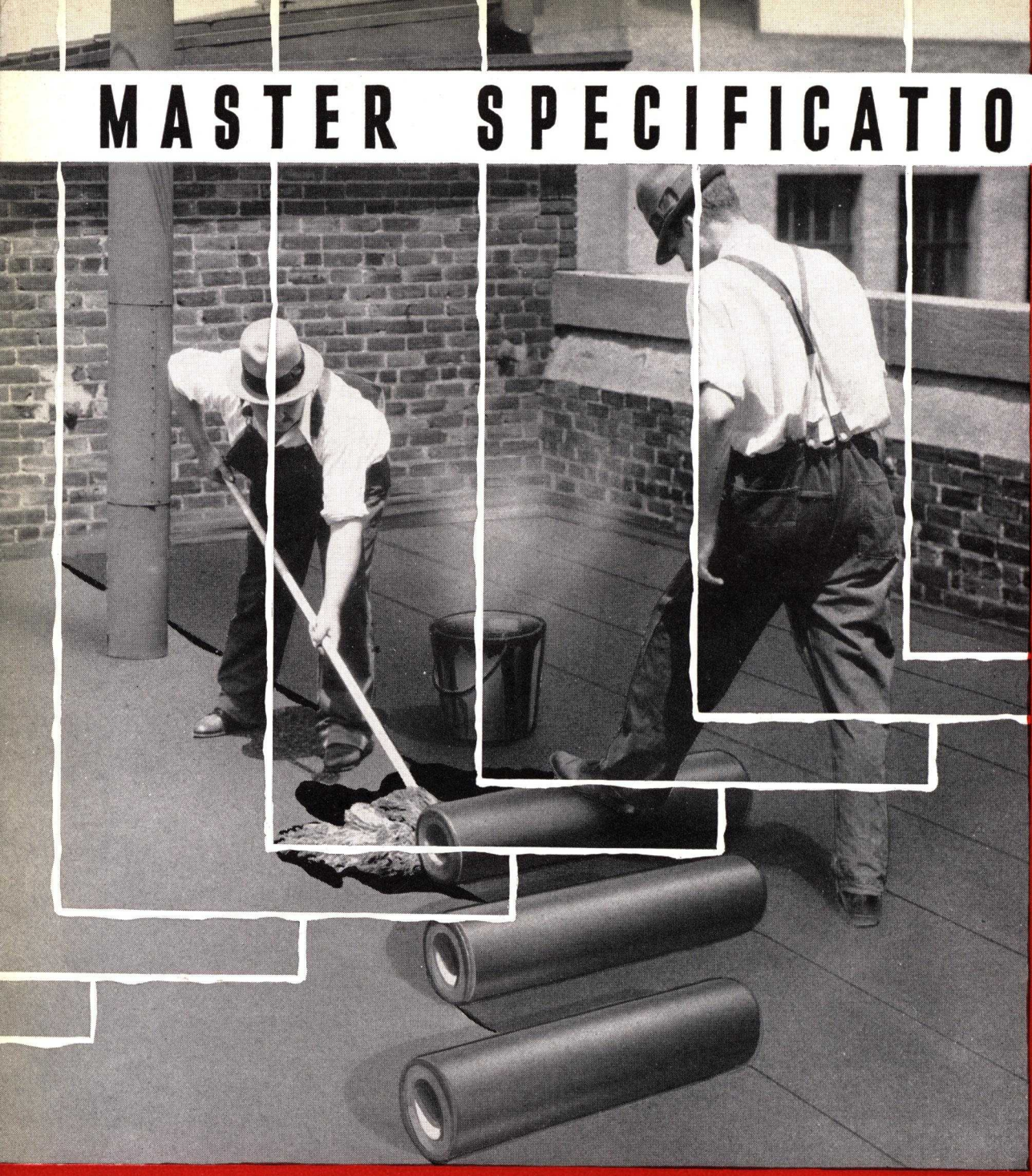
The rest of the flashing construction shall be installed in accordance with Carey Approved Flashing Details Nos. (1) (2) (3).

Alternate—Plastic Flashings

As an alternate construction it will be satisfactory to substitute Carey Flashing Cement in place of hot Asphalt as the bonding material on the above Flashing constructions.

On those details where metal Counter Flashings are specified, if Carey Flashing Cement is used as the bonding material, it will be satisfactory to use as a Counter Flashing over the top edge of the base Flashing a four inch wide strip of saturated cotton fabric laid in Carey Flashing Cement and trowel coated with same material.

MASTER SPECIFICATIONS



Carey BUILT-UP ROOFS

BONDED 5·10·20 YEARS

CELOTEX

REG. U.S. PAT. OFF.

BUILDING PRODUCTS

ROOFING PRODUCTS *Section*

« *See* INSULATION *and* ACOUSTICAL *Sections* »

SPECIFICATION CHART FOR CELOTEX BONDED BUILT-UP ROOFS †

PERIOD OF BOND IN YEARS	SPECIFICATION DESIGNATION	LIMITATIONS OF ROOF INCLINE IN INCHES PER FOOT	SURFACE FINISH	CONSTRUCTION: Number of Plies of Felt	MATERIAL WEIGHT: Layers of Bitumen	Primer	Sheathing Paper	Base Sheet	Asphalt Felt	Tarred Felt	19/UP Construction	Cap Sheet	Asphalt	Pitch	Gravel	Slag	WEIGHT PER SQUARE: Smooth	Mineral Surfaced	Gravel Surfaced	Slag Surfaced	Underwriters' Classification	PAGE NUMBER
SPECIFICATIONS FOR WOOD OR PRECAST GYPSUM DECKS																						
20	**WA-20G**	¼ up to 3	Gravel or slag	One 30-lb. felt (asphalt) Three 15-lb. felts (asphalt)	4			32	49				140		400	300			621	521	A	4
20	**WP-20G**	¼ up to 2	Gravel or slag	Five 15-lb. felts (tar) One sheathing paper	4		5			81				150	400	300			636	536	A	4
15	**WA-15G**	¼ up to 3	Gravel or slag	One 30-lb. felt (asphalt) Two 15-lb. felts (asphalt)	3			32	32				110		400	300			574	474	A	4
15	**WP-15G**	¼ up to 2	Gravel or slag	Four 15-lb. felts (tar) One sheathing paper	3		5			65				125	400	300			595	495	A	4
15	**WA-15NU**	3 up to 12	Mineral	Three 15-lb. felts (asphalt) 19/UP Construction	4				49		110		120					279			C	4
10**	**WA-10G**	3 up to 6	Gravel or slag	Five 15-lb. felts (asphalt)	5				81				125		325	250			531	456	C	4
10	**WA-10CS**	¾ up to 3	Cap sheet	One 32-lb. base sheet Two 15-lb. felts One 34-lb. cap sheet	3			32	32			34	90				191				C	5
10	**WA-10NU**	3 up to 12	Mineral	Two 15-lb. felts (asphalt) 19/UP Construction	2				32		110		60					202			C	5
SPECIFICATIONS FOR NON-COMBUSTIBLE DECKS																						
20	**CA-20G**	¼ up to 3	Gravel or slag	Four 15-lb. felts (asphalt)	5	9			65				180		400	300			654	554	A	5
20	**CP-20G**	¼ up to 2	Gravel or slag	Four 15-lb. felts (tar)	5					65				200	400	300			665	565	A	5
15	**CA-15G**	¼ up to 3	Gravel or slag	Three 15-lb. felts (asphalt)	4	9			49				150		400	300			608	508	A	5
15	**CP-15G**	¼ up to 2	Gravel or slag	Three 15-lb. felts (tar)	4					49				175	400	300			624	524	A	5
15	**CA-15NU**	3 up to 9	Mineral	Two 15-lb. felts (asphalt) 19/UP Construction	4	9			32		110		120					271			C	6
10**	**CA-10G**	3 up to 6	Slag or gravel	Four 15-lb. felts (asphalt)	5	9			65				125		325	250			624	449	C	6
10	**CA-10CS**	¾ up to 3	Cap Sheet	Three 15-lb. felts One 34-lb. cap sheet	4	9			49			34	120				212				C	6
10	**CA-10NU**	3 up to 9	Mineral	One 15-lb. felt (asphalt) 19/UP Construction	3	9			15		110		90					224			C	6
SPECIFICATIONS FOR OVER CONCRETE AND UNDER PROMENADE TILE																						
10	**CA-10T**	Up to 1	Tile	Five 15-lb. felts (asphalt)	6	9			81				180				270					6
10	**CP-10T**	Up to 1	Tile	Five 15-lb. felts (tar)	6					81				200			281					6

**Write The Celotex Corporation for Special Specifications should 20 year bond be required.

Specifications for non combustible decks may also be used over steel decks having ½ in. roof insulation, or over rigid roof insulation, provided nailing strips are used on inclines over 3 in. to the foot.

Note: Specifications for use in the eleven western states are different from above, and can be obtained from offices of Celotex Corporation. No bonds are issued in Pacific Coast area. Slag or gravel surfaced roofs are recommended for use in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma, as we will not bond smooth surfaced asphalt roofs in that area. †Subject to change without notice.

Specifications for Celotex Traffic Top, "The Resilient Promenade Surfacing." **Note:** Celotex Traffic Top is applied only by our Approved Distributors. Specifications are available on request.

THE CELOTEX CORPORATION

• 919 • NORTH • MICHIGAN • AVENUE • CHICAGO • ILLINOIS •

Foreword

EXPERIENCE—Over the years involved in building up the preeminence of Celotex Cane Fibre Products in the structural insulation field, roofing, waterproofing, dampproofing, and vaporproofing problems have been presented in many forms by various branches of the building industry for solution. Engineering Research and Construction Service Departments of the Celotex Corporation cooperated with the building industry generally in solving such problems, and in this work, Celotex has developed many standards that have been put into general practice, and has also produced new products in this field which have found immediate acceptance by architects, engineers, owners, general contractors, and roofers as valuable refinements and developments of good roofing practices.

ENGINEERING SERVICES BY ROOFING ENGINEERS—The Celotex Corporation is prepared to furnish definite recommendation as to the correct type of roof to be used with any type of construction. Any special problem may be referred to them with assurance of cooperation.

BOND FOR BUILT-UP ROOF AND FLASHINGS—If a Celotex Bond is required, the roof shall be inspected by an authorized Celotex inspector. Such bonds will be given only when the roof is laid by a Celotex approved Built-up Roofer in strict accordance with specifications.

Celotex Standard Flashing Specifications used in conjunction with a bonded roof specification will carry a flashing endorsement for a period of years corresponding to the type of flashing used.

TYPES AND FINISHES OF BUILT-UP ROOFS—Celotex specifications have been made complete by incorporating the following types of built-up roofing construction, each for a specified term of years:

(1) Smooth Surfaced Asphalt Roofs, **(2)** Gravel or Slag Surfaced Asphalt Roofs, **(3)** Crushed Slate Surfaced Asphalt Roofs, **(4)** Coal Tar Felt and Pitch Roofs.

All of the above roofs will be bonded if desired.

ABBREVIATED ROOFING DESIGNATIONS—In the table on page 2 and the Built-up Roofing Specification on pages 4, 5, and 6 the following letters and numbers apply. The first letter indicates the type of deck—W for wood, C for concrete or other non-combustible materials; the second letter indicates the bitumen—A for asphalt, P for pitch; the number denotes the period of bond; the last letter indicates the type of surface—G for gravel, NU for 19/UP, CS for cap sheet, T for tile.

Index

	Page
Celotex Built-up Roofing Specification	4, 5, 6
Celotex Roof Insulation Specification	7, 8, 9
Celotex Protection Board	10
Celotex Traffic Top	11

CELOTEX ROOFING PRODUCTS

ASPHALT SHINGLES

Celotex Shad-O-Grain Shingles
Celotex Three-Tab Edgseal Shingles
Celotex Three-Tab Jumbo Shingles
Celotex Thick-Butt Shingles
Celotex Ver-Style Shingles
Celotex Cut-Out Shingles
Celotex Standard Hexagonal Shingles
Celotex Hexagonal Slab Shingles
Celotex Double Coverage Hexagonal Shingles
Celotex Lok-Lay Shingles
Celotex Hex-Lox Shingles
Celotex Self-Spacing Individual Shingles
Celotex Hip and Ridge Shingles
Celotex Dutch Lap Shingles

ASPHALT SIDINGS

Celotex Brik-face Edgseal Siding
Celotex Brik-face Edgseal Corners
Celotex Soldier Course Brik-face Edgseal Siding
Celotex Brik-face Thick-Butt Siding
Celotex Brik-face Thick-Butt Corners
Celotex Brik-face Starter Strips
Celotex Four Point Hex Siding

MINERAL SURFACED ROLL ROOFINGS

Celotex (Mineral Rolls)
Celotex 19/UP Roofing
Celotex Blockedge
Celotex Diamond Point
Celotex Starter and Valley Strips

SMOOTH SURFACED ROLL ROOFINGS

Celotex Super-Grade
Celotex (Regular)
Servall
Solar
Celotex Coated Sheathing Felt
Celotex Cap Sheet Roofing
Celotex Black and White Cap Sheet Roofing

FELTS, BUILDING PAPERS, ETC.

Celotex Tarred Felt
Celotex Asphalt Felt
Celotex Slaters Felt
Celotex Asphalt Sheathing Paper
Celotex Tarred Sheathing Paper
Celotex Threaded Felt
Celotex Insulating Paper
Celotex Deadening Felt
Celotex Sheathing Papers—Red or Gray
Celotex Sheathing Paper—Blue
Celotex Blue Plasterboard

ROOF COATINGS AND CEMENTS

Celotex Asphalt Roof Coating—Black
Solar Asphalt Roof Coating—Black
Celotex Asbestos Roof Coating—Black
Solar Asbestos Roof Coating—Black
Celotex 19/UP Cement
Celotex Lap Cement
Celotex Plastic Cement—Black
Solar Plastic Cement—Black
Celotex Refined Tar
Celotex Super Lap Cement
Celotex Pitch Black Paint
Celotex Asphalt Primer

See Back Cover for List of Branch Sales Offices

CELOTEX BUILT-UP ROOFING

OVER WOOD OR PRECAST GYPSUM DECKS

SPECIFICATION WA-20G

TYPE—Slag or Gravel Surface Celotex Asphalt Saturated Felts, Asphalt.

DECK—Wood (or precast gypsum).

INCLINE—¼ in. up to 3 in. per foot.

CLASSIFICATION—Underwriters' "A."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification WA-20G applied as follows and subject to the Celotex detailed specification and requirements. Apply a Celotex 30-lb. Asphalt Saturated Felt (or two layers of 15-lb. Celotex Asphalt Saturated Felt lapped 19 in.) laid dry and nailed. Over this base apply three layers of 15-lb. Celotex Asphalt Saturated Felt in shingle construction lapped 24¾ in. and solidly cemented to base sheet, and between plies with Celotex Roofing Asphalt. Coat surface with a heavy pouring of Celotex Roofing Asphalt and embed 400 lbs. of gravel or 300 lbs. of slag per square.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 20 years.

SPECIFICATION WP-20G

TYPE—Slag or Gravel Surface Celotex Tarred Felts, Celotex Coal Tar Pitch.

DECK—Wood (or precast gypsum).

INCLINE—¼ in. up to 2 in. per foot.

CLASSIFICATION—Underwriters' "A."

INSERT UNDER "ROOFING"—Built-up Roofing shall be Celotex Specification WP-20G applied as follows and subject to Celotex detailed specification and requirements. Apply one layer of sheathing paper and over this apply two layers of Celotex 15-lb. Tarred Felt laid dry in shingle construction, lapped 17 in. and nailed. Over these dry felts apply three additional layers of Celotex 15-lb. Tarred Felts in shingle construction, lapped 22 in. and solidly cemented between and to the underlying felt with Celotex Roofing Pitch. Coat surface with a heavy pouring of Celotex Roofing Pitch and embed 400 lbs. of gravel or 300 lbs. of slag.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 20 years.

SPECIFICATION WA-15G

TYPE—Slag or Gravel Surface Celotex Asphalt Saturated Felts, Asphalt.

DECK—Wood (or precast gypsum).

INCLINE—¼ in. up to 3 in. per foot.

CLASSIFICATION—Underwriters' "A."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification WA-15G applied as follows and subject to the Celotex detailed specification and requirements. Apply a Celotex 30-lb. Asphalt Saturated Base Felt (or two layers of Celotex 15-lb. Asphalt Saturated Felt, lapped 19 in.) laid dry and nailed. Over this base apply two layers of Celotex 15-lb. Asphalt Saturated Felt in shingle construction, lapped 19 in., and solidly cemented to base sheet and between plies with Celotex Roofing Asphalt. Coat surface with a heavy pouring of Celotex Roofing Asphalt and embed 400 lbs. of gravel or 300 lbs. of slag per square.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 15 years.

SPECIFICATION WP-15G

TYPE—Slag or Gravel Surface Celotex Tarred Felts, Celotex Coal Tar Pitch.

DECK—Wood (or precast gypsum).

INCLINE—¼ in. up to 2 in. per foot.

CLASSIFICATION—Underwriters' "A."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification WP-15G applied as follows and subject to the Celotex detailed specification and requirements. Apply one layer of sheathing paper and over this apply two layers of Celotex 15-lb. Tarred Felts laid dry in shingle construction, lapped 17 in. and nailed. Over these dry felts apply two additional layers of Celotex 15-lb. Tarred Felts in shingle construction, lapped 17 in., and solidly cemented between and to the underlying felt with Celotex Roofing Pitch. Coat surface with a heavy pouring of Celotex Roofing Pitch and embed 400 lbs. of gravel or 300 lbs. of slag per square.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 15 years.

SPECIFICATION WA-15NU

TYPE—Mineral Surface Celotex 19/UP Construction Asphalt Saturated Felts, Celotex Roofing Asphalt or 19/UP cement.

DECK—Wood (or precast gypsum).

INCLINE—3 in. up to 12 in. per foot.

CLASSIFICATION—Underwriters' "C."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification WA-15NU applied as follows and subject to the Celotex detailed specification and requirements. Apply one layer of Celotex 15-lb. Asphalt Saturated Felt laid dry and nailed. Over this felt apply two additional layers of Celotex 15-lb. Asphalt Saturated Felt lapped 19 in. and cemented solidly to the first felt and to each other with Celotex Roofing Asphalt or 19/UP. Over these felts apply Celotex 19/UP Roofing in two layers solidly cemented to each other and to the underlying felt with Celotex Roofing Asphalt or 19/UP cement.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 15 years.

SPECIFICATION WA-10G

TYPE—Slag or Gravel Surface Celotex Asphalt Saturated Felts, Celotex Roofing Asphalt.

DECK—Wood (or precast gypsum).

INCLINE—3 in. up to 6 in. per foot.

CLASSIFICATION—Underwriters' "C."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification WA-10G applied as follows and subject to the Celotex detailed specification and requirements. Apply five layers of Celotex 15-lb. Asphalt Saturated Felts in shingle construction, lapped 29¼ in., nailed as specified and cemented solidly between laps for a distance of 25 in. with Celotex Roofing Asphalt. Coat surface with a heavy pouring of Celotex Roofing Asphalt and embed 325 lbs. of gravel or 250 lbs. of slag per square.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 10 years.

NOTE: *A similar type of specification is available for a 20 year bond period.*

OVER WOOD OR PRECAST GYPSUM DECKS — CONTINUED

SPECIFICATION WA-10CS

TYPE—Smooth Surface 34-lb. Celotex Cap Sheet, Celotex Asphalt Saturated Felts, Celotex Roofing Asphalt.

DECK—Wood (or precast gypsum).

INCLINE—¾ in. up to 3 in. per foot.

CLASSIFICATION—Underwriters' "C."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification WA-10CS applied as follows and subject to the Celotex detailed specification and requirements. Apply one layer of Celotex 34-lb. base sheet laid dry and nailed. Over this felt apply two layers of Celotex 15-lb. Asphalt Saturated Felt, lapped 19 in. and solidly cemented together to the underlying felt with Celotex Roofing Asphalt. Over these felts apply one layer of Celotex 34-lb. Cap Sheet, lapped 6 in., and solidly cemented with Celotex Roofing Asphalt.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 10 years.

NOTE: *Bond on this specification not issued in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma.*

SPECIFICATION WA-10NU

TYPE—Mineral Surfaced Celotex 19/UP Construction, Celotex Asphalt Saturated Felts, Celotex Roofing Asphalt, 19/UP Cement.

DECK—Wood (or precast gypsum).

INCLINE—3 in. up to 12 in. per foot.

CLASSIFICATION—Underwriters' "C."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification WA-10NU applied as follows, subject to the Celotex detailed specification and requirements. Apply two layers of Celotex 15-lb. Asphalt Saturated Felt laid dry, lapped 19 in. and nailed. Over these felts apply Celotex 19/UP Roofing in two layers solidly cemented between and to the underlying felt with Celotex Roofing Asphalt or 19/UP cement.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 10 years.

CELOTEX BUILT-UP ROOFING
OVER NON-COMBUSTIBLE DECKS

SPECIFICATION CA-20G

TYPE—Slag or Gravel Surface Celotex Asphalt Saturated Felts, Asphalt.

DECK—Non-combustible (poured or precast concrete, poured gypsum or book tile).

INCLINE—From ¼ in. up to 3 in. per foot, (wood nailing strips on 4 ft. centers required on inclines over 2 in. per foot unless deck allows nailing).

CLASSIFICATION—Underwriters' "A."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification CA-20G applied as follows and subject to the Celotex detailed specification and requirements. (Prime gypsum decks with Celotex Asphalt Primer) then mop all decks with Celotex Roofing Asphalt. Apply four layers of Celotex 15-lb. Asphalt Saturated Felt laid in shingle construction, lapped 27½ in. and solidly cemented with Celotex Roofing Asphalt. Coat surface with heavy pouring of Celotex Roofing Asphalt and embed 400 lbs. of gravel or 300 lbs. of slag per square.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 20 years.

SPECIFICATION CA-15G

TYPE—Slag or Gravel Surface Celotex Asphalt Saturated Felts, Asphalt.

DECK—Non-combustible (poured or precast concrete, poured gypsum or book tile).

INCLINE—From ¼ in. up to 3 in. per foot (wood nailing strips on 4-ft. centers required on inclines over 2 in. per foot unless deck allows nailing).

CLASSIFICATION—Underwriters' "A."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification CA-15G laid as follows and subject to the Celotex detailed specification and requirements. (Prime gypsum decks with Celotex Asphalt Primer) then mop all decks with Celotex Roofing Asphalt. Apply three layers of Celotex 15-lb. Asphalt Saturated Felts in shingle construction, lapped 24¾ in. and solidly cemented with Celotex Roofing Asphalt. Coat surface with heavy pouring of Celotex Roofing Asphalt and embed 400 lbs. of gravel or 300 lbs. of slag per square.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 15 years.

SPECIFICATION CP-20G

TYPE—Slag or Gravel Surface Celotex Tarred Felts, Celotex Coal Tar Pitch.

DECK—Non-combustible (poured or precast concrete, poured gypsum or book tile).

INCLINE—From ¼ in. up to 1 in. per foot on poured or precast concrete or book tile; from ¼ in. up to 2 in. per foot on poured gypsum.

CLASSIFICATION—Underwriters' "A."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification CP-20G applied as follows and subject to the Celotex detailed specification and requirements. Apply four layers of Celotex 15-lb. Tarred Felts in shingle construction, lapped 24½ in. and solidly cemented with Celotex Roofing Pitch. Coat surface with heavy pouring of Celotex Roofing Pitch and embed 400 lbs. of gravel or 300 lbs. of slag per square.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 20 years.

SPECIFICATION CP-15G

TYPE—Slag or Gravel Surfaced Celotex Tarred Felts, Celotex Coal Tar Pitch.

DECK—Non-combustible (poured or precast concrete, poured gypsum or book tile).

INCLINE—From ¼ in. up to 1 in. per foot on poured or precast concrete or book tile; from ¼ in. up to 2 in. per foot on poured gypsum.

CLASSIFICATION—Underwriters' "A."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification CP-15G laid as follows and subject to the Celotex detailed specification and requirements. Apply three layers of Celotex 15-lb. Tarred Felts in shingle construction, lapped 22 in. and solidly cemented with Celotex Roofing Pitch. Coat surface with heavy pouring of Celotex Roofing Pitch and embed 400 lbs. of gravel or 300 lbs. of slag per square.

FLASHING—Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 15 years.

OVER NON-COMBUSTIBLE DECKS — CONTINUED

SPECIFICATION CA-15NU

TYPE—Mineral Surfaced Celotex 19/UP Construction Asphalt Saturated Felts, Celotex Roofing Asphalt or 19/UP Cement.

DECK—Non-combustible (poured concrete or poured gypsum).

INCLINE—3 in. up to 9 in. per foot (on inclines over 4 in. to the foot, provisions should be made for nailing).

CLASSIFICATION—Underwriters' "C."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification CA-15NU laid as follows and subject to the Celotex detailed specification and requirements. (Prime gypsum decks with Celotex Asphalt Primer) then coat decks with Celotex Roofing Asphalt. Apply two layers of Celotex 15-lb. Asphalt Saturated Felt lapped 19 in., and solidly cemented in Celotex Roofing Asphalt or 19/UP Cement. Over these felts apply Celotex 19/UP Roofing in two layers, solidly cemented between and to each other with Celotex Roofing Asphalt or 19/UP cement.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 15 years.

SPECIFICATION CA-10CS

TYPE—Smooth Surface 34-lb. Celotex Cap Sheet, Celotex Asphalt Saturated Felts, Celotex Roofing Asphalt.

DECK—Non-combustible (poured concrete or poured gypsum).

INCLINE—¾ in. up to 3 in. per foot (wood nailing strips on 4 ft. centers required on inclines over 2 in. per foot unless surface of deck allows nailing).

CLASSIFICATION—Underwriters' "C."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification CA-10CS applied as follows and subject to the Celotex detailed specification and requirements. (Prime gypsum decks with Celotex Asphalt Primer) then mop all decks with Celotex Roofing Asphalt. Apply three layers of Celotex 15-lb. Asphalt Saturated Felts, lapped 24¾ in. and solidly cemented with Celotex Roofing Asphalt. Over these felts apply one layer of Celotex 34-lb. Cap Sheet, lapped 6 in., and solidly cemented with Celotex Roofing Asphalt.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 10 years.

NOTE: *Bond on this specification not issued in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma.*

SPECIFICATION CA-10G

TYPE—Slag or Gravel Surface Celotex Asphalt Saturated Felts, Celotex Roofing Asphalt.

DECK—Non-combustible.

INCLINE—3 in. up to 6 in. per foot (provision to be made for nailing).

CLASSIFICATION—Underwriters' "C."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification CA-10G laid as follows, subject to the Celotex detailed specification and requirements. (Prime gypsum decks with Celotex Asphalt Primer) then mop all decks with Celotex Roofing Asphalt and apply four layers of Celotex 15-lb. Asphalt Saturated Felt, lapped 27½ in. solidly cemented with Celotex Roofing Asphalt. Coat surface with a heavy pouring of Celotex Roofing Asphalt and embed with 325 lbs. of gravel or 250 lbs. of slag per square.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 10 years.

NOTE: *A similar type of specification is available for 20 year bond.*

SPECIFICATION CA-10NU

TYPE—Mineral Surfaced Celotex 19/UP Construction Celotex Asphalt Saturated Felts, Celotex Roofing Asphalt or 19/UP Cement.

DECK—Non-combustible (poured concrete or poured gypsum).

INCLINE—3 in. up to 9 in. per foot (on inclines over 4 in. to the foot, provision should be made for nailing).

CLASSIFICATION—Underwriters' "C."

INSERT UNDER "ROOFING"—Built-up roofing shall be Celotex Specification CA-10NU laid as follows and subject to the Celotex detailed specification and requirements. (Prime gypsum decks with Celotex Asphalt Primer) then mop all decks with Celotex Roofing Asphalt. Apply one layer of Celotex 15-lb. Asphalt Saturated Felt, solidly cemented with Celotex Roofing Asphalt or 19/UP Cement. Over this Felt apply Celotex 19/UP Roofing in two layers, solidly cemented between and to the underlying felt with Celotex Roofing Asphalt or 19/UP Cement.

FLASHING—A Celotex standard flashing shall be used.

BOND—A bond covering performance of roofing shall be furnished for a period of 10 years.

CELOTEX BUILT-UP ROOFING
OVER CONCRETE AND UNDER PROMENADE TILE

SPECIFICATION CA-10T

TYPE—Celotex Asphalt Saturated Felts and Celotex Roofing Asphalt.

DECK—Concrete.

INCLINE—Not over 1 in. per foot.

INSERT UNDER "ROOFING"—Built-up roofing under Promenade Tile shall be a Celotex Specification CA-10T applied as follows and subject to the Celotex detailed specification and requirements. Apply five layers of Celotex 15-lb. Asphalt Saturated Felts in two, two and one ply construction, solidly cemented to the deck and between the sheets with Celotex Roofing Asphalt and surfaced with a heavy coating of Celotex Roofing Asphalt.

FLASHING—Special Celotex Flashing for Tile Decks shall be installed in accordance with specifications and requirements of The Celotex Corporation.

BOND—A bond covering performance of roofing shall be furnished for a period of 10 years.

SPECIFICATION CP-10T

TYPE—Celotex Tarred Felts and Celotex Coal Tar Pitch.

DECK—Concrete.

INCLINE—Not over 1 in. per foot.

INSERT UNDER "ROOFING"—Built-up roofing under Promenade Tile shall be Celotex Specification CP-10T applied as follows and subject to the Celotex detailed specification and requirements. Apply five layers of Celotex 15-lb. Tarred Felt in two, two and one ply construction, solidly cemented with Celotex Roofing Pitch and surfaced with a heavy coating of Celotex Roofing Pitch.

FLASHING—Special Celotex Flashing for Tile Decks shall be installed in accordance with specifications and requirements of The Celotex Corporation.

BOND—A bond covering performance of roofing shall be furnished for a period of 10 years.

GENERAL INFORMATION AND SUGGESTIONS

CELOTEX ROOF INSULATION

FOR PHYSICAL CHARACTERISTICS OF FIBRE INSULATION INCLUDING CELOTEX ROOF INSULATION, SEE CELOTEX INSULATION CATALOG

Celotex brand Roof Insulation is a cane fibre product Roof Insulation especially designed for the insulation of roofs under built-up roofing, slate or tile roofs. It provides a highly desirable surface for mopping with asphalt or pitch. The firm support provided for the roof covering by Celotex Roof Insulation guards the finished roof surface from damage by mechanical abrasion or traffic.

In order to obtain the best results, the following supplementary directions covering work to be done by contractors other than the roofer should be considered in preparing the architect's specifications.

SHEET METAL WORK

Roof insulation warrants the installation of the very best type of flashing construction. It is important that insulation be protected from the elements.

Where skylight curbs, monitor curbs, saw-tooth curbs or the like are to be flashed, it is important that a condensation drip pan flashing of metal be provided under the sill of the sash frame, in order to expel any moisture that may form on the back of the glass, thus protecting the roofing and the underlying layers of insulation.

Where hanging gutters are used the gutter should be furnished in a complete unit provided with roof flange, gravel stop (if roof surface is of gravel or slag), and the entire girth of the gutter formed in one continuous sheet of metal, properly hung with roof brackets.

At all exposed eaves metal eave strips must be extended down over the edges of the roof boarding and securely fastened in place and provided with a drip that will expel all the drainage water.

All types of vents, outlets, drains, scuppers and the like, should be properly flashed and installed in a substantial, workmanlike manner.

Where large or heavy ventilators or standpipes or louvres are installed, they should be securely anchored to the underlying roof deck and should not depend for fastening upon the insulation.

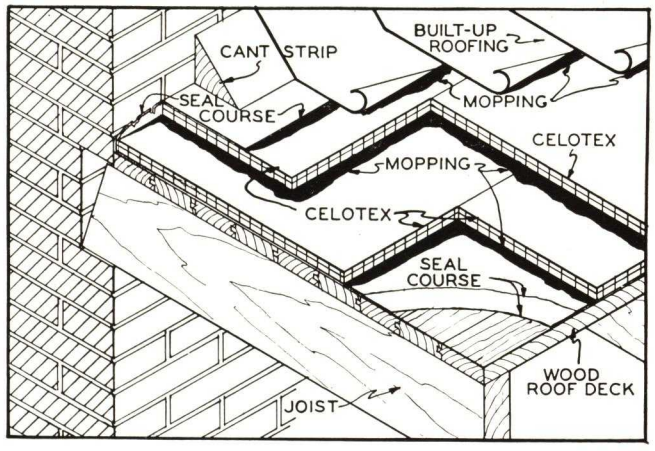
WOOD NAILING STRIPS

Where sheet metal flashing aprons and flanges of any nature are used, it will be found of advantage to apply a wood nailing strip the full thickness of the insulation, and 1 in. wider than the aprons to serve as a nailing base for such aprons and flanges. This nailing strip should be rigidly secured to the roof deck with nails, lag bolts, expansion bolts, or similar means of attachment.

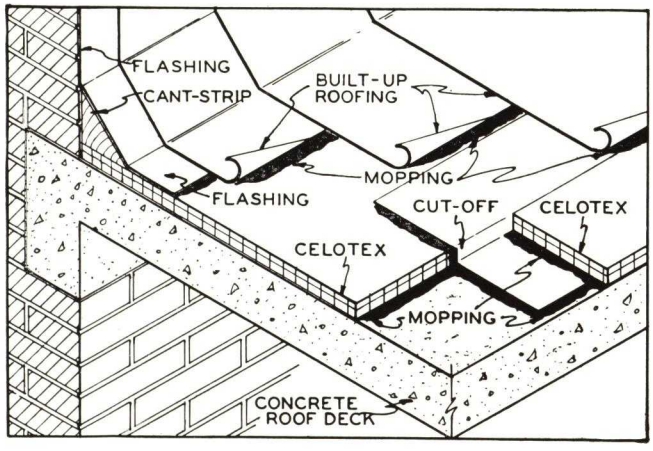
SLATE AND TILE WORK

Celotex Roof Insulation constitutes an ideal medium for the insulation of slate and tile roofs.

Application of Celotex Roof Insulation can be handled satisfactorily by the slate and tile contractor. Care should be exercised, however, in application of both slate and tile to fasten joints securely to underlying roof deck.



The word Celotex in the drawings above and below indicates Celotex brand Roof Insulation Board



CONCRETE WORK

Where a roof deck is of concrete, it is important that the roof be uniformly graded and that the surface be finished smooth and level and free from depressions. The concrete should be dry before the insulation layer is applied.

CANT STRIPS

Wherever cant strips are provided along the wall line, the Celotex Roof Insulation should first be installed over the roof deck surface and the cant strips applied over the Celotex Roof Insulation layers.

This also applies on sawtooth curbs, monitor curbs, and the like, where cant pieces are installed.

IMPROVED APPLICATION SUGGESTIONS

Under conditions of unusual severity, and as an added point of quality in roof insulation work, the following suggestions are advanced:

SEAL COURSE—A seal course consisting of one layer of 14-lb. saturated felt, lapped 2 in. and mopped to the deck (or mopped over rosin sized sheathing nailed to wood deck), prior to the application of the Roof Insulation, permits sealing in of the roof shortly after the roof deck is completed, thus protecting the interior of the building from the weather.

By sealing the roof at this time, it is not necessary that the contractor immediately proceed with laying of the insulation and roofing, hence the roofing contractor may select weather most favorable to roofing work, and may be the last trade to work upon the roof, thereby preventing possible damage to the roofing from other trades.

VAPOR CUT-OFF—When high humidities prevail under wood roof decks or steel decks, it is essential that a **vapor-proofing course** be applied over the decks prior to the application of the insulation. This course is heavier than the seal course mentioned above, and is described in detail under section of the Roof Insulation Specifications following.

WATER CUT-OFF—Water cut-offs consist of strips of saturated roofing felt 8 to 10 in. wide, stuck in bitumen to the roof, carried over the edge of the insulation, and stuck to the top surface of the insulation. By installing these water cut-offs approximately 24 in. from and parallel to all vertical walls, such as parapets, pent-houses, skylight curbs, etc., and by dividing the balance of the roof area into rectangular areas approximately 30 ft. on a side, each such area of insulation is thus isolated from adjoining areas. This protection is particularly suggested where high humidities are constantly maintained beneath the deck.

SPECIFICATIONS—INSULATING FLAT ROOFS

CELOTEX ROOF INSULATION UNDER BUILT-UP ROOFING

NOTE: *Notes are explanatory or advisory only and should not be included in the specifications.*

NOTE: *Select and include only those clauses which apply to the particular work. Words in bracketed bold face type are selective.*

(1) INSULATING MATERIAL

Insulation shall be **[specify]** thick Ferox Treated Celotex Roof Insulation laid in **[one] [two]** layer **[s]**. Boards shall be 22 inches wide x 47 inches long. Celotex shall be kept dry before, during, and after application.

NOTE: *Offset edges are optional in 1 inch and greater thicknesses.*

The following roof areas shall be insulated:

NOTE: *List and locate. If more than one thickness of insulation is required on various roof areas, list and locate each separately.*

(2) GENERAL

All Celotex Fibre Insulation Products shall be kept dry before, during, and after application. Only as much Celotex shall be laid over roof area as can be covered by finished roofing in any one day. Lay Celotex Roof Insulation in **[one] [two]** layer **[s]** over entire roof area. Adjoining edges of boards shall be brought to a moderate contact but shall not be forced into place. Where the roof meets vertical surfaces, such as parapets, penthouses, etc., boards shall be cut in a neat, workmanlike manner to insure proper joining without forcing. Boards shall be laid in parallel courses with end joints in each course breaking with those of adjoining courses.

Where insulation is laid in two (2) layers, the boards of the second layer shall be laid parallel with those of the first layer, and the joints of the second layer shall break with those of the first layer.

APPLICATION A—OVER WOOD ROOF DECKS

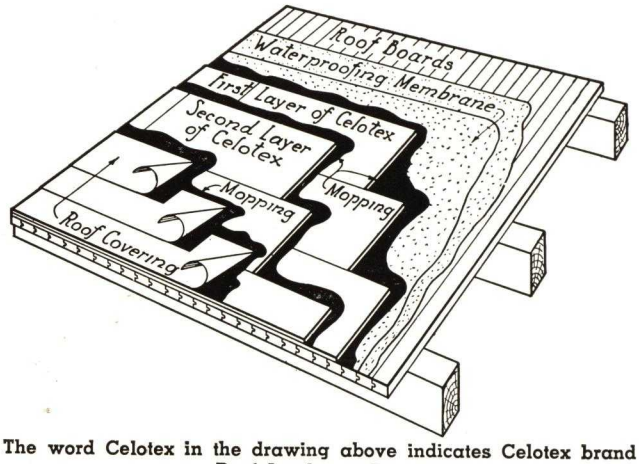
NOTE: *This specification applies to insulation against heat loss and to protect against top story excessive summer heat. Where high humidities are maintained, use Application B.*

(3) ROOF DECK

The surface of the roof deck shall be broomed clean, free from dirt, loose material, and thoroughly dry. All loose or springy boards shall be properly nailed before insulation is laid.

(4) BUILDING PAPER

NOTE: *Use this clause in case the insulation is laid in one layer.*



The word Celotex in the drawing above indicates Celotex brand Roof Insulation Board

The entire roof area shall be covered with two (2) plies (lapped half) rosin sized building paper or coated felt. Nail sufficiently to hold in place until the insulation is laid over it.

(5) APPLICATION

(5a) NAILS—Nails shall be of sufficient length to pass through the insulation and penetrate the wood roof deck at least ¾ inch.

(5b) NAILING — Space nails 12 inches apart. Each board shall be secured in place by nailing along each edge and staggered along the longitudinal center line.

Nailing of two (2) layer insulation shall be through the second or top layer only.

APPLICATION B—OVER WOOD ROOF DECKS WHERE HIGH HUMIDITIES ARE MAINTAINED

NOTE: *This specification applies where high humidities are maintained and prevention of condensation is necessary. Where this condition does not exist, use Application A.*

(6) ROOF DECK

The surface of the roof deck shall be broomed clean, free from dirt, loose material, and throughly dry. All loose or springy boards shall be properly nailed before insulation is laid.

(7) VAPOR CUT-OFF

NOTE: *Include over entire roof area in conjunction with roof insulation on wood roof decks over rooms carrying high manufactured or incidental humidities. Select one of the two types specified below — select also, dependent on the type of finished roofing specified — pitch or asphalt.*

(7a) Over the wood roof deck first lay a layer of coated (rosin sized) building paper lapped 2 inches at joints and nailed sufficiently to hold in position. Over the building paper lay two (2) plies (lapped half) of 14 lb. saturated roofing felt. Nail the back edge of each sheet with tin-capped, galvanized, barbed roofing nails spaced 12 inches on center. All laps shall be mopped back 12 inches with hot **[coal tar pitch] [asphalt]**. Do not mop over this membrane until just prior to the laying of insulation.

NOTE: *Specify pitch with tar saturated felt and asphalt with asphalt felt.*

(7b) Over the wood roof deck lay two (2) plies (lapped half) of 34 lb. per square prepared asphalt roofing having one side coated. Lay coated side down. Nail the back edge of each sheet with tin-capped, galvanized, barbed roofing nails spaced 12 inches on center. All laps shall be mopped back 12 inches with hot asphalt. Do not mop over this membrane until just prior to the laying of insulation.

(7c) Wrap the vapor cut-off around edge and mop back 6 inches on top of insulation at walls, skylight curbs, and under monitor skylight sash.

(8) APPLICATION

Mop the exposed vapor cut-off felt liberally with hot **[coal tar pitch] [asphalt]**. Only sufficient area to provide complete embedment of each Celotex board shall be mopped at a time. Embed each board firmly in the bituminous mopping.

(8a) TWO LAYER INSULATION—Mop exposed surface of first layer liberally with hot **[coal tar pitch] [asphalt]**. Only sufficient area to provide complete embedment of each board shall be mopped at a time. Embed each board of second layer firmly in the bituminous mopping.

NOTE: *Specify pitch with tar saturated felt and asphalt with asphalt felt.*

APPLICATION C—OVER CONCRETE, THERMAX*, GYPSUM AND UNIT TILE

NOTE: *Where high humidities are maintained, use vapor cut-off as in paragraph (12).*

(9) ROOF DECK

(9a) GENERAL—The surface of the roof deck shall be reasonably smooth without depressions, broomed clean, free from dirt and loose material, and thoroughly dry.

(9b) UNIT TILE CONSTRUCTION—The joints of all tiles shall be properly pointed up.

NOTE: *Include (9b) where deck is of cement, gypsum, book or similar construction.*

(10) APPLICATION

(10a) PRIMING THE DECK—Prime the deck with asphalt primer.

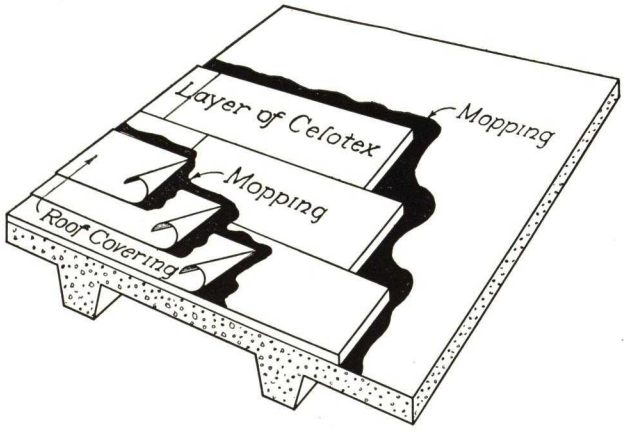
NOTE: *Include priming if asphalt mopping and asphalt felt are used for seal course. If pitch and felt are used, no primer is necessary. Use a liberal coating of waterproof primer over gypsum decks.*

NOTE: *No priming is necessary over Thermax.**

(10b) MOPPING THE DECK—[Mop the entire roof area] [spot or strip mop the individual tiles or units] with a coat of hot **[coal tar pitch] [asphalt].** Only sufficient area to provide complete embedment of each Celotex board shall be mopped at a time. Embed each board firmly in the bituminous mopping.

NOTE: *Specify pitch with tar saturated felt and asphalt with asphalt felt.*

NOTE: *If the deck is monolithic construction, (concrete, poured gypsum), the mopping shall be continuous. If the deck is of precast units (book tile, precast gypsum, concrete), coat the entire surface with a light and uniform mopping of asphalt; if coal tar pitch is used, spot or strip mop the individual units, keeping mopping back 4 inches from joints. Mop tile so as to prevent drippage.*



The word Celotex in the drawing above indicates Celotex brand Roof Insulation Board

NOTE: *When applied over Thermax,* Celotex Roof Insulation shall be laid at right angles to the longitudinal direction of the Thermax. The insulation shall be spot mopped with 180° to 200° M.P. asphalt and tacked at corners with 1¾ inch barbed roofing nails.*

(10c) TWO LAYER INSULATION

NOTE: *Same as paragraph (8a) under Application B on page 8.*

APPLICATION D—OVER STEEL ROOF DECKS

(11) ROOF DECK

The steel deck shall be securely anchored to the roof purlins and all joints shall be made rigid.

(12) VAPOR CUT-OFF

NOTE: *Include this seal course if the rooms beneath the roof carry high humidities.*

Mop entire roof area with a coat of hot asphalt. Over the mopping, while hot, lay two (2) plies (lapped half) of 14-lb. saturated roofing felt. Wrap vapor cut-off around edges of insulation and mop back 6 inches at walls, skylight curbs, and under monitor skylight sash. Do not mop over this membrane until just prior to laying of insulation.

(13) APPLICATION

Mop the **[deck] [vapor cut-off]** with a liberal coat of hot asphalt. Only sufficient area to completely embed each Celotex board shall be mopped at a time. Embed each board firmly.

(13a) TWO LAYER INSULATION—Mop the exposed surface of the first layer liberally with hot asphalt. Only sufficient area to provide complete embedment of each Celotex board shall be mopped at a time. Embed each board of the second layer firmly in the bituminous mopping.

(13b) FOR STEEP DECKS—In addition to the mopping, each Celotex board shall be secured to the steel deck, along the top, with three (3) bolts, metal darts, sheet metal screws or other effective device.

*THERMAX TRADE MARK **This trade mark identifies a slab composed of long tough wood shreds completely coated with fire resisting cement, manufactured and sold by the Celotex Corporation.**

CELOTEX PROTECTION BOARD

DESCRIPTION—Ferox-treated Celotex Cane Fiber Insulation Board impregnated with selected bitumens by a special process.

SIZE, THICKNESS, ETC.—Units are unpainted, 24½ x 49 in. in area, ¼ and ½ in. thick. Edges are square.

RECOMMENDED USES—Celotex Protection Board has two major uses—as resilient cushioning under wood block flooring and to reduce sound transmission and drum effect (see Celotex Insulation Catalog), and as protection of waterproofing courses.

Waterproofing courses of saturated felt and asphalt or pitch must be carefully safeguarded against mechanical injury until they are permanently enclosed by masonry or some other protective construction. Such membranes are constructed to resist hydrostatic pressures; if they leak at any point, water will penetrate them and their usefulness ceases. A heavy investment may easily be destroyed by a small punc ture in the membrane. Celotex Protection Board, applied in pitch or asphalt to the surfaces to be protected, provides an economical method of shielding such membranes from mechanical abrasion or damage.

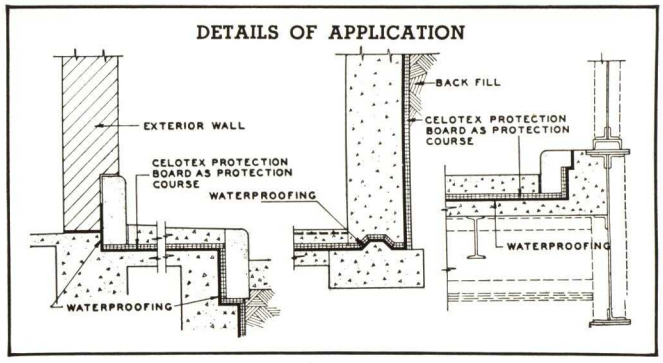
APPLICATION SPECIFICATIONS—WATERPROOFING PROTECTION

(1) WATERPROOFING—Waterproofing or dampproofing treatment shall be applied to wall or floor areas in accordance with established specifications.

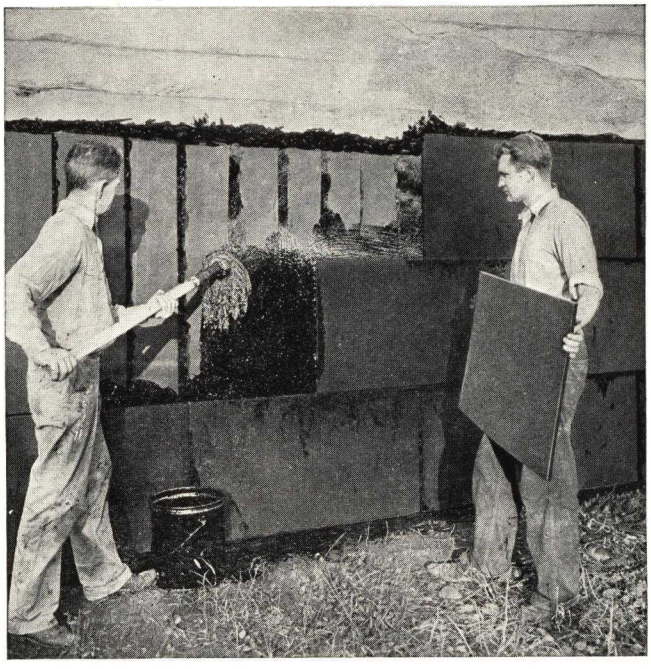
(2) APPLICATION OF CELOTEX PROTECTION BOARD—As the waterproofing treatment is given its final mopping, embed a layer of Celotex Protection Board promptly therein with joints broken and all edges in moderate contact.

On vertical surfaces use a wooden mallet to procure over-all contact; on horizontal surfaces press down on all units to insure intimate bond.

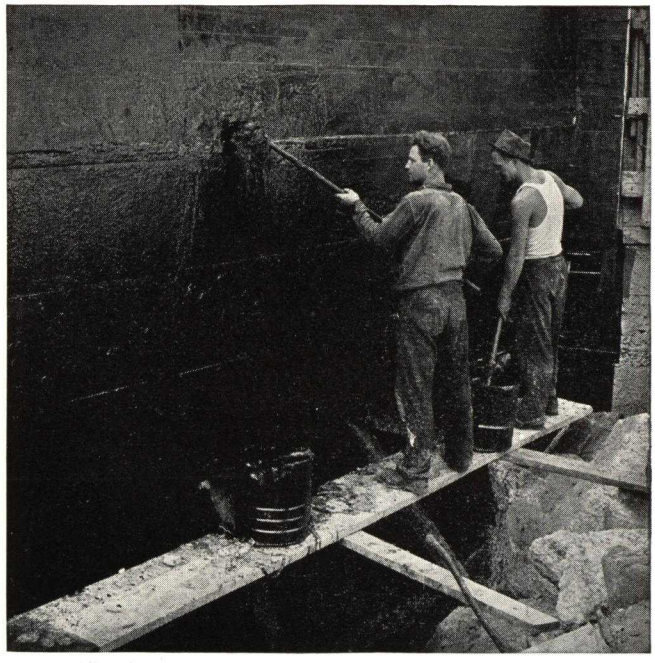
(3) BACK FILL OR MASONRY—Back filling, laying of finished floor and other subsequent operations should immediately follow application of Celotex Protection Board protection course.



NOTE: *For moderate conditions Celotex Roof Insulation may be used. Size, 22 x 47 inches, 1/2 and 1 inch thicknesses.*



The sturdy units of Celotex Protection Board assure speedy application and a protection for membrane waterproofing



Celotex Protection Board applied as protection course on foundation of State Parkway Bridges, New York City

CELOTEX TRAFFIC TOP

DESCRIPTION—Ferox-treated Celotex Cane Fiber Insulation Board impregnated with selected bitumens by a special process. Edges are slightly beveled.

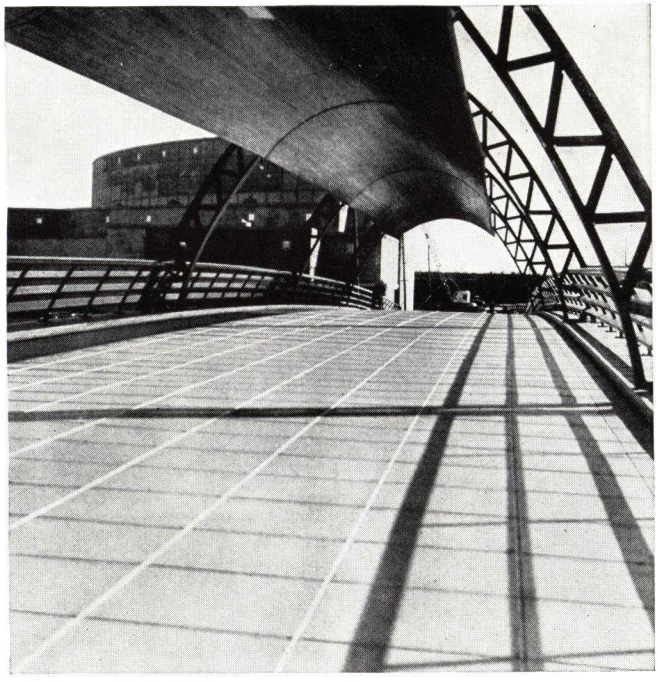
COLORS—Black, green and red.

SIZES AND THICKNESSES—Units are 12 x 24 in. and 24 x 28 in. in area, ¼ and ½ in. thick.

RECOMMENDED USES—Promenade surfaces on roofs, play courts, ramps, aisleways, and other similar surfaces subjected to foot traffic and exposed to the outside weather.

APPLICATION—Celotex Traffic Top shall be installed in strict accordance with the manufacturer's specification by an approved Celotex Traffic Top Distributor.

TYPICAL INSTALLATIONS OF CELOTEX TRAFFIC TOP



At the New York World's Fair, Celotex Traffic Top adds a springy surface to the ramp leading to the Administration Building

Hours of relaxation in fresh air are made possible in congested areas by the application of Celotex Traffic Top on a flat deck

Attractive and comfortable promenade of Celotex Traffic Top at the Cleveland Skating Club

Celotex Traffic Top on play area of Manhattan Shelter, New York City

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919 North Michigan Avenue
CHICAGO, ILLINOIS

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RICHMOND, CALIFORNIA
YORK, PENNSYLVANIA

ROOFING PRODUCTS Section

« See INSULATION and ACOUSTICAL Sections »

Certain-teed

BUILT-UP ROOFS

CERTAIN-TEED PRODUCTS CORPORATION
General Offices New York, N. Y.

INDEX AND CHART ON CERTAIN-TEED SPECIFICATION ROOFS

Years of Bond Guarantee	Specification No.	Underwriters' Rating	Page No.	Type of Deck	Roof Deck Incline per foot, in.	Surface or Finish	Construction: No. of Layers of Material	Construction: No. of Moppings	Weight of Materials per Square: Roofing Asphalt	Asphalt Primer	Asphalt Felt	Gravel	Sheathing Paper	Coal Tar Pitch	Tarred Felt	19 in. Selvage Edge Roofings	Weight per Square Applied, lbs.
ASPHALT FELT AND ASPHALT, MINERAL SURFACED																	
10	522	C	3	Wood	1″ to 12″	Mineral Granules	One 30 lb. Asphalt Felt; Two 19″ Selvage Edge Roofing.	2	60	...	32	.....	x	.....	...	88	180
	523	C	4	Concrete	1″ to 12″	Mineral Granules	One 15 lb. Asphalt Felt; Two 19″ Selvage Edge Roofing.	3	90	8*	16	.....	...	.....	...	88	202
15	525	C	4	Wood	1″ to 12″	Mineral Granules	One 30 lb. and One 15 lb. Asphalt Felt; Two 19″ Selvage Edge Roofing.	3	90	...	48	.....	x	.....	...	110	248
	526	C	4	Concrete	1″ to 12″	Mineral Granules	Two 15-lb. Asphalt Felt; Two 19″ Selvage Edge Roofing.	4	120	8*	32	.....	...	.....	...	110	270
20	678	C	4	Wood or Precast Gypsum	1″ to 2″	Mineral Granules	One 30 lb. Asphalt Felt; Two 15 lb. Asphalt Felt; Two 19″ Selvage Edge Roofing.	4	120	...	64	.....	x	.....	...	110	294
	679	C	4	Concrete	1″ to 2″	Mineral Granules	Three 15 lb. Asphalt Felt; Two 19″ Selvage Edge Roofing.	5‡	150	8*	48	.....	...	.....	...	110	316
TARRED FELT AND PITCH, GRAVEL OR SLAG SURFACE																	
15	517	A	7	Wood	Up to 2″	Gravel or Slag	One No. 20 Sheathing Paper; Four 15 lb. Tarred Felt.	2‡	....	...	...	400♦	5	125	64	.....	594†
	514	A	8	Concrete	Up to 2″	Gravel or Slag	Three 15 lb. Tarred Felt.	3‡	....	...	...	400♦	...	175	48	.....	623†
20	513	A	8	Wood	Up to 2″	Gravel or Slag	One No. 20 Sheathing Paper; Five 15 lb. Tarred Felt.	3‡	....	...	...	400♦	5	150	80	.....	635†
	512	A	8	Concrete	Up to 2″	Gravel or Slag	Four 15 lb. Tarred Felt.	4‡	....	...	...	400♦	...	200	64	.....	664†
ASPHALT FELT AND ASPHALT, SMOOTH SURFACE																	
10	506	C	7	Wood	½″ to 12″	Smooth	One 30 lb. Asphalt Felt; Two 15 lb. Asphalt Felt.	3	90	...	64	.....	...	.....	...	.....	154
	507	C	7	Concrete	½″ to 12″	Smooth	One 30 lb. Asphalt Felt; Two 15 lb. Asphalt Felt.	4	120	8*	64	.....	...	.....	...	.....	192
ASPHALT FELT AND ASPHALT, GRAVEL OR SLAG SURFACED																	
10	508	A	5	Wood	½″ to 3″	Gravel or Slag	One 30 lb. Asphalt Felt; One 15 lb. Asphalt Felt.	1‡	80	...	48	400♦	x	....	...	.....	528†
	509	A	5	Concrete	½″ to 3″	Gravel or Slag	One 30 lb. Asphalt Felt; One 15 lb. Asphalt Felt.	2‡	110	8*	48	400♦	...	....	...	.....	566†
15	518	A	5	Wood	½″ to 3″	Gravel or Slag	One 30 lb. Asphalt Felt; Two 15 lb. Asphalt Felt.	2‡	110	...	64	400♦	x	....	...	.....	574†
	519	A	6	Concrete	½″ to 3″	Gravel or Slag	Three 15 lb. Asphalt Felt.	3‡	140	8*	48	400♦	...	.....	...	.....	596†
20	520	A	6	Wood	½″ to 3″	Gravel or Slag	One 30 lb. Asphalt Felt; Three 15 lb. Asphalt Felt.	3‡	140	...	80	400♦	x	....	...	.....	620†
	521	A	6	Concrete	½″ to 3″	Gravel or Slag	Four 15 lb. Asphalt Felt.	4‡	170	8*	64	400♦	...	....	...	.....	642†

For Roofs Over Insulation, Steel, etc., see Specification No. 527.

Flashings: 10 Year Roofs, see specification No. 528; 15 and 20 Year Roofs, see Specification No. 524.

*Approximate weight of 1 gallon of Certain-teed Liquid Asphalt Primer.

†Weight of gravel surfaced roof. Slag surfaced roof weighs 100 lbs. less.

‡Also one poured coat for top surfacing of gravel or slag.

♦If slag is specified instead of gravel, use 300 lbs. of slag.

xRecommended before application of Built-Up Roofs.

CERTAIN-TEED BUILT-UP ROOF SPECIFICATIONS

Certain-teed Built-Up Roofs may be bonded on request in accordance with the special agreements and conditions which pertain to such roofs.

Bonded roofs of guaranteed Certain-teed products are applied by qualified applicators under careful supervision.

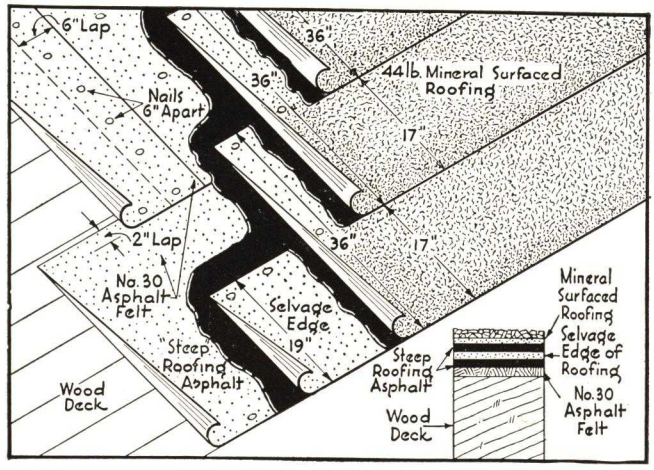
Ask your nearest Certain-teed representative for full details of the bonding procedure.

ASPHALT FELT AND ASPHALT — MINERAL SURFACED

Over Wood Sheathing or Precast Gypsum—SPECIFICATION NO. 522
Roof Incline 1″ to 12″ per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Asphalt Felt:
1 layer Certain-teed 30 lb. Asphalt Felt..... 32 lbs.
Asphalt:
2 moppings Certain-teed "STEEP" Roofing Asphalt. 60 lbs.
Nails:
For wood, use 1″ Simplex Nails or 1″ Large Head Roofing Nails. For Gypsum, use 1½″ cut nails through flat tin discs.
Surfacing:
2 layers No. 44 Certain-teed 19″ Selvage Edge Mineral Surfaced Roofing ..... 88 lbs.
Total Weight of Roof ..... 180 lbs.



10 YEAR ROOF

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 522

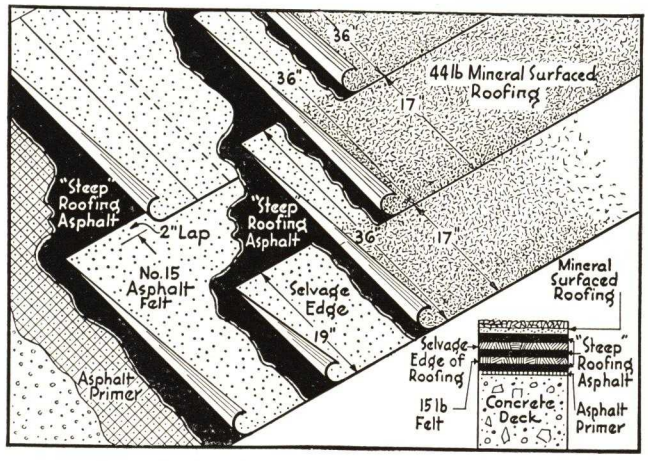
Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Wood Sheathing or Pre-cast Gypsum in accordance with Certain-teed Built-up Roof Specification No. 522.

Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available. Consult the nearest Certain-teed sales office for details.

Over Concrete or Poured Gypsum—SPECIFICATION NO. 523
Roof Incline 1″ to 12″ per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Primer:
1 coat Certain-teed Liquid Asphalt Primer..... 8 lbs.
Asphalt Felt:
1 layer Certain-teed 15 lb. Asphalt Felt..... 16 lbs.
Asphalt:
3 moppings Certain-teed "STEEP" Roofing Asphalt 90 lbs.
Surfacing:
2 layers Certain-teed 44 lb. 19″ Selvage Edge Mineral Surfaced Roofing ..... 88 lbs.
Total Weight of Roof..... 202 lbs.



10 YEAR ROOF

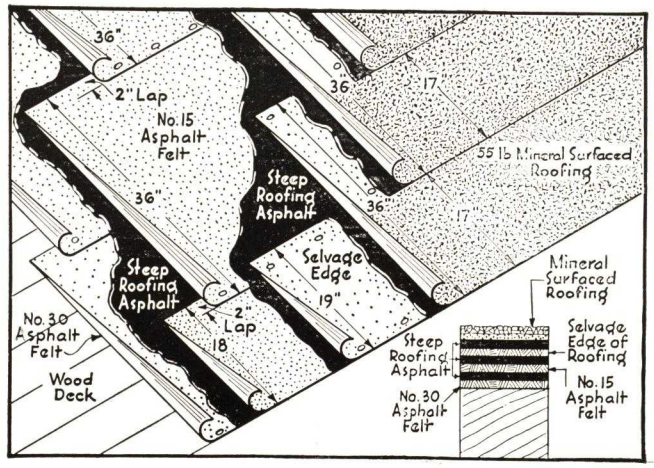
CONDENSED BUILT-UP ROOF SPECIFICATION NO. 523

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Concrete or Poured Gypsum in accordance with Certain-teed Built-up Roof Specification No. 523. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

Over Wood Sheathing or Precast Gypsum—SPECIFICATION NO. 525
Roof Incline 1″ to 12″ per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Asphalt Felt:
1 layer of Certain-teed 30 lb. Asphalt Felt..... 32 lbs.
1 layer of Certain-teed 15 lb. Asphalt Felt..... 16 lbs.
Asphalt:
3 moppings Certain-teed "STEEP" Roofing Asphalt.. 90 lbs.
Nails:
For Wood, use 1″ Simplex Nails or 1″ Large Head Roofing Nails. For Gypsum, use 1½″ cut nails through flat tin discs.
Surfacing:
2 layers Certain-teed 55 lb. 19″ Selvage Edge Mineral Surfaced Roofing ..... 110 lbs.
Total Weight of Roof..... 248 lbs.



15 YEAR ROOF

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 525

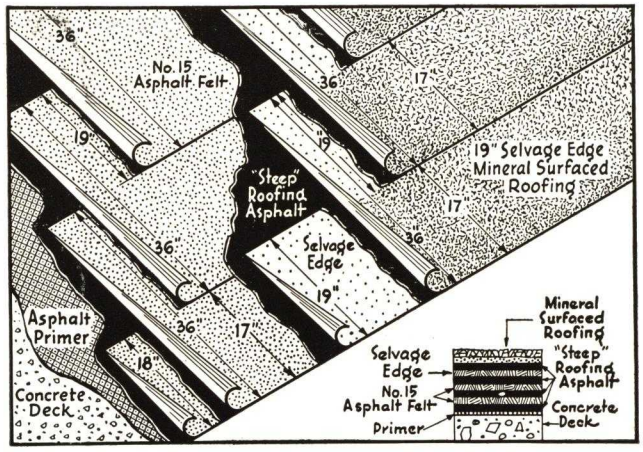
Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Wood Sheathing or Precast Gypsum in accordance with Certain-teed Built-up Roof Specification No. 525.

Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available. Consult the nearest Certain-teed sales office for details.

ASPHALT FELT AND ASPHALT — MINERAL SURFACED (Continued)

Over Concrete or Poured Gypsum—SPECIFICATION NO. 526

15 YEAR ROOF



Roof Incline 1" to 12" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

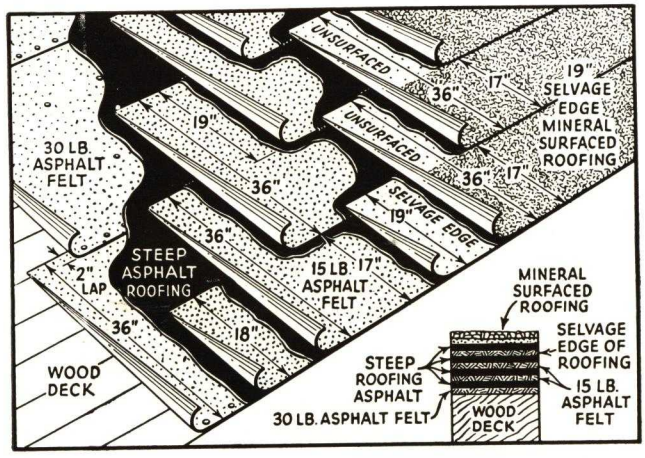
Primer:
1 coat Certain-teed Asphalt Primer..... 8 lbs.
Asphalt Felt:
2 layers Certain-teed 15 lb. Asphalt Felt..... 32 lbs.
Asphalt:
4 moppings Certain-teed "STEEP" Roofing Asphalt. 120 lbs.
Surfacing:
2 layers Certain-teed 55 lb. 19" Selvage Edge Mineral Surfaced Roofing ..... 110 lbs.
Total Weight of Roof..... 270 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 526

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Concrete or Poured Gypsum in accordance with Certain-teed Built-up Roof Specification No. 526. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

Over Wood Sheathing or Precast Gypsum—SPECIFICATION NO. 678

20 YEAR ROOF



BILL OF MATERIALS PER 100 SQUARE FEET

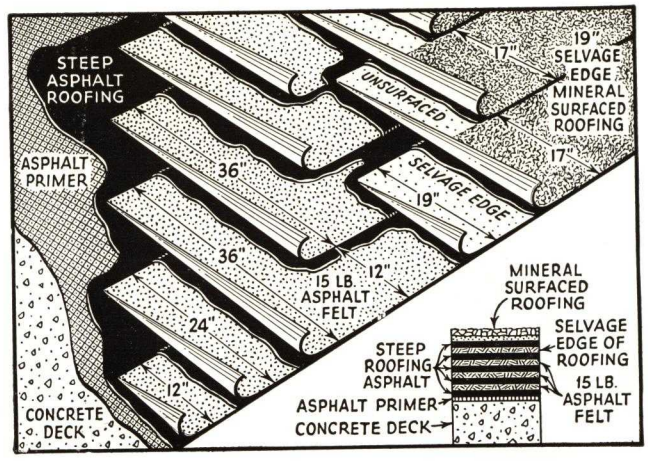
Asphalt Felt:
1 layer of Certain-teed 30 lb. Asphalt Felt..... 32 lbs.
2 layers of Certain-teed 15 lb. Asphalt Felt..... 32 lbs.
Asphalt:
4 moppings Certain-teed "STEEP" Roofing Asphalt..120 lbs.
Nails:
(See above)
Surfacing:
2 layers Certain-teed 55 lb. 19 in. Selvage Edge Roofing.....110 lbs.
Total Weight of Roof.....294 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 678

Certain-teed Asphalt Felt, Certain-teed "STEEP" Roofing Asphalt and Certain-teed Selvage Edge Roofing shall be applied over Wood Sheathing or Pre-cast Gypsum in accordance with Certain-teed Built-up Roof Specification No. 678. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

Over Concrete or Poured Gypsum—SPECIFICATION NO. 679

20 YEAR ROOF



BILL OF MATERIALS PER 100 SQUARE FEET

Primer:
1 coat Certain-teed Asphalt Primer..... 8 lbs.
Asphalt Felt:
3 layers Certain-teed 15 lb. Asphalt Felt..... 48 lbs.
Asphalt:
5 moppings Certain-teed "STEEP" Roofing Asphalt..150 lbs.
Surfacing:
2 layers Certain-teed 55 lb. Mineral Surface Roofing..110 lbs.
Total Weight of Roof.....316 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 679

Certain-teed Asphalt Primer, Certain-teed Asphalt Felt, Certain-teed "STEEP" Roofing Asphalt and Certain-teed Mineral Surface Roofing shall be applied over Concrete or Poured Gypsum in accordance with Certain-teed Built-Up Roof Specification No. 679. Surety Bond will be furnished in jobs where Certain-teed Roof Inspection Service is available.

ASPHALT FELT AND ASPHALT — GRAVEL OR SLAG SURFACED

Over Wood Sheathing or Precast Gypsum—SPECIFICATION NO. 508

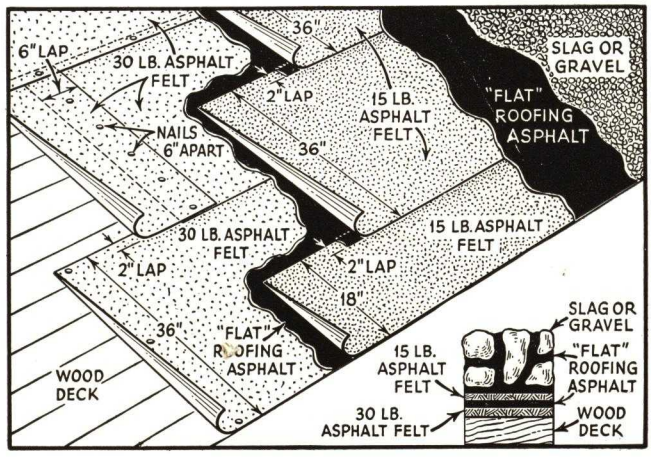
Roof Incline ½" to 3" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Asphalt Felt:
1 layer Certain-teed 30 lb. Asphalt Felt..... 32 lbs.
1 layer Certain-teed 15 lb. Asphalt Felt..... 16 lbs.
Asphalt:
1 mopping Certain-teed "FLAT" Roofing Asphalt.... 30 lbs.
1 flood coat Certain-teed "FLAT" Roofing Asphalt.. 50 lbs.
Nails:
For Wood, use 1" Simplex Nails or 1" Large Head Roofing Nails. For Gypsum, use 1½" cut nails through flat tin discs.
Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size..... 300 lbs.
Total Weight of Roof:
Gravel Surfaced .....528 lbs; Slag Surfaced..... 428 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 508

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Wood Sheathing or Precast Gypsum in accordance with Certain-teed Built-up Roof Specification No. 508. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.



10 YEAR ROOF

Over Concrete or Poured Gypsum—SPECIFICATION NO. 509

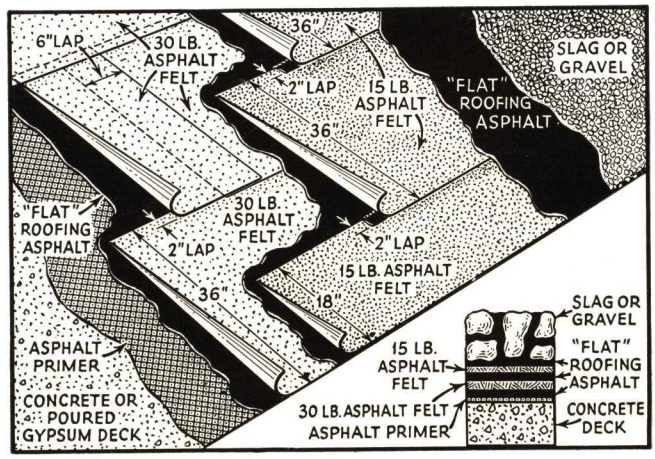
Roof Incline ½" to 3" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Primer:
1 coat Certain-teed Liquid Asphalt Primer..... 8 lbs.
Asphalt Felt:
1 layer Certain-teed 30 lb. Asphalt Felt..... 32 lbs.
1 layer Certain-teed 15 lb. Asphalt Felt..... 16 lbs.
Asphalt:
2 moppings Certain-teed "FLAT" Roofing Asphalt. 60 lbs.
1 flood coat Certain-teed "FLAT" Roofing Asphalt. 50 lbs.
Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size ..... 300 lbs.
Total Weight of Roof:
Gravel Surfaced ..... 566 lbs.; Slag Surfaced..... 466 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 509

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Concrete or Poured Gypsum in accordance with Certain-teed Built-up Roof Specification No. 509. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.



10 YEAR ROOF

Over Wood Sheathing or Precast Gypsum—SPECIFICATION NO. 518

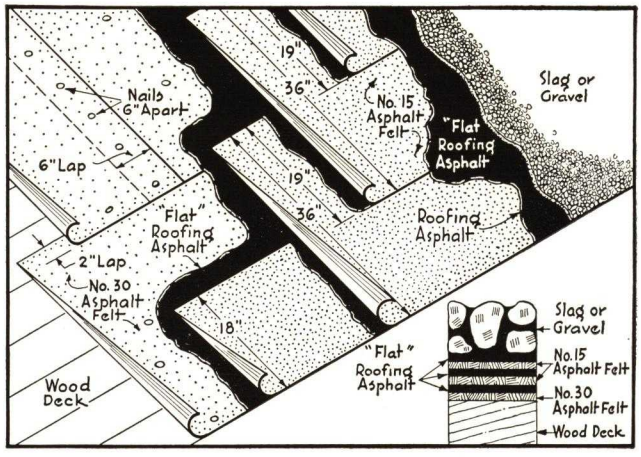
Roof Incline ½" to 3" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Asphalt Felt:
1 layer Certain-teed 30 lb. Asphalt Felt..... 32 lbs.
2 layers Certain-teed 15 lb. Asphalt Felt..... 32 lbs.
Asphalt:
2 moppings Certain-teed "FLAT" Roofing Asphalt. 60 lbs.
1 flood coat Certain-teed "FLAT" Roofing Asphalt. 50 lbs.
Nails:
For Wood, use 1" Simplex Nails or 1" Large Head Roofing Nails. For Gypsum, use 1½" cut nails through flat tin discs.
Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size..... 300 lbs.
Total Weight of Roof:
Gravel Surfaced..... 574 lbs.; Slag Surfaced..... 474 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 518

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Wood Sheathing or Precast Gypsum in accordance with Certain-teed Built-up Roof Specification No. 518. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

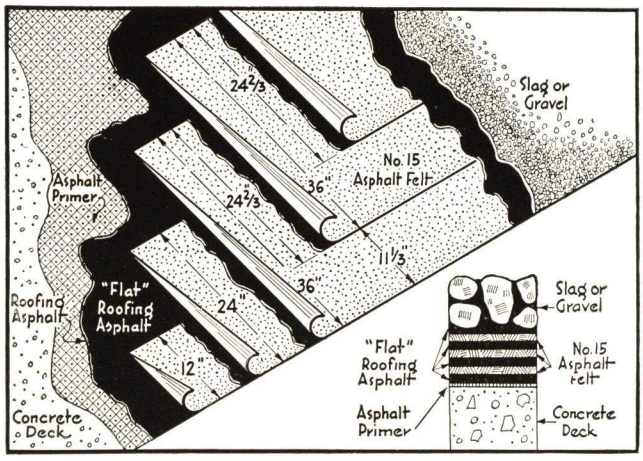


15 YEAR ROOF

ASPHALT FELT AND ASPHALT — GRAVEL OR SLAG SURFACED (Continued)

Over Concrete or Poured Gypsum—SPECIFICATION NO. 519

15 YEAR ROOF



Roof Incline ½" to 3" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Asphalt Primer:
1 coat Certain-teed Liquid Asphalt Primer..... 8 lbs.
Asphalt Felt:
3 layers Certain-teed 15 lb. Asphalt Felt..... 48 lbs
Asphalt:
3 moppings Certain-teed "FLAT" Roofing Asphalt.. 90 lbs.
1 flood coat Certain-teed "FLAT" Roofing Asphalt.. 50 lbs.
Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size..... 300 lbs.
Total Weight of Roof:
Gravel Surfaced 596 lbs.; Slag Surfaced..... 496 lbs.

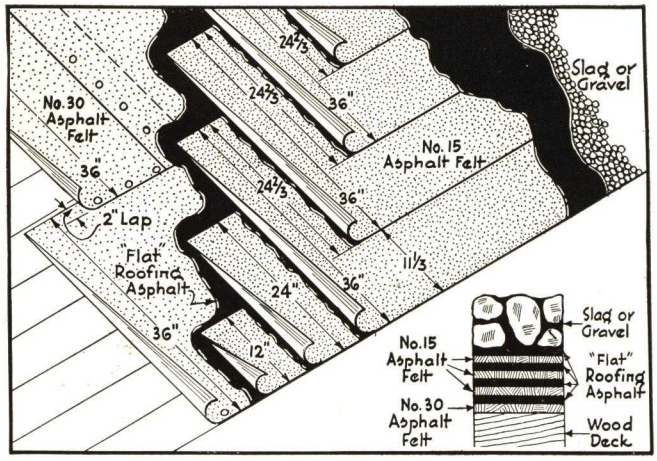
CONDENSED BUILT-UP ROOF SPECIFICATION NO. 519

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Concrete or Poured Gypsum in accordance with Certain-teed Built-up Roof Specification No. 519.

Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

Over Wood Sheathing or Precast Gypsum—SPECIFICATION NO. 520

20 YEAR ROOF



Roof Incline ½" to 3" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Asphalt Felt:
1 layer Certain-teed 30 lb. Asphalt Felt..... 32 lbs.
3 layers Certain-teed 15 lb. Asphalt Felt..... 48 lbs.
Asphalt:
3 moppings Certain-teed "FLAT" Roofing Asphalt.. 90 lbs.
1 flood coat Certain-teed "FLAT" Roofing Asphalt.. 50 lbs.
Nails:
For wood, use 1" Simplex Nails or 1" Large Head Roofing Nails. For Gypsum, use 1½" cut nails through flat tin discs.
Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size..... 300 lbs.
Total Weight of Roof:
Gravel Surfaced 620 lbs.; Slag Surfaced..... 520 lbs.

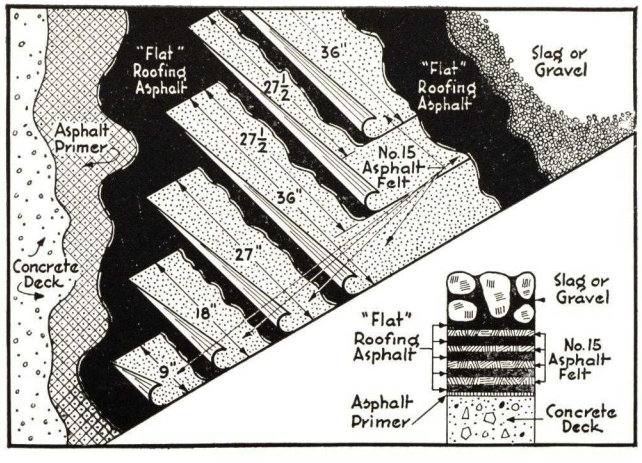
CONDENSED BUILT-UP ROOF SPECIFICATION NO. 520

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt to be applied over Wood Sheathing or Precast Gypsum in accordance with Certain-teed Built-up Roof Specification No. 520.

Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

Over Concrete or Poured Gypsum—SPECIFICATION NO. 521

20 YEAR ROOF



Roof Incline ½" to 3" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Asphalt Primer:
1 coat Certain-teed Liquid Asphalt Primer..... 8 lbs.
Asphalt Felt:
4 layers Certain-teed 15 lb. Asphalt Felt..... 64 lbs.
Asphalt:
4 moppings Certain-teed "FLAT" Roofing Asphalt.. 120 lbs.
1 flood coat Certain-teed "FLAT" Roofing Asphalt.. 50 lbs.
Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size..... 300 lbs.
Total Weight of Roof:
Gravel Surfaced 642 lbs.; Slag Surfaced..... 542 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 521

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Concrete or Poured Gypsum in accordance with Certain-teed Built-up Specification No. 521. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

ASPHALT FELT AND ASPHALT — SMOOTH SURFACE

Over Wood Sheathing or Precast Gypsum—SPECIFICATION NO. 506

Roof Incline ½" to 12" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Asphalt Felt:
1 layer Certain-teed 30 lb. Asphalt Felt..... 32 lbs.
2 layers Certain-teed 15 lb. Asphalt Felt..... 32 lbs.

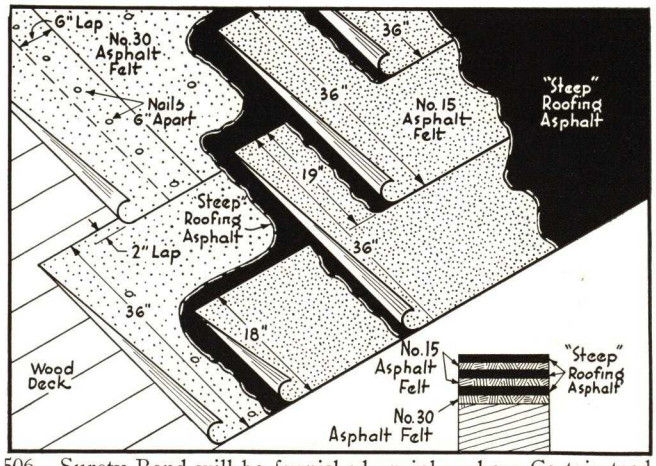
Asphalt:
3 moppings Certain-teed "STEEP" Roofing Asphalt. 90 lbs.

Nails:
For Wood, use 1" Simplex Nails or 1" Large Head Roofing Nails. For Gypsum, use 1½" cut nails through flat tin discs.

Total Weight of Roof:
Applied Roof..... 154 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 506

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Wood Sheathing or Precast Gypsum in accordance with Certain-teed Built-up Roof Specification No. 506. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.



10 YEAR ROOF

Over Concrete or Poured Gypsum—SPECIFICATION NO. 507

Roof Incline ½" to 12" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Primer:
1 coat Certain-teed Liquid Asphalt Primer..... 8 lbs.

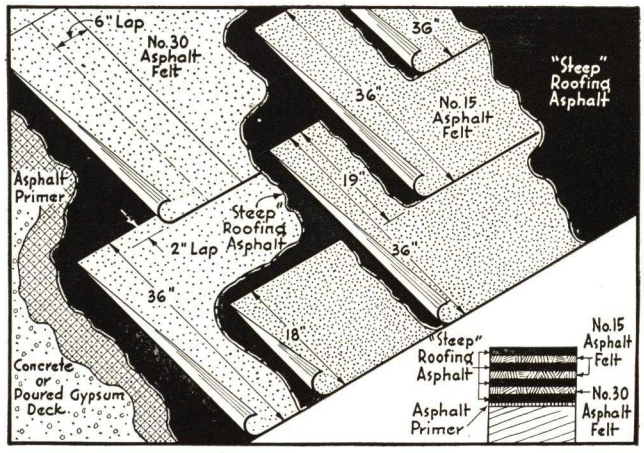
Asphalt Felt:
1 layer Certain-teed 30 lb. Asphalt Felt..... 32 lbs.
2 layers Certain-teed 15 lb. Asphalt Felt..... 32 lbs.

Asphalt:
4 moppings Certain-teed "STEEP" Roofing Asphalt. 120 lbs.

Total Weight of Roof:
Applied Roof..... 192 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 507

Certain-teed Asphalt Felt and Certain-teed Roofing Asphalt shall be applied over Concrete or Poured Gypsum in accordance with Certain-teed Built-up Roof Specification No. 507. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.



10 YEAR ROOF

TARRED FELT AND PITCH — GRAVEL OR SLAG SURFACED

Over Wood Sheathing or Precast Gypsum—SPECIFICATION NO. 517

Roof Incline Up to 2" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Sheathing Paper:
1 layer Certain-teed Sheathing Paper (Unsaturated) 5 lbs.

Tarred Felt:
4 layers of No. 15 Certain-teed Tarred Felt..... 64 lbs.

Pitch: Certain-teed Coal Tar Pitch..... 125 lbs.

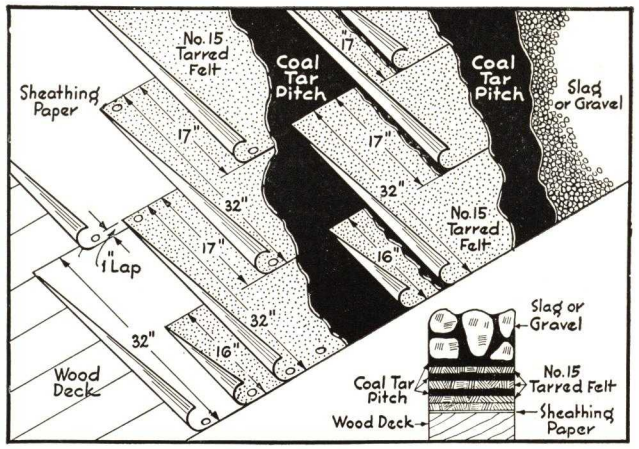
Nails:
For Wood, use 1" Simplex Nails or 1" Large Head Roofing Nails. For Gypsum, use 1½" cut nails through flat tin discs.

Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size..... 300 lbs.

Total Weight of Roof:
Gravel Surfaced.....594 lbs.; Slag Surfaced..... 494 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 517

Certain-teed Tarred Felt and Certain-teed Coal Tar Pitch shall be applied over Wood Sheathing or Precast Gypsum in accordance with Certain-teed Built-up Roof Specification No. 517. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

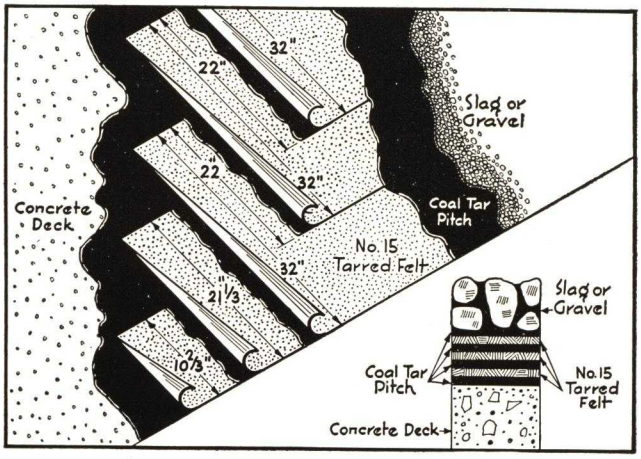


15 YEAR ROOF

TARRED FELT AND PITCH — GRAVEL OR SLAG SURFACED (Continued)

Over Concrete or Poured Gypsum—SPECIFICATION NO. 514

15 YEAR ROOF



Roof Incline Up to 2" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Tarred Felt:
3 layers of Certain-teed No. 15 Tarred Felt..... 48 lbs.

Pitch:
Certain-teed Coal Tar Pitch..... 175 lbs.

Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size..... 300 lbs.

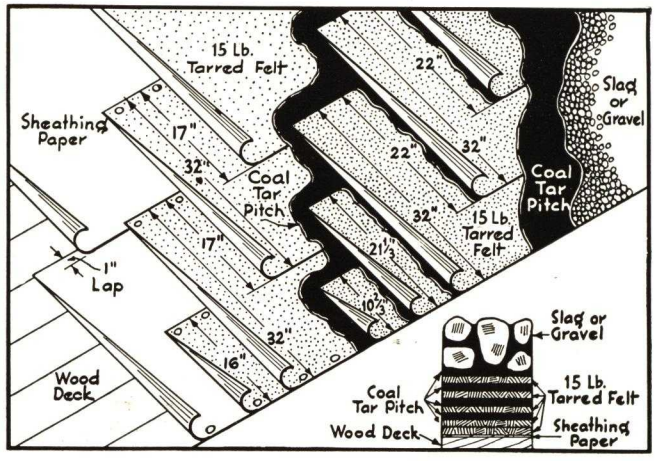
Total Weight of Roof:
Gravel Surfaced..... 623 lbs.; Slag Surfaced..... 523 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 514

Certain-teed Tarred Felt and Certain-teed Coal Tar Pitch shall be applied over Concrete or Poured Gypsum in accordance with Certain-teed Roof Specification No. 514. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

Over Wood Sheathing or Precast Gypsum—SPECIFICATION NO. 513

20 YEAR ROOF



Roof Incline Up to 2" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Sheathing Paper:
1 layer Certain-teed Sheathing Paper (Unsaturated) 5 lbs.

Tarred Felt:
5 layers No. 15 Certain-teed Tarred Felt..... 80 lbs.

Pitch:
Certain-teed Coal Tar Pitch..... 150 lbs.

Nails:
For Wood, use 1" Simplex Nails or 1" Large Head Roofing Nails. For Gypsum, use 1½" cut nails through flat tin discs.

Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size..... 300 lbs.

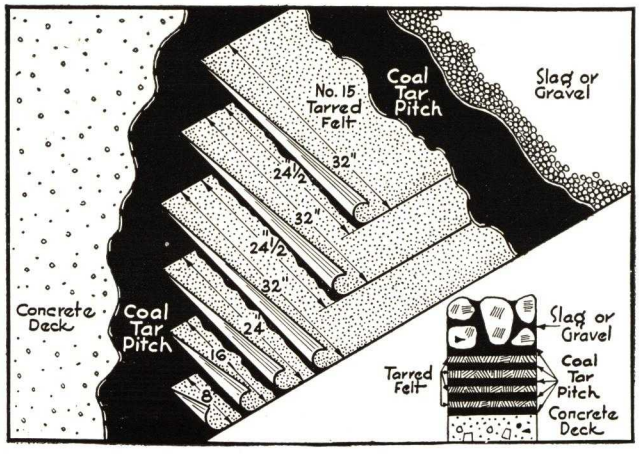
Total Weight of Roof:
Gravel Surfaced..... 635 lbs.; Slab Surfaced..... 535 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 513

Certain-teed Tarred Felt and Certain-teed Coal Tar Pitch shall be applied over Wood or Precast Gypsum in accordance with Certain-teed Built-up Roof Specification No. 513. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

Over Concrete or Poured Gypsum—SPECIFICATION NO. 512

20 YEAR ROOF



Roof Incline Up to 2" per Foot

BILL OF MATERIALS PER 100 SQUARE FEET

Tarred Felt:
4 layers of Certain-teed No. 15 Tarred Felt..... 64 lbs.

Pitch:
Certain-teed Coal Tar Pitch..... 200 lbs.

Surfacing:
Gravel, standard ¼" to ⅝" size..... 400 lbs.
Slag, standard ¼" to ⅝" size..... 300 lbs.

Total Weight of Roof:
Gravel Surfaced.....664 lbs.; Slag Surfaced..... 564 lbs.

CONDENSED BUILT-UP ROOF SPECIFICATION NO. 512

Certain-teed Tarred Felt and Certain-teed Coal Tar Pitch shall be applied over Concrete or Poured Gypsum in accordance with Certain-teed Built-up Roof Specification No. 512. Surety Bond will be furnished on jobs where Certain-teed Roof Inspection Service is available.

FLASHING SPECIFICATIONS

BASE AND COUNTER FLASHINGS

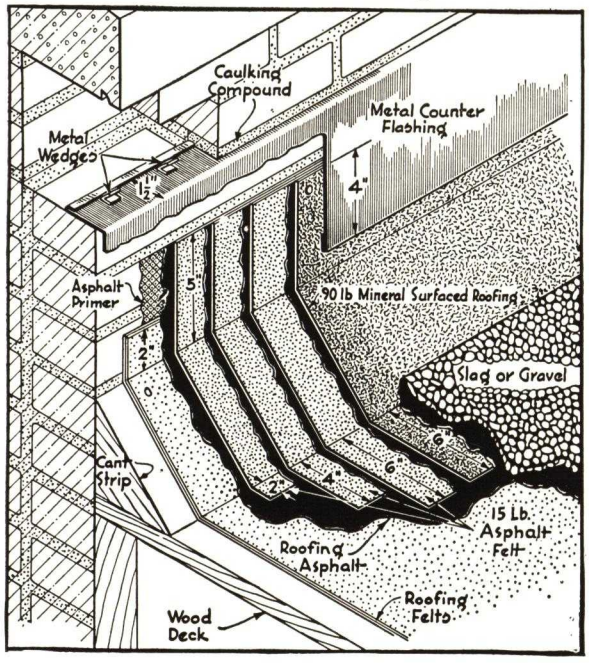
General: Certain-teed Flashing Specifications are approved and specified for use in connection with Certain-teed Built-Up Roofs. Special requirements not covered by these specifications may be elegible for approval upon submission of details to the CERTAIN-TEED PRODUCTS CORPORATION, New York.

Surety Bond: When these flashings are used in connection with Certain-teed Bonded Built-Up Roofs, the CERTAIN-TEED PRODUCTS CORPORATION will issue a surety bond on the flashing for the same period of years as the Built-Up Roofing bond is issued. Write for details.

For Certain-teed 20 and 15 Year Built-up Roofs

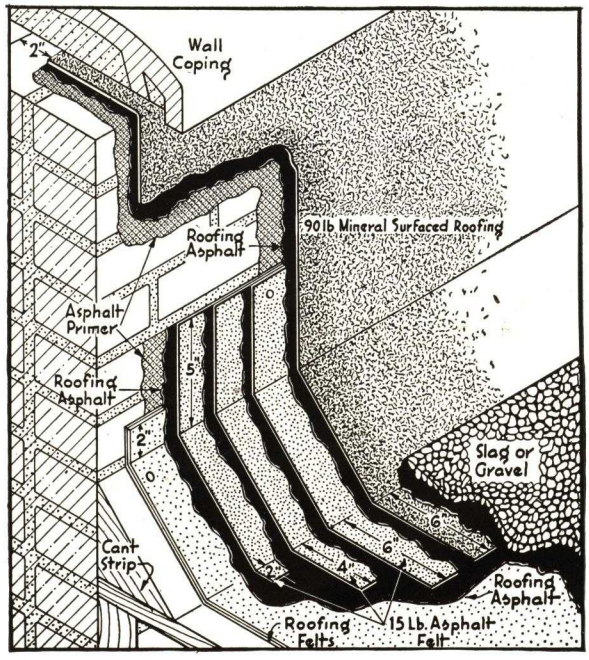
SPECIFICATION NO. 524—TYPE A

Mineral Surfaced Felt Base Flashing; Metal Counter Flashing



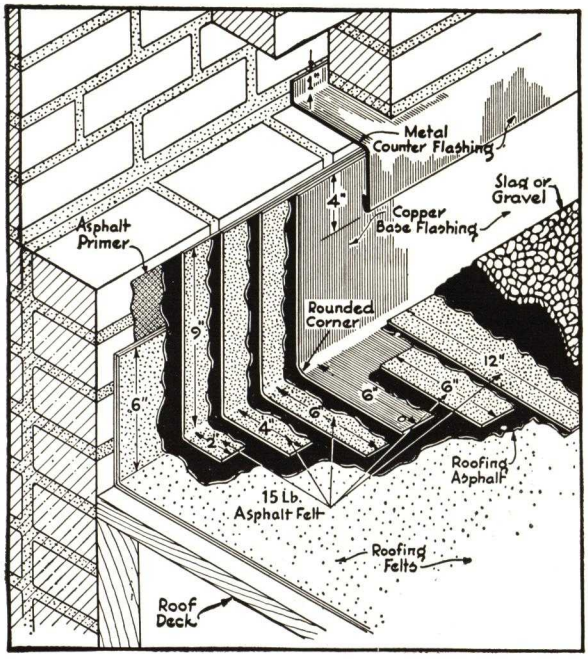
SPECIFICATION NO. 524—TYPE C

Mineral Surfaced Felt Base and Counter Flashing



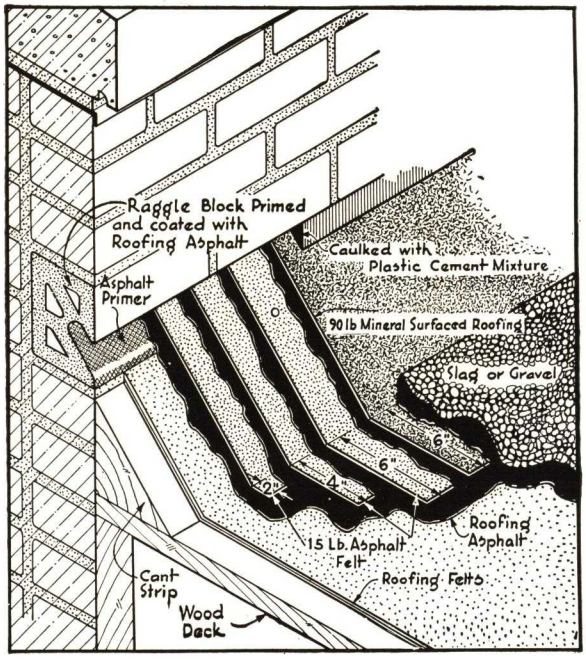
SPECIFICATION NO. 524—TYPE B

Metal Base Flashing; Metal Counter Flashing



SPECIFICATION NO. 524—TYPE E

Flashing with Raggle Blocks or Metal Forms



CERTAIN-TEED PRODUCTS CORPORATION

FLASHING SPECIFICATIONS (Continued)

BASE AND COUNTER FLASHINGS

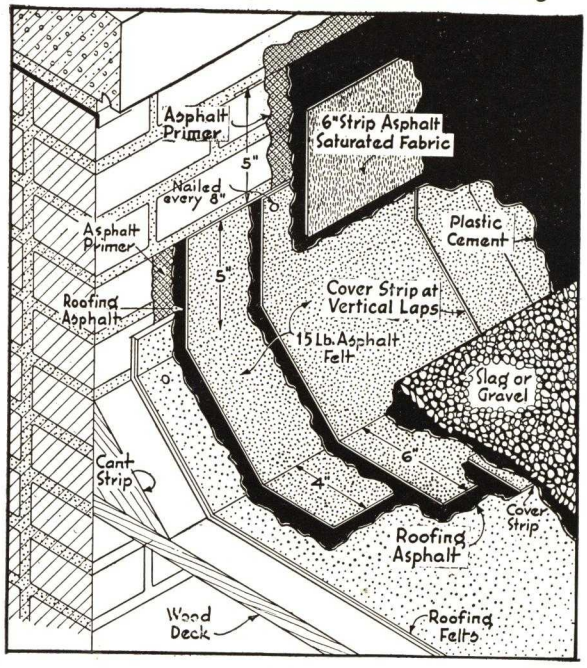
For Certain-teed 10 Year Built-up Roofs

Materials and Labels: All roofing materials used in Certain-teed flashings shall be manufactured or approved by the Certain-teed Products Corporation and shall be delivered to the job in their original packages bearing the manufacturer's registered label.

Cant Strips: Cant strip shall be of the same general material as the roof deck and of such consistency as to permit nailing. The strip shall extend up vertical wall surfaces at least 4 in. and the face shall have an incline of approximately 45°.

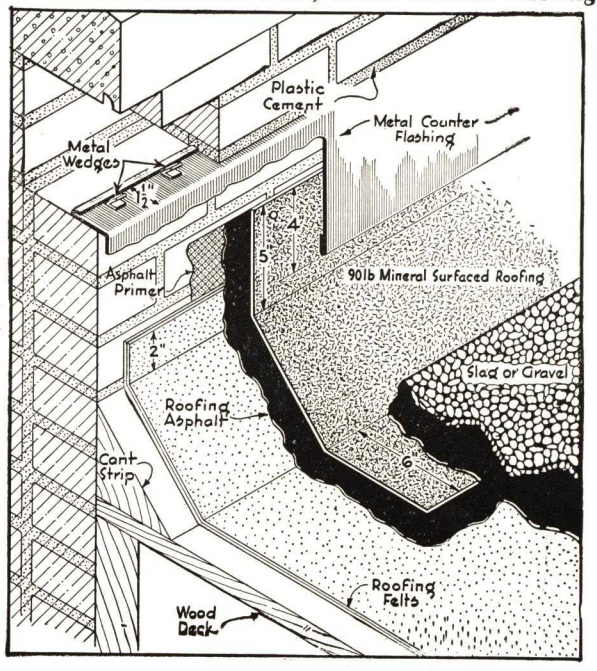
SPECIFICATION NO. 528—TYPE G

Felt Base Flashing; Fabric Counter Flashing



SPECIFICATION NO. 528—TYPE H

Mineral Surfaced Felt Base; Metal Counter Flashing



Pipes, Vents, etc. All vents, pipes or braces shall be properly flashed with sheet metal. They shall not be constructed through nor within 12 in. of the cant strip.

Raggle Blocks or Forms: If Raggle Blocks or Metal Forms are used, they shall be built into the walls so that the lower edge of the opening is approximately 6 in. above the roof deck surface.

Preparation of Surfaces: All concrete, brick and other masonry surfaces to be covered with Certain-teed Base and Counter Flashing, also including the surfaces of the opening in raggle blocks and forms, shall be dry and free from dust and dirt and shall be given one continuous coat of Certain-teed Asphalt Primer.

Masonry walls to be covered with Certain-teed Flashings shall be properly waterproofed at the top and sides or through wall to prevent seepage behind flashing.

Roof Base: All layers of felt used in the construction of the Built-Up Roof shall be carried over the cant strips or turned up on the wall as indicated. They shall be nailed every 12 in. along a line 1½ in. down from the top edge of the cant strip.

End Laps: All felts and roofing used in construction of these flashings shall be lapped at least 6 in. in the direction of the downward slope of the roof.

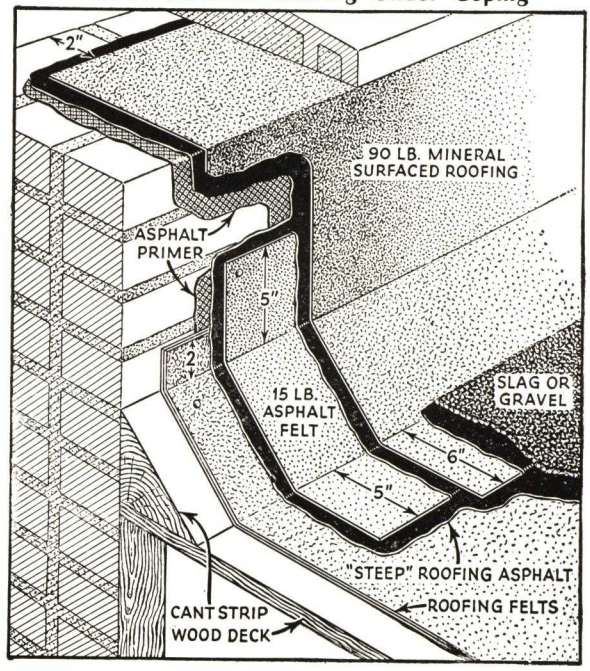
Base Flashing: The surface to be covered with Certain-teed Flashings shall be uniformly mopped with hot "STEEP" Asphalt (applied at the rate of about 25 lbs. per 100 sq. ft. for each mopping) into which, while hot, shall be embedded the base flashing sheets. The sheets shall be securely nailed along the top edges every 8 in. into the brick mortar joints or other surfaces provided for nailing.

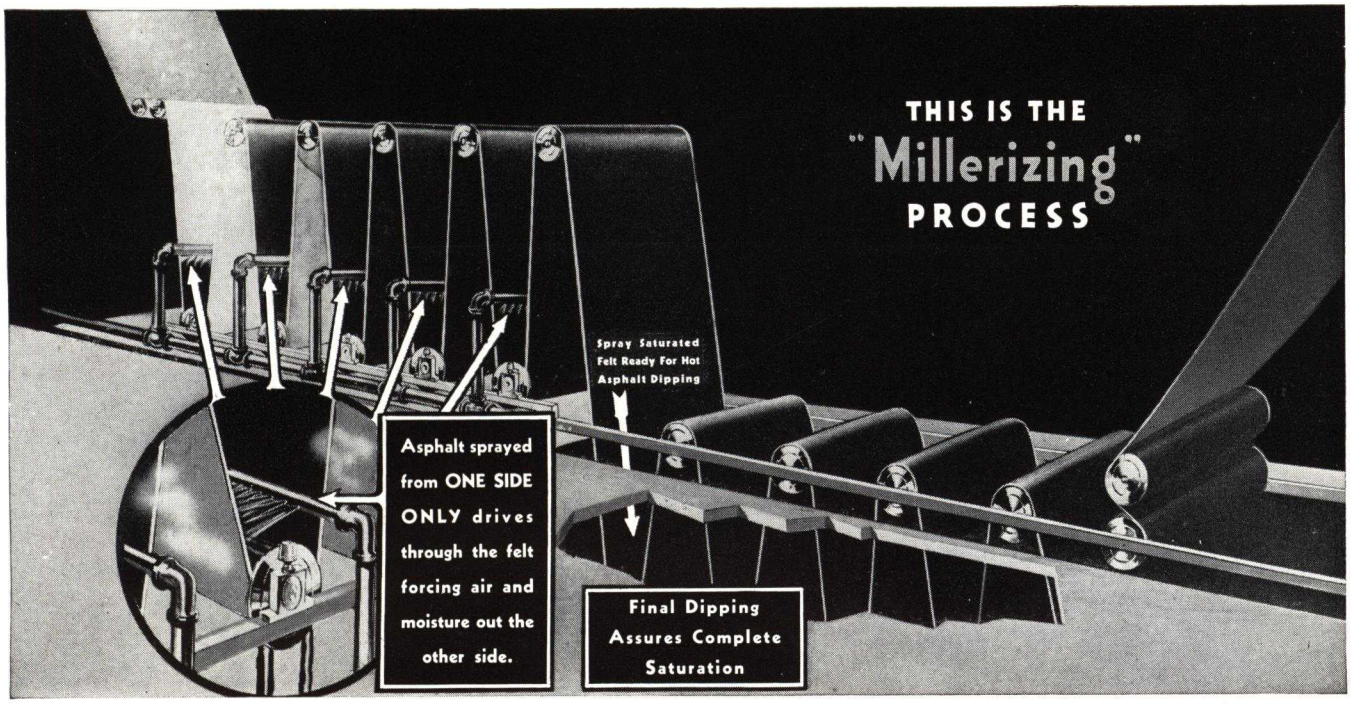
Counter Flashing: Metal Counter Flashings shall be of 3 lb. sheet lead or 16 oz. copper, not less than 7½ in. wide with edges properly turned. When 90 lb. Mineral Surfaced Roofing is used for Counter-flashing it shall be mopped in place with hot "STEEP" Roofing Asphalt. All mortar joints and other openings shall be filled and pointed up with Plastic Cement or Caulking compound.

Completing the Flashing: After the Flashings have been otherwise completed, the finish roof coat on the roof deck shall be carried over the base flashing to the bottom of the cant as indicated.

SPECIFICATION NO. 528—TYPE J

Mineral Surfaced Roofing Under Coping





"Millerizing" Process for Saturating Asphalt Felt

The best type of saturated felt for built-up Roofs or Roofing is a quality felt that is uniformly and completely saturated with a pure bitumen asphalt.

Certain-teed felts are scientifically saturated by an exclusive, controlled "Millerizing" Process which insures uniformity as well as maximum saturation. The saturation is applied to one side of the sheet over and again until it penetrates through to the other side. On its way through, the asphalt pushes out all air and moisture, filling all the hollow spaces and penetrating and saturating every fibre in the sheet. (See the illustration above for further description of the "Millerizing" Process.)

By means of this scientific method of saturation, it is possible to insure *uniform and complete saturation of every sheet* of Certain-teed saturated felt.

Certain-teed PRODUCTS

For Better Built-up Roofs

ASPHALT PRIMER • ASBESTOS ROOF COATING • PLASTIC CEMENT

15 POUND ASPHALT FELT • 30 POUND ASPHALT FELT • 15 POUND TARRED FELT

FLAT ROOFING ASPHALT • COAL TAR PITCH • STEEP ROOFING ASPHALT

20 POUND SHEATHING PAPER • ASPHALT SATURATED FABRIC

44 POUND 19" SELVAGE EDGE MINERAL SURFACED ROOFING

55 POUND 19" SELVAGE EDGE MINERAL SURFACED ROOFING

90 POUND MINERAL SURFACED ROOFING

CERTAIN-TEED PRODUCTS CORPORATION

General Offices, NEW YORK, N. Y.

QUALITY MADE *Certain*—SATISFACTION GUARAN*teed*

Certain-teed

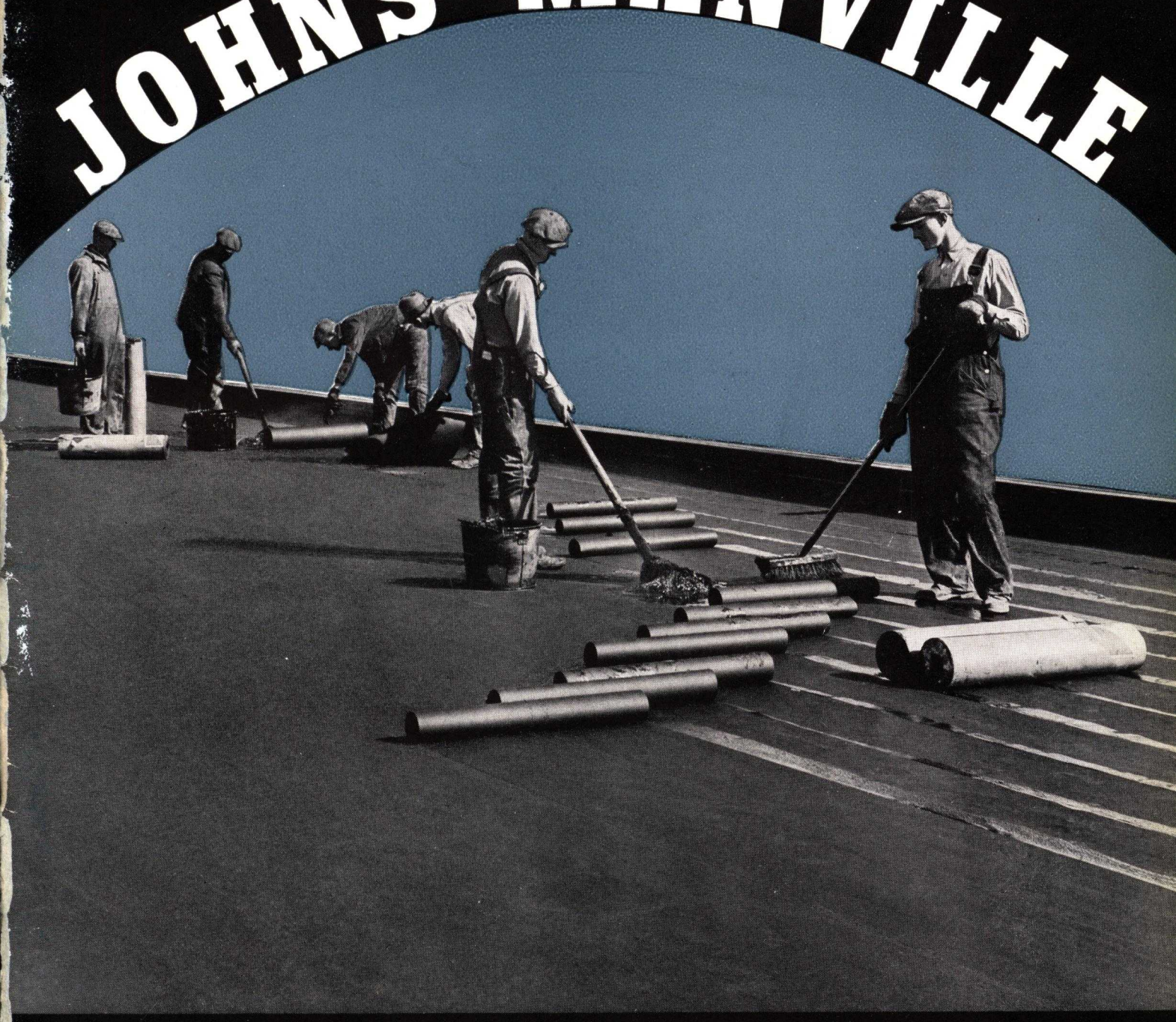
OFFERS ROOF BEAUTY—FIRE SAFETY—ECONOMY

AND PRIDE-OF-OWNERSHIP
IN A REVOLUTIONARY NEW ASPHALT
SHINGLE FOR ARCHITECTS USE

WOOD-TEX SHINGLES

CERTAIN-TEED PRODUCTS CORPORATION, NEW YORK, N. Y.

JOHNS-MANVILLE



Bonded

BUILT-UP ROOFS

JOHNS-MANVILLE
COMPLETE BUILT-UP ROOF SERVICE

REALIZING that no one type of built-up roof can be acceptable or usable under all conditions, and recognizing the factor of individual preference, Johns-Manville has developed a number of different types of built-up roofs and is in a position to furnish a roof to meet practically any condition or personal preference.

The various standard J-M Built-Up Roofs are tabulated, and condensed specifications given on page 8, with ratings of the Underwriters' Laboratories, Inc. The roofs are classified on the basis of quality, the kind and slope of deck, the type of felt, finish, etc. Detailed individual specifications begin on page 9.

SMOOTH-SURFACED ASBESTOS BUILT-UP ROOFS

While Johns-Manville furnishes built-up roofs of every type, the smooth-surfaced asbestos roof is recommended as the one best designed to stand up under all conditions and to give complete, trouble-free protection for the life of the building.

J-M Smooth-surfaced Asbestos Built-up Roofs are the outcome of several decades of study and experience in producing durable, fireproof, weatherproof, lightweight roofs at a moderate cost. They are suitable for practically every type of industrial building, warehouse, office building, hotel, hospital and apartment house.

They are built up of alternating layers of asphalt-saturated asbestos felt and roofing asphalt.

J-M Asbestos Felts, with which J-M Bonded Asbestos Roofs are built up, will not support combustion even when impregnated and coated with asphalt. The Underwriters' Laboratories, Inc., give Class A ratings to many different types of J-M Asbestos Roofs. They are fire-resistant to the highest degree.

J-M Bonded Roofing Asphalt—a relatively recent development in asphalt processing which has proved to be far superior to ordinary asphalts—is used on all J-M Bonded Asbestos Roofs. Tests at the Johns-Manville Research Laboratories at Manville, N. J., have demonstrated that the unusual ability of J-M Bonded Asphalt to stand up under all conditions of service will add years to the life of the roof.

OTHER TYPES OF J-M BONDED BUILT-UP ROOFS

In addition to Asbestos Roofs, Johns-Manville also supplies Combination Roofs, composed of a rag base felt and asbestos finishing felts, and a complete line of Slag or Gravel-surfaced Roofs, using tar-saturated asbestos felts, tar-saturated rag felts or asphalt-saturated rag felts. These types of J-M Bonded Roofs are also included in the table on page 8.

BOND BY NATIONAL SURETY CORP.

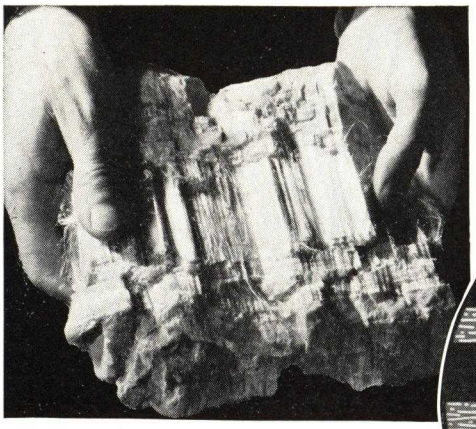
All Johns-Manville Built-up Roofs, except on the Pacific Coast, will, when desired, be covered by a bond of National Surety Corp., guaranteeing the performance of the particular roof for a period of from ten to twenty years, depending on the type of roof applied. This bond is issued only on roofs laid by Johns-Manville Approved Roofing Contractors and in connection with Johns-Manville inspection service.

As the best results are obtained only when the proper roofing is correctly laid, Johns-Manville has appointed Approved Roofing Contractors throughout the country, whose appointments have been based upon experience, integrity and financial responsibility.

Johns-Manville maintains a corps of inspectors whose services are available in connection with bonded built-up roofs. This service is required in connection with every roof which is to be bonded, both before, during and after application.

Johns-Manville

22 East 40th St., New York, N. Y. JOHNS-MANVILLE JM PRODUCTS Offices in All Large Cities

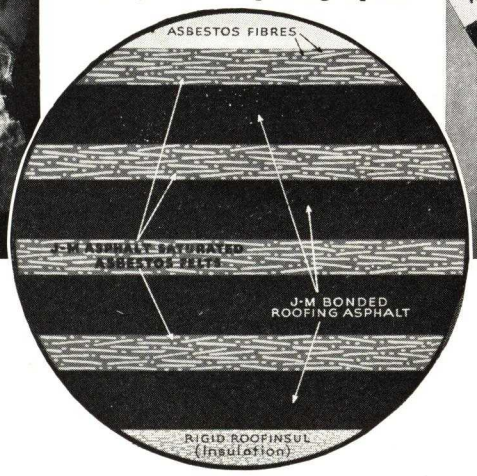


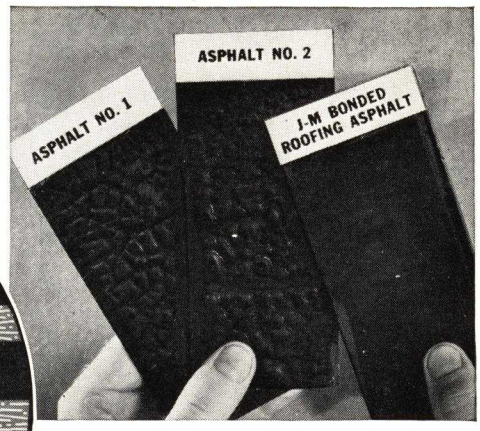
ASBESTOS IN ITS NATURAL STATE

Asbestos — fibres of stone, fireproof, rot-proof, enduring—forms the base of a Johns-Manville Built-up Roof. Here crude asbestos fibres are shown in their natural state, attached to the rock matrix.

A CROSS-SECTIONAL DIAGRAM OF A 3-PLY ASBESTOS ROOF

The fibres of asbestos felt protect the impregnating asphalt from the sun, and each ply of felt acts as a protective blanket to the underlying layer of waterproofing asphalt.





RESULTS OF ASPHALT TESTS

After water, heat and cold were played on these samples of roofing asphalt for the equivalent of 10 years of actual weathering, J-M Bonded Roofing Asphalt was still practically as good as new.

J-M Smooth-surfaced Asbestos Built-up Roofs give the best assurance of roof permanence

RESEARCH has been able to find no waterproofing agent better than asphalt, which is less brittle at low temperatures and less fluid at high temperatures than any other known waterproofing material. Yet there are many kinds and grades of asphalt.

In the effort to secure the permanence requisite in a good roofing asphalt, J-M research engineers have developed a processed asphalt known as J-M Bonded Filled Roofing Asphalt, which has shown marked superiority over other asphalts ordinarily used for such purpose. In a series of tests by machine accelerated weathering, the J-M Laboratories subjected samples of Bonded Roofing Asphalt and other commercial asphalts to alternating cycles of exposure to heat, rain and sub-zero temperature, equivalent to ten years of actual service. Although the samples were practically identical in appearance before testing, the illustration above shows how J-M Bonded Asphalt stood up when the others failed.

ASBESTOS FELT GIVES REINFORCEMENT

However, even the best asphalt cannot, alone, make a good roof. There must be a flexible reinforcement, durable and non-combustible, which can itself be impregnated with asphalt to keep it waterproof, and which at the same time will protect the asphalt from its one cause of deterioration — the drying-out action of the sun. Asbestos roofing felt meets these requirements exactly.

As used in built-up roofing, asbestos fibres are first felted and then impregnated with asphalt, thus making a flexible stone roofing material, fireproof and immune to rot and decay.

The characteristic difference between asbestos fibre and all other natural fibres is that asbestos fibre is a solid filament, not a hollow tube. There can be no capillary action through it.

This very lack of capillary action, and consequent resistance to impregnation, is the source of the protection which asbestos felt affords the vital waterproofing asphalt, once the felt has been impregnated with it. The essential oils of the asphalt are protected from evaporation due to the continuous drying-out action of the sun, which so rapidly deteriorates other types of roofing, and the asbestos built-up roof *stays* waterproof.

When the asbestos felt has been impregnated with J-M Bonded Roofing Asphalt, and Bonded Roofing Asphalt is used as the cementing layer between the plies of felt forming the built-up roof, the asphalt is preserved in practically its original condition. The result is a smooth-surfaced roof that *stays* waterproof for years, with minimum upkeep.

PROOF AGAINST FIRE AND DECAY

But asbestos does more than merely protect the asphalt from the sun, since asbestos felt is virtually felted fibres of stone, it cannot decay; it will not burn. Exhaustive tests by the Underwriters' Laboratories, have proved that asbestos felt, even when impregnated and coated with asphalt as used in a J-M Built-Up Roof, will not support combustion. J-M Asbestos Roofs are so fire-resistant that, in every type, there will be found roofs that carry the Underwriters' Class A rating, which takes the base rate of insurance.

The Advantages of a Johns-Manville Smooth-surfaced Asbestos Roof

Proved by time

The lasting qualities of a Johns-Manville Smooth-surfaced Asbestos Roof are clearly demonstrated on pages 6 and 7 on which are listed actual installations of this type of roof which have withstood the elements for more than 20 years.

Can be applied to every roof which will drain water

The use of dead level roof decks is not recommended. Roof decks should be graded to proper drains to prevent the formation of areas which will not drain. Undrained spots become unhealthful and breeding grounds for mosquitoes as well as creating unequal exposures of different parts of the roof surface, which creates the likelihood of developing unequal strains on the roofing.

No protective covering needed

Asbestos Roofing Felts do not require the use of slag or gravel for the protection of the asphalt and the felts. The asbestos in the felt prevents the sun from causing the deterioration or drying-out of the asphalt in and between the felts.

Highly fire-resistant

The J-M 20-year Smooth-surfaced Asbestos Roof is given a Class A rating, and the similar J-M 15-year Roof a Class B rating, by the National Board of Fire Underwriters.

Decay-proof

Asbestos felts, being made from rock fibre and asphalt, can not decay. The roof built up from these felts and asphalts will withstand heat and cold and the constant destructive action of the elements under all conditions.

Leaks easily located

An unforeseen accident or unusual expansion and contraction of the roof deck may damage any roof surface and cause it to leak. With a J-M Smooth-surfaced Asbestos Roof, any such damaged areas can be quickly located.

Easy to repair

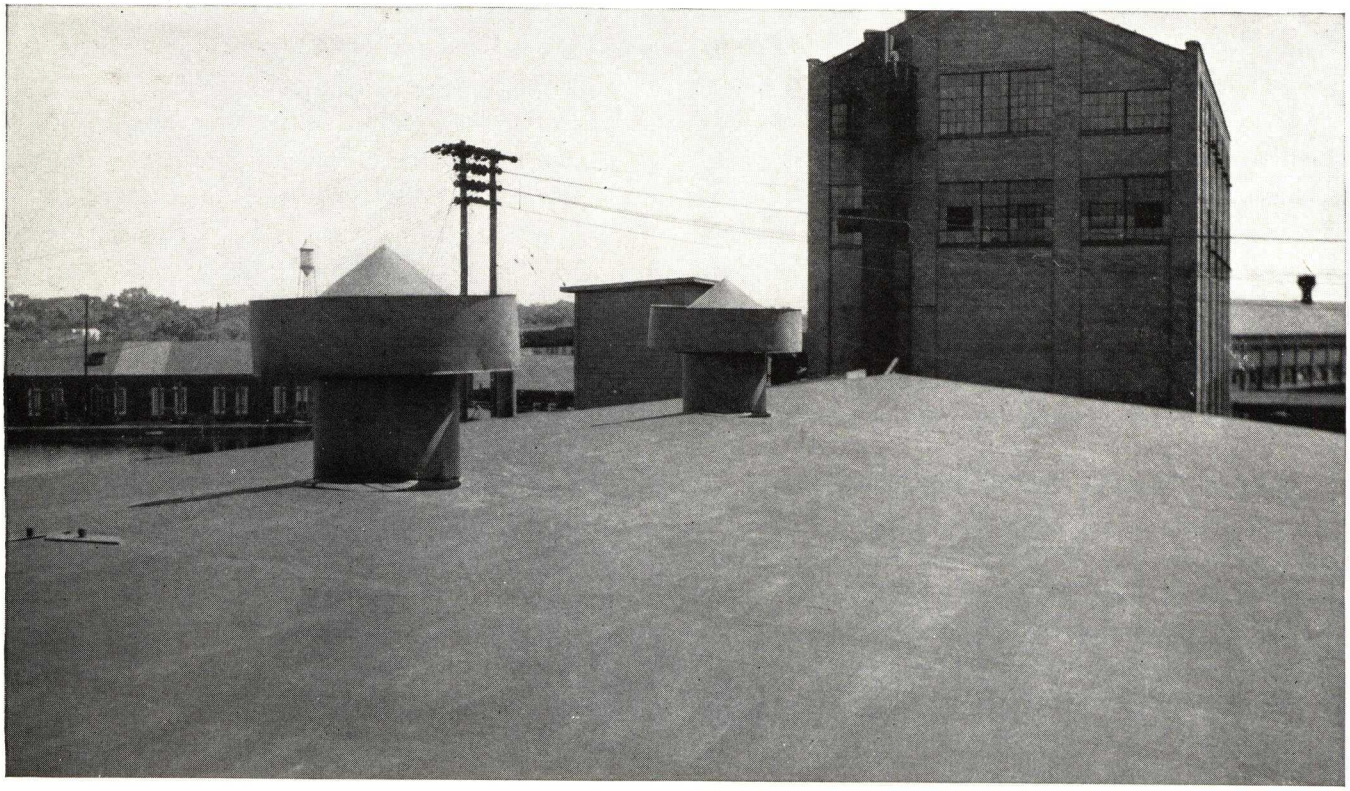
The construction of J-M Smooth-surfaced Asbestos Roofs is such that repairs can be made quickly and inexpensively.

No excessive weight

Since the smooth-surfaced asbestos felt roof finish does not require the protection of slag or gravel, construction savings are possible because it is not necessary to support the weight of such materials.

First cost is last cost for waterproofing

Everything included in the J-M built-up roof construction is a waterproofing in itself.



J-M Smooth-surfaced Asbestos Roof on the plant of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wisconsin

APPLYING J-M ROOFINSUL

Roof insulation not only saves fuel and assures comfortable interior temperatures, but also protects both the roof deck and the built-up roof itself.

6 Good Reasons for a Roofinsul-insulated Roof

1. Prevents condensation and roof drip

J-M Roofinsul prevents condensation on the under side of the deck and eliminates discoloration of ceilings and the annoyance and damage caused by roof drip.

Regardless of how carefully a wood deck may be constructed, vapors penetrate the planking and condense on the underside of the built-up roof. Rot starts at the top, unseen, and works down. While rot can be eliminated by the use of a concrete deck, condensation and roof-drip remain.

When air comes in contact with a cooler surface, such as the underside of a roof, its temperature is lowered. If the temperature of the surface is below the dew point of the water vapor in the air, the excess moisture is deposited on the surface as condensation. Insulation of the proper thickness will keep the temperature of the surface above the dew point and thus prevent the deposition of moisture.

2. Protects deck against rot and corrosion

By preventing condensation, J-M Roofinsul protects the deck against rot and corrosion. When the deck is of concrete or other non-combustible material, Roofinsul reduces the danger of cracking (commonly caused by sudden temperature changes) and thereby tends to prevent moisture from reaching the reinforcing steel members.

3. Prevents damage to roofing felts through deck movement

J-M Roofinsul protects the roofing felts themselves. All roof decks move, to some extent, under temperature changes. When this alternate expansion and contraction continues over a long period of time, any cracks which may occur in the deck may eventually be transmitted to the built-up roof unless there is an intervening layer of insulation. J-M Roofinsul not only minimizes movement of the deck by keeping its temperature more uniform, but also has sufficient resiliency to take up strains due to any movement which does occur.

4. Provides closer interior temperature control

J-M Roofinsul permits closer control over interior temperatures both in summer and winter, assuring more comfortable, uniform working conditions throughout the year. Uniform interior temperatures are also a vital necessity in the operation of many modern industrial processes.

5. Improves working conditions

Insulation with J-M Roofinsul effectively retards the passage of heat through the roofs, thus helping to keep the building cool in the summer and easier to heat in the winter.

6. Lowers heating and air-conditioning costs

On new construction, J-M Roofinsul makes it possible to reduce considerably the investment in heating and air-conditioning equipment. And on either new or old buildings, it lowers operating costs appreciably on such equipment.

JOHNS-MANVILLE ROOFINSUL

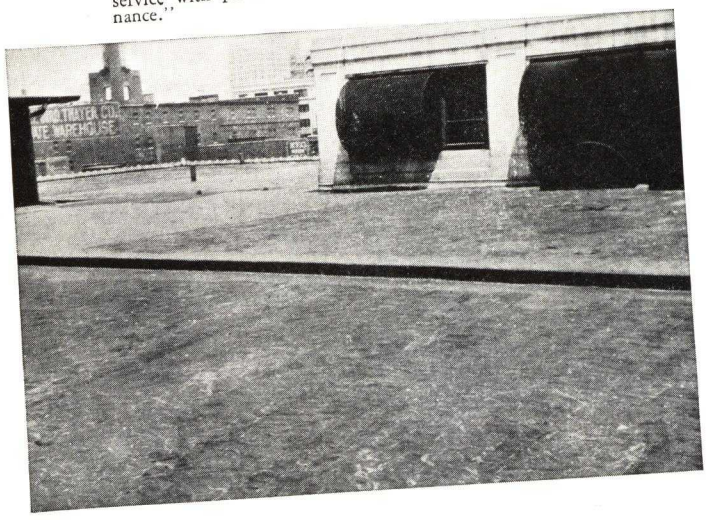
J-M Roofinsul was designed especially for use as insulation over roof decks, principally under J-M Bonded Asbestos Built-up Roofs. It is light in weight, has a high insulating value and is also rigid and structurally strong. J-M Roofinsul has a high resistance to moisture absorption. It lasts for years in the open and, when covered with a J-M Bonded Asbestos Roof, will last as long as the roof itself.

Any necessary number of layers of J-M Roofinsul can be installed to give the desired insulating efficiency, without adding appreciably to the total weight of the roof.

J-M Roofinsul is furnished in 24″ x 48″ sheets. The standard thickness is ½″. If sheets of greater thickness than ½″ are desired, two or more sheets are stapled together, with a ¾″ ship-lap joint on all four edges. Weight approximately 0.8 lb. per sq. ft., ½″ thick.

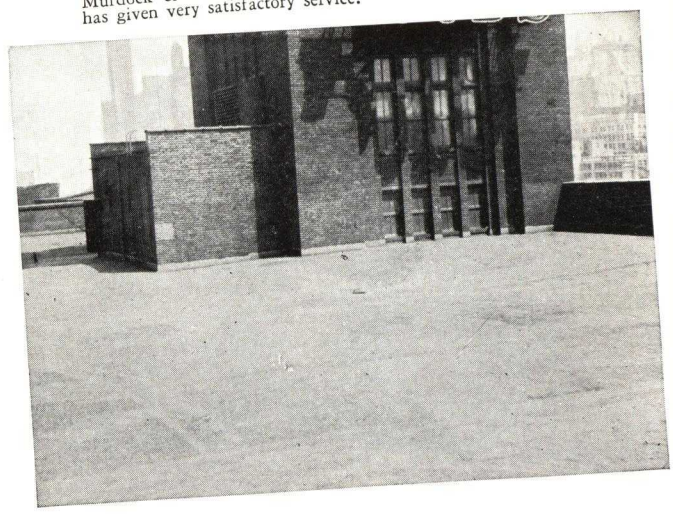
A 27-YEAR OLD AT KANSAS CITY, MO.

In 1912, this J-M roof was applied on the building of the Kansas City Star. Says the owner, "Certain portions are subjected to foot traffic, but it has given excellent service with practically no cost for repairs or maintenance."



A 26-YEAR OLD AT CHICAGO, ILL.

This J-M Asbestos Roof was laid in 1913 for Reid, Murdock & Company, 325 No. La-Salle St. The roof has given very satisfactory service.

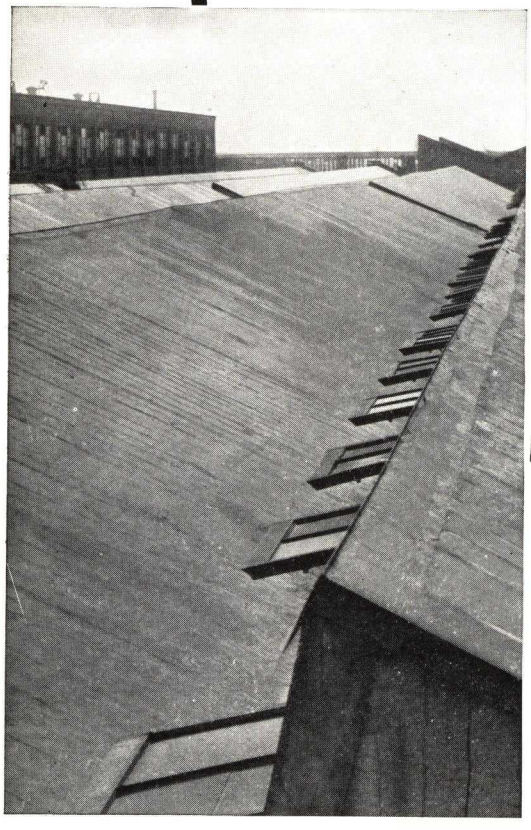


Some J-M Smooth-surfaced Asbestos Roofs prime, though more than 20 years old . . .

Johns-Manville Smooth-surfaced Asbestos Built-up Roofs have an unusual performance record, as evidenced by the roofs illustrated or listed on these pages. These are but a few of the many J-M roofs which have had a service life of 20 years or longer. . . .

Note the pleasing gray appearance of the roofs. As has previously been explained, this gray surface is the top-most layer of the asbestos fibres in the asbestos felt which blankets the vital waterproofing asphalt and protects it from the deteriorating action of the sun.

In addition to the nine roofs illustrated on these pages, there are many other Johns-Manville Built-up Roofs with service records of more than 20 years. The following represent a few typical examples:

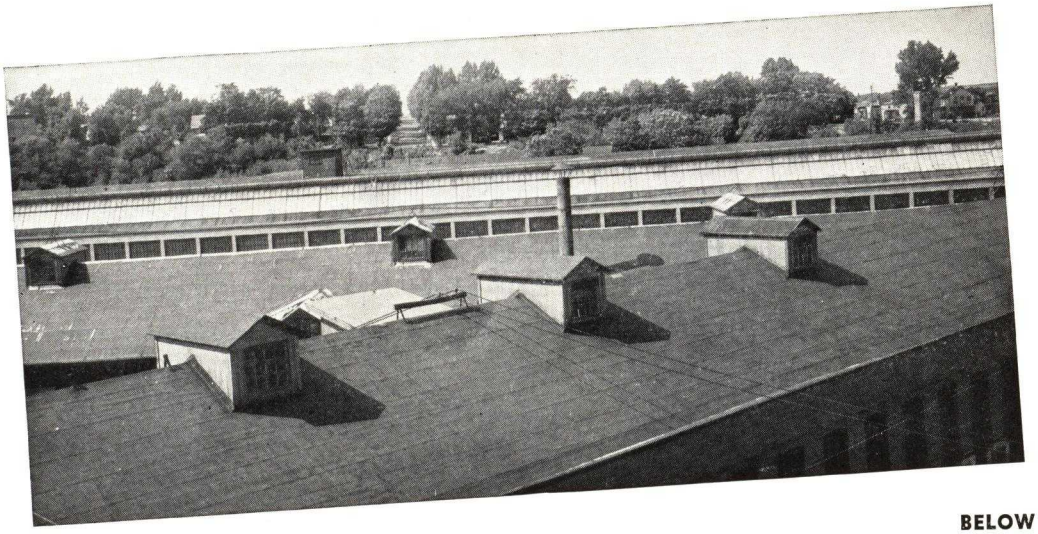


A 26-YEAR OLD AT SOUTH BEND, IND.

This J-M Smooth-surfaced Asbestos Roof has been protecting the Oliver Farm Equipment Co., factory for more than a quarter century.

A 29-YEAR OLD AT BEACH GROVE, IND.

This J-M Smooth-surfaced Asbestos Roof was applied in 1910. The photograph shows that it is still in good condition and will undoubtedly give many more years of satisfactory service.



LEFT . . . A 22-YEAR OLD AT WATERTOWN, N. Y.

Bagley and Sewall Company report that their J-M Smooth-surfaced Asbestos Roofs appear to be in condition to last many years longer.

which are still in their

At Detroit, Mich.

Detroit Baseball Company reports. "Your asbestos roofs were installed in 1912 on right and left field pavilions at Navin Park. They have withstood weather and the added punishment of thousands of baseballs striking them. The material appears in good condition."

At Bluefield, W. Va.

Huff, Andrews and Thomas Company writes about their J-M roof, "Overhead expense has been reduced to a minimum. . . . Anticipate many more years of service on this roof."

At Seattle, Wash.

The world war had just started when a J-M roof was applied on the Lincoln High School in Seattle. The asbestos felts are in splendid shape today.

At Louisville, Ky.

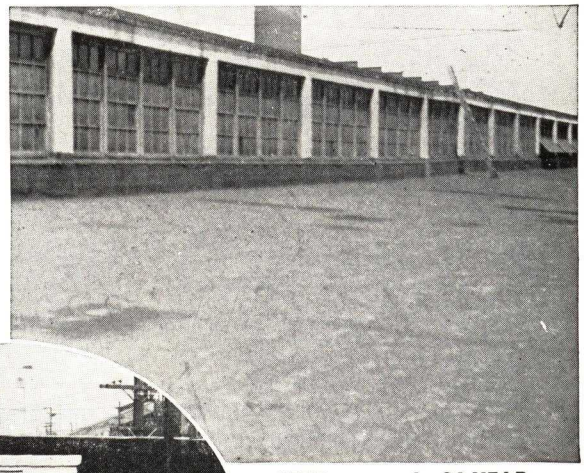
National Distillers Products Corporation writes, "The performance more than speaks for itself."

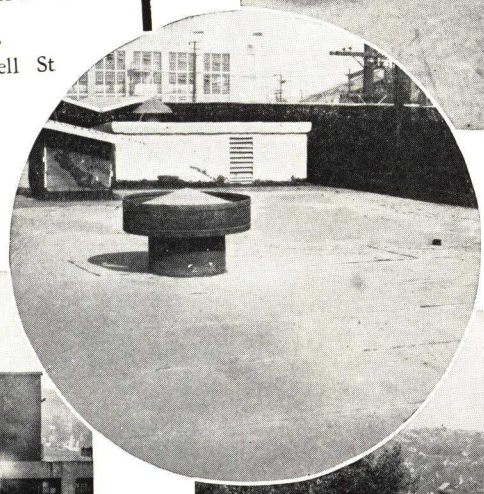
At Seattle, Wash.

The roof of the Bell St Dock, Port of Seattle, is still in good condition, although it was applied as long ago as 1913.

BELOW . . . A 26-YEAR OLD AT DETROIT, MICH.

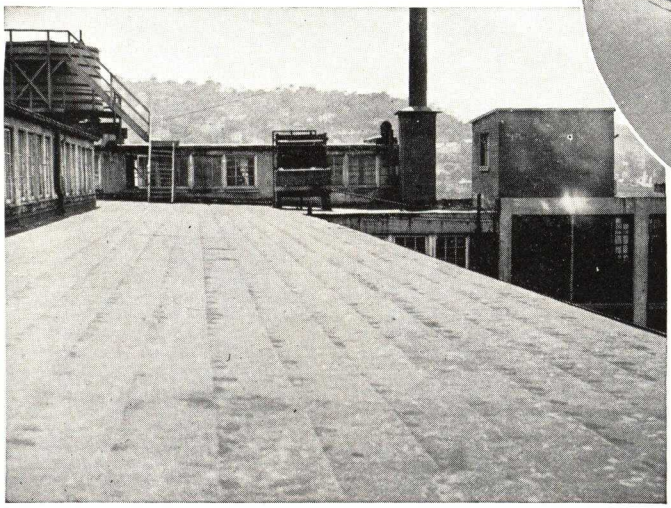
In 1913 a J-M Asbestos Roof was laid for the Enterprise Foundry Company. And now they state, "This roof looks good for many more years."





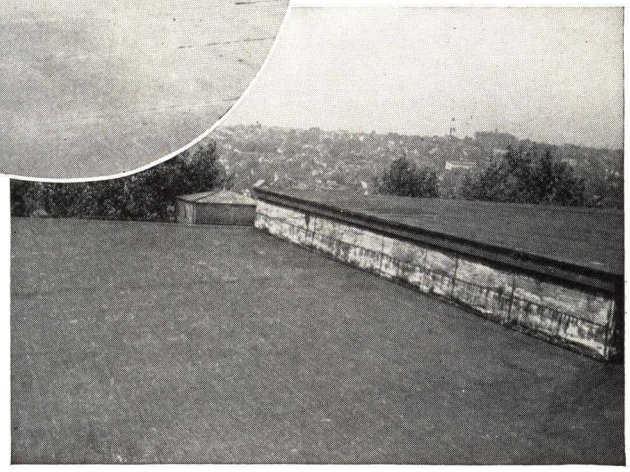
LEFT . . . A 24-YEAR OLD AT LOS ANGELES, CAL.

On March 4, 1915, this J-M roof was laid on the warehouse of the Hauser Packing Company, Division of Armour & Co. "Good for many more years of service."



A 26-YEAR OLD AT CINCINNATI, OHIO

More than a quarter of a century ago, this J-M Smooth-surfaced Asbestos Roof was laid on the buildings of the American Valve and Meter Company. It is still in satisfactory condition.



A 22-YEAR OLD AT SEATTLE, WASH.

Meany Hall, University of Washington, is protected by this J-M Smooth-surfaced Asbestos Roof, still in good condition.

Index and Condensed Specifications for

Pitch of Roof per Foot, in Inches	Bond, Years (See Note)	J-M Specification Number	Page No.	Surface	Number of Plies and Kind of Felt	Number of Moppings Asphalt [A] or Pitch [P]	Weight of Materials, in Pounds per Square: Sheathing Paper	Felts: Asbestos	Felts: Rag	Asphalt	Pitch	Roof Coating	Gravel	Slag	Total Weight per Square, in Pounds: Smooth Surface or Crushed Slate	Gravel Surface	Slag Surface	Underwriters' Rating
WITHOUT INSULATION																		
WOOD DECK ONLY																		
Smooth Surface																		
½ to 6	20	100	10	Smooth	One 55-lb. Asphalt-Saturated Asbestos Felt Three 20-lb. Asphalt-Saturated Asbestos Felts	A-3	—	115	—	90	—	8	—	—	213	—	—	A
½ to 6	15	103	10	Smooth	One 55-lb. Asphalt-Saturated Asbestos Felt Two 20-lb. Asphalt-Saturated Asbestos Felts	A-2	—	95	—	60	—	8	—	—	163	—	—	A
½ to 6	15	200	11	Smooth	One No. 45 Asphalt-Saturated Rag Felt Two 20-lb. Asphalt-Saturated Asbestos Felts	A-2	—	40	50	60	—	8	—	—	158	—	—	—
½ to 6	10	202	11	Smooth	One No. 30 Asphalt-Saturated Rag Felt Two 20-lb. Asphalt-Saturated Asbestos Felts	A-2	—	40	33½	60	—	8	—	—	141½	—	—	—
½ to 6	20	205	△	Smooth	One No. 45 Asphalt-Saturated Rag Felt Three 20-lb. Asphalt-Saturated Asbestos Felts	A-3	—	60	50	90	—	8	—	—	208	—	—	—
Crushed Slate Surface																		
1 to 4	10	402	△	Crushed Slate	Three 15-lb. Asphalt-Saturated Rag Felts Two 50-lb. Asphalt-Saturated Slatekote Felts	A-4	—	—	149	120	—	—	—	—	269	—	—	C
4 to 6	10	400	△	Crushed Slate	Two 15-lb. Asphalt-Saturated Rag Felts Two 50-lb. Asphalt-Saturated Slatekote Felts	A-2	—	—	133	60	—	—	—	—	193	—	—	C
WOOD or PRE-CAST GYPSUM DECK																		
Gravel or Slag Surface																		
½ to 2	20	300	12	Gravel or Slag	Five 15-lb. Asphalt-Saturated Rag Felts	A-4	—	—	81	145	—	—	400	300	—	626	526	A
½ to 2	15	304	12	Gravel or Slag	Four 15-lb. Asphalt-Saturated Rag Felts	A-3	—	—	65	115	—	—	400	300	—	580	480	A
2 to 6	10	301	13	Slag	Five 15-lb. Asphalt-Saturated Rag Felts	A-5	—	—	81	150	—	—	—	250	—	—	481	A*
Not to exceed 2	20	600	**13	Gravel or Slag	One ply Rosin-Sized Paper (over wood only) Five 15-lb. Tar-Saturated Asbestos Felts	P-4	5	81	—	—	150	—	400	300	—	636	536	A
Not to exceed 2	15	604	**14	Gravel or Slag	One ply Rosin-Sized Paper (over wood only) Four 15-lb. Tar-Saturated Asbestos Felts	P-3	5	65	—	—	125	—	400	300	—	595	495	A
2 to 6	10	601	**14	Slag	One ply Rosin-Sized Paper (over wood only) Five 15-lb. Tar-Saturated Asbestos Felts	P-4 A-1	5	81	—	45	60	—	—	250	—	—	441	A*
NON-COMBUSTIBLE DECK (except Steel)																		
Smooth Surface																		
½ to 6	20	101	18	Smooth	One 55-lb. Asphalt-Saturated Asbestos Felt Two 20-lb. Asphalt-Saturated Asbestos Felts	A-3	—	95	—	90	—	8	—	—	193	—	—	A
½ to 6	15	201	18	Smooth	One No. 45 Asphalt-Saturated Rag Felt Two 20-lb. Asphalt-Saturated Asbestos Felts	A-3	—	40	50	90	—	8	—	—	188	—	—	—
½ to 6	10	203	19	Smooth	One No. 30 Asphalt-Saturated Rag Felt Two 20-lb. Asphalt-Saturated Asbestos Felts	A-3	—	40	33⅓	90	—	8	—	—	171½	—	—	—
Smooth Surface under Promenade Tile																		
Not to exceed 1	§	612	**23	Smooth	Five 15-lb, Tar-Saturated Asbestos Felts	P-6	—	81	—	—	200	—	—	—	—	281	—	—
Gravel or Slag Surface																		
½ to 2	20	302	20	Gravel or Slag	Four 15-lb. Asphalt-Saturated Rag Felts	A-5	—	—	65	175	—	—	400	300	—	640	540	A
½ to 2	15	305	21	Gravel or Slag	Three 15-lb. Asphalt-Saturated Rag Felts	A-4	—	—	49	145	—	—	400	300	—	594	494	A
2 to 6	10	303	21	Slag	Four 15-lb. Asphalt-Saturated Rag Felts	A-5	—	—	65	165	—	—	—	250	—	—	480	A*
Not to exceed 2†	20	602	**22	Gravel or Slag	Four 15-lb. Tar-Saturated Asbestos Felts	P-5	—	65	—	—	200	—	400	300	—	665	565	A
Not to exceed 2†	15	605	**22	Gravel or Slag	Three 15-lb. Tar-Saturated Asbestos Felts	P-4	—	49	—	—	150	—	400	300	—	599	499	A
2 to 6‡	10	603	**23	Slag	Four 15-lb. Tar-Saturated Asbestos Felts	P-4 A-1	—	65	—	45	65	—	—	250	—	—	425	A*
Crushed Slate Surface																		
1 to 4	10	403	△	Crushed Slate	Three 15-lb. Asphalt-Saturated Rag Felts Two 50-lb. Asphalt-Saturated Slatekote Felts	A-5	—	—	149	150	—	—	—	—	299	—	—	C
4 to 6	10	401	△	Crushed Slate	One 15-lb. Asphalt-Saturated Rag Felts Two 50-lb. Asphalt-Saturated Slatekote Felts	A-3	—	—	116	90	—	—	—	—	206	—	—	C
			29 to 31	**J-M BASE and CAP FLASHING**														

△ Complete specification not included in this catalog but furnished on request.
* Class A Underwriters' rating on pitches up to and including 3" per foot.
† Not to exceed 2" over Poured Gypsum Decks; not to exceed 1" over Book Tile or Poured or Pre-cast Concrete Decks.
‡ 2" to 6" over Poured Gypsum Decks; 1" to 6" over Poured Concrete Decks.
§ Bond term on application.

**** Available, also, employing rag felt instead of asbestos felt. See note appended to the specification on the page number indicated.**

Note:
No roof bonds are issued on the Pacific Coast.

Johns-Manville Bonded Built-up Roofs

Pitch of Roof per Foot, in Inches	Bond, Years (See Note)	J-M Specification Number	Page No.	Surface	Number of Plies and Kind of Felt	Number of Moppings Asphalt [A] or Pitch [P]	Weight of Materials, in Pounds per Square: Sheathing Paper	Felts: Asbestos	Felts: Rag	Asphalt	Pitch	Roof Coating	Gravel	Slag	Total Weight per Square, in Pounds: Smooth Surface or Crushed Slate	Gravel Surface	Slag Surface	Underwriters' Rating
WITH INSULATION																		
APPLICATION OF INSULATION																		
		500	27	Application of J-M Roofinsul Over Wood Decks														
		501	28	Application of J-M Roofinsul Over Non-Combustible Decks														
		502	28	Application of J-M Roofinsul Over Steel Decks														
WOOD or PRE-CAST GYPSUM DECK																		
Smooth Surface																		
½ to 6	20	104	15	Smooth	Four 20-lb. Asphalt-Saturated Asbestos Felts	A-4	—	80	—	120	—	8	—	—	208	—	—	A
½ to 6	15	106	15	Smooth	Three 20-lb. Asphalt-Saturated Asbestos Felts	A-3	—	60	—	90	—	8	—	—	158	—	—	B
Gravel or Slag Surface																		
¼ to 2	20	302	20	Gravel or Slag	Four 15-lb. Asphalt-Saturated Rag Felts	A-5	—	—	65	175	—	—	400	300	—	640	540	A
¼ to 2	15	305	21	Gravel or Slag	Three 15-lb. Asphalt-Saturated Rag Felts	A-4	—	—	49	145	—	—	400	300	—	594	494	A
2 to 6	10	303	21	Slag	Four 15-lb. Asphalt-Saturated Rag Felts	A-5	—	—	65	165	—	—	—	250	—	—	480	A*
Not to exceed 2	20	606	**16	Gravel or Slag	One Ply Rosin-Sized Paper (over wood only) Four 15-lb. Tar-Saturated Asbestos Felts	P-5	5	65	—	—	175	—	400	300	—	645	545	A
Not to exceed 2	15	608	**17	Gravel or Slag	One Ply Rosin-Sized Paper (over wood only) Three 15-lb. Tar-Saturated Asbestos Felts	P-4	5	49	—	—	150	—	400	300	—	604	504	B
2 to 6	10	610	**17	Slag	One Ply Rosin-Sized Paper (over wood only) Four 15-lb. Tar-Saturated Asbestos Felts	P-3 A-1	5	65	—	45	105	—	—	250	—	—	470	A*
NON-COMBUSTIBLE DECK (except Pre-cast Gypsum or Steel)																		
Smooth Surface																		
½ to 6	20	105	19	Smooth	Four 20-lb. Asphalt-Saturated Asbestos Felts	A-4	—	80	—	120	—	8	—	—	208	—	—	A
½ to 6	15	107	20	Smooth	Three 20-lb. Asphalt-Saturated Asbestos Felts	A-3	—	60	—	90	—	8	—	—	158	—	—	A
Gravel or Slag Surface																		
½ to 2	20	302	20	Gravel or Slag	Four 15-lb. Asphalt-Saturated Rag Felts	A-5	—	—	65	175	—	—	400	300	—	640	540	A
½ to 2	15	305	21	Gravel or Slag	Three 15-lb. Asphalt-Saturated Rag Felts	A-4	—	—	49	145	—	—	400	300	—	594	494	A
2 to 6	10	303	21	Slag	Four 15-lb. Asphalt-Saturated Rag Felts	A-5	—	—	65	165	—	—	—	250	—	—	480	A*
Not to exceed 2□	20	607	**24	Gravel or Slag	Four 15-lb. Tar-Saturated Asbestos Felts	P-5	—	65	—	—	200	—	400	300	—	665	565	A
Not to exceed 2□	15	609	**25	Gravel or Slag	Three 15-lb. Tar-Saturated Asbestos Felts	P-4	—	49	—	—	150	—	400	300	—	599	499	A
2 to 6‡	10	611	**25	Slag	Four 15-lb. Tar-Saturated Asbestos Felts	P-3 A-1	—	65	—	45	94	—	—	250	—	—	454	A*
STEEL DECK																		
Smooth Surface																		
½ to 6	20	108	26	Smooth	Four 20-lb. Asphalt-Saturated Asbestos Felts	A-4	—	80	—	120	—	8	—	—	208	—	—	A
½ to 6	15	109	26	Smooth	Three 20-lb. Asphalt-Saturated Asbestos Felts	A-3	—	60	—	90	—	8	—	—	158	—	—	—
Gravel or Slag Surface																		
½ to 2	20	302	20	Gravel or Slag	Four 15-lb. Asphalt-Saturated Rag Felts	A-5	—	—	65	175	—	—	400	300	—	640	540	A
½ to 2	15	305	21	Gravel or Slag	Three 15-lb. Asphalt-Saturated Rag Felts	A-4	—	—	49	145	—	—	400	300	—	594	494	A
Not to exceed 2□	20	607	**24	Gravel or Slag	Four 15-lb. Tar-Saturated Asbestos Felts	P-5	—	65	—	—	200	—	400	300	—	665	565	A
Not to exceed 2□	15	609	**25	Gravel or Slag	Three 15-lb. Tar-Saturated Asbestos Felts	P-4	—	49	—	—	150	—	400	300	—	599	499	A

* Class A Underwriters' rating on pitches up to and including 3" per foot.
□ Not to exceed 2" over Poured Gypsum Decks; not to exceed 1" over Poured Concrete Decks.
‡ 2" to 6" over Poured Gypsum Decks; 1" to 6" over Poured Concrete Decks.

**** Available, also, employing rag felt instead of asbestos felt. See note appended to the specification on the page number indicated.**

Note: No roof bonds are issued on the Pacific Coast

SPECIFICATION No. 100

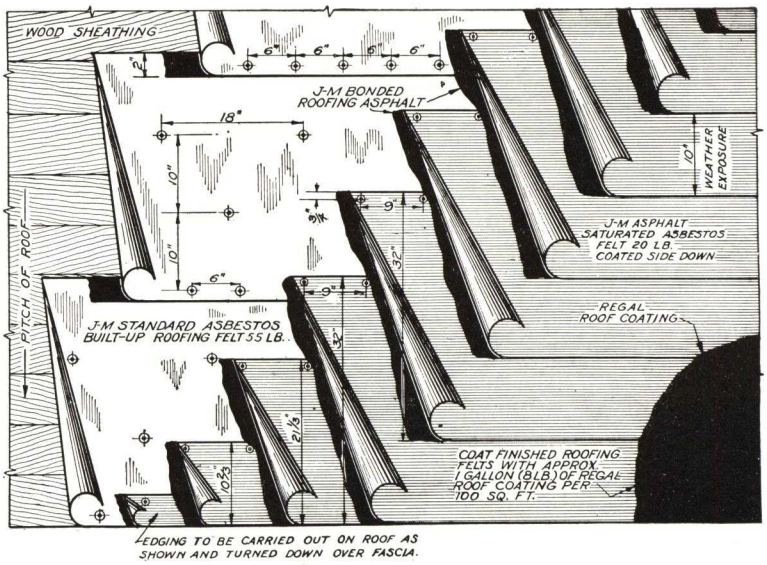
J-M 20-YEAR ROOF OVER WOOD DECKS

Surface: SMOOTH

Felts: ASBESTOS

Waterproofing: ASPHALT

Inclines: ½ in. to 6 inches per foot



BILL OF MATERIALS PER 100 SQ. FT.

BASE FELT:	1 layer of J-M Standard Asbestos Built-up Roofing Felt.	55 lb.
FINISHING FELTS:	3 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	60 lb.
ASPHALT:	J-M Bonded Roofing Asphalt	90 lb.
ROOF COATING:	J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—If the pitch of the roof is 3″ to the foot or less, the 55-lb. asbestos felt may be laid either paralleling, or at right angles to, the pitch. The 20-lb. asbestos felts shall be laid at right angles to the pitch. If the pitch of the roof is over 3″ to the foot, all felts shall be laid parallel to the pitch. All felts shall be turned up 2″ on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—Lay one thickness of the 55-lb. asbestos felt, lapping the sheets 2″, sealing the laps with the asphalt and nailing at 6″ centers through the laps and at 18″ centers through the longitudinal center of each sheet, in two lines spaced 10″ apart, the nails to be staggered.

Over the 55-lb. asbestos felt, lay three plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 22″ over the preceding one, mopping the full width under each with the asphalt and nailing at 9″ centers adjacent to the back edge.

Coat the entire surface with the roof coating.

Flashing—*(Copy from J-M Standard Specification for Flashing, page 29.)*

(If a bond is required, add the following:)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

SPECIFICATION No. 103

J-M 15-YEAR ROOF OVER WOOD DECKS

Surface: SMOOTH **Waterproofing: ASPHALT**

Felts: ASBESTOS **Inclines: ½ in. to 6 in. per ft.**

BILL OF MATERIALS PER 100 SQ. FT.

BASE FELT:	1 layer of J-M Standard Asbestos Built-up Roofing Felt	55 lb.
FINISHING FELTS:	2 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	40 lb.
ASPHALT:	J-M Bonded Roofing Asphalt	60 lb.
ROOF COATING:	J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—If the pitch of the roof is 3″ to the foot or less, the 55-lb. asbestos felt may be laid either paralleling, or at right angles to, the pitch. The 20-lb. asbestos felts shall be laid at right angles to the pitch. If the pitch of the roof is over 3″ to the foot, all felts shall be laid parallel to the pitch. All felts shall be turned up 2″ on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—Lay one thickness of the 55-lb. asbestos felt, lapping the sheets 2″, sealing the laps with the asphalt and nailing at 6″ centers through the laps and at 18″ centers through the longitudinal center of each sheet, in two lines spaced 10″ apart, the nails to be staggered.

Over the 55-lb. asbestos felt, lay two plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 17″ over the preceding one, mopping the full width under each with the asphalt and nailing at 9″ centers adjacent to the back edge.

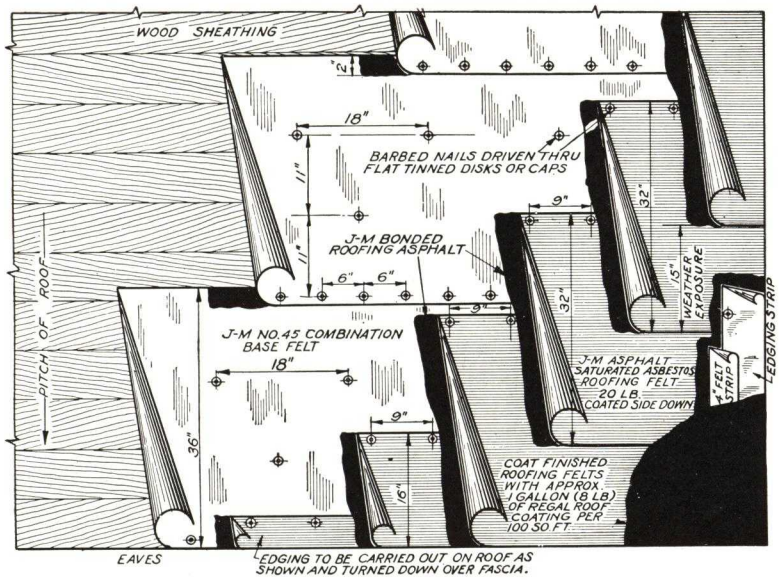
Coat the entire surface with the roof coating.

Flashing—*(Copy from J-M Standard Specification for Flashing, page 29.)*

(If a bond is required, add the following:)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Fifteen-Year Guaranty Bond.



SPECIFICATION No. 200

J-M 15-YEAR ROOF OVER WOOD DECKS

Surface: SMOOTH

Felts: ASBESTOS and RAG

Waterproofing: ASPHALT

Inclines: ½ in. to 6 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

BASE FELT: 1 layer of J-M No. 45 Base Felt (Rag Felt, 50 lbs. per 108 sq. ft.)	50 lb.
FINISHING FELTS: 2 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	40 lb.
ASPHALT: J-M Bonded Roofing Asphalt	60 lb.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—If the pitch of the roof is 3" to the foot or less, the 50-lb. rag felt may be laid either paralleling, or at right angles to, the pitch. The 20-lb. asbestos felts shall be laid at right angles to the pitch. If the pitch of the roof is over 3" to the foot, all felts shall be laid parallel to the pitch. All felts shall be turned up 2" on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—Lay one thickness of the 50-lb. rag felt, lapping the sheets 2", sealing the laps with the asphalt and nailing at 6" centers through the laps and at 18" centers through the longitudinal center of each sheet in two lines spaced 11" apart, the nails to be staggered.

Over the 50-lb. rag felt, lay two plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 17" over the preceding one, mopping the full width under each with the asphalt and nailing at 9" centers adjacent to the back edge.

Coat the entire surface with the roof coating.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Fifteen-Year Guaranty Bond.

SPECIFICATION No. 202

J-M 10-YEAR ROOF OVER WOOD DECKS

Surface: SMOOTH **Felts: ASBESTOS and RAG**

Waterproofing: ASPHALT

Inclines: ½ in. to 6 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

BASE FELT: 1 layer of J-M No. 30 Combination Base Felt (Rag Felt, 33½ lbs. per 108 sq. ft.)	33½ lb.
FINISHING FELTS: 2 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	40 lb.
ASPHALT: J-M Bonded Roofing Asphalt	60 lb.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—If the pitch of the roof is 3" to the foot or less, the 33½-lb. rag felt may be laid either paralleling, or at right angles to, the pitch. The 20-lb. asbestos felts shall be laid at right angles to the pitch. If the pitch of the roof is over 3" to the foot, all felts shall be laid parallel to the pitch. All felts shall be turned up 2" on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—Lay one thickness of the 33½-lb. rag felt, lapping the sheets 2", sealing the laps with the asphalt and nailing at 6" centers through the laps and at 18" centers through the longitudinal center of each sheet in two lines spaced 11" apart, the nails to be staggered.

Over the 33½-lb. rag felt, lay two plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 17" over the preceding one, mopping the full width under each with the asphalt and nailing at 9" centers adjacent to the back edge.

Coat the entire surface with the roof coating.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Ten-Year Guaranty Bond.

SPECIFICATION No. 300

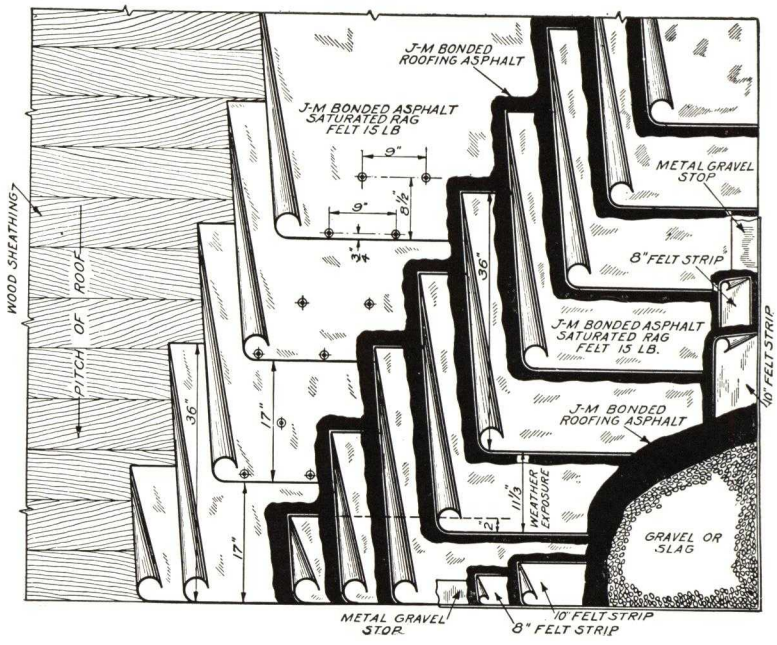
J-M 20-YEAR ROOF OVER WOOD OR PRE-CAST GYPSUM DECKS

Surface: SLAG or GRAVEL

Felts: RAG

Waterproofing: ASPHALT

Inclines: ½ in. to 2 inches per foot



BILL OF MATERIALS PER 100 SQ. FT.

FELTS:	5 layers of J-M 15-lb. Bonded Asphalt-Saturated Rag Felt (16¼ lb. per 108 sq. ft.)	81 lb.
ASPHALT:	J-M Bonded Roofing Asphalt	145 lb.
SURFACING:	Gravel	400 lb.
	or Slag	300 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All roofing felts shall be turned up 2″ on all vertical surfaces without cementing thereto. All nails shall be driven through flat metal disks.

Roofing—Lay two plies of the 15-lb. rag felt, lapping each sheet 19″ over the preceding one and nailing through the laps in two lines spaced 7¾″ apart, the first line to adjoin the edge of the sheet, the nails to be spaced at 9″ centers and staggered.

Over these felts lay three additional plies of the 15-lb. rag felt, lapping each sheet 24⅔″ over the preceding one, mopping the full width under each with the asphalt.

Over the entire surface pour a uniform coating of the asphalt and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

SPECIFICATION No. 304

J-M 15-YEAR ROOF OVER WOOD OR PRE-CAST GYPSUM DECKS

Surface: SLAG or GRAVEL Felts: RAG

Waterproofing: ASPHALT

Inclines: ½ in. to 2 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

FELTS:	4 layers of J-M 15-lb. Bonded Asphalt-Saturated Rag Felt (16¼ lb. per 108 sq. ft.)	65 lb.
ASPHALT:	J-M Bonded Roofing Asphalt	115 lb.
SURFACING:	Gravel	400 lb.
	or Slag	300 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All roofing felts shall be turned up 2″ on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—Lay two plies of the 15-lb. rag felt, lapping each sheet 19″ over the preceding one and nailing through the laps in two lines spaced 7¾″ apart, the first line to adjoin the edge of the sheet, the nails to be spaced at 9″ centers and staggered.

Over these felts lay two additional plies of the 15-lb. rag felt, lapping each sheet 19″ over the preceding one, mopping the full width under each with the asphalt.

Over the entire surface pour a uniform coating of the asphalt and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Fifteen-Year Guaranty Bond.

SPECIFICATION No. 301

J-M 10-YEAR ROOF OVER WOOD OR PRE-CAST GYPSUM DECKS

Surface: SLAG **Waterproofing: ASPHALT**

Felts: RAG **Inclines: 2 in. to 6 in. per ft.**

BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 5 layers of J-M 15-lb. Bonded Asphalt-Saturated Rag Felt (16¼ lb. per 108 sq. ft.)	81 lb.
ASPHALT: J-M Bonded Roofing Asphalt	150 lb.
SURFACING: Slag	250 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All roofing felts shall be turned up 2″ on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—Lay five plies of the 15-lb. rag felt, lapping each sheet 29 1/5″ over the preceding one, mopping between plies with the asphalt to within 4″ of the back edge of the underlying felt and nailing at 12″ centers, 10″ from the back edge.

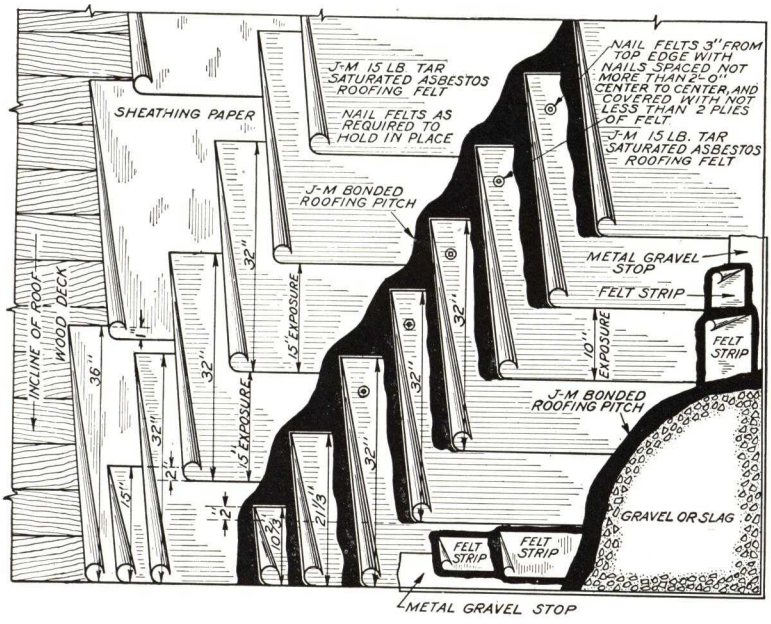
Over the entire surface pour a uniform coating of the asphalt and embed therein, while hot, not less than 250 lbs. of slag for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.*)

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Ten-Year Guaranty Bond.



BILL OF MATERIALS PER 100 SQ. FT.

SHEATHING PAPER (used on wood deck only): 1 layer (5 lb. per 100 sq. ft.)	5 lb.
***FELTS:** 5 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	81 lb.
PITCH: J-M Bonded Roofing Pitch	150 lb.
SURFACING: Gravel	400 lb.
or Slag	300 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All roofing felts shall be turned up 2″ on all vertical masonry surfaces and 4″ on all vertical wood surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

SPECIFICATION No. 600*

J-M 20-YEAR ROOF OVER WOOD OR PRE-CAST GYPSUM DECKS

Surface: SLAG or GRAVEL

Felts: ASBESTOS

Waterproofing: PITCH (TAR)

Inclines: Not to exceed 2 inches per foot

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 700

Felts: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

Roofing—If application is over wood sheathing, lay one thickness of sheathing paper, lapping the sheets not less than 1″.

Lay two plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 17″ over the preceding one and nailing sufficiently to hold in place.

Over these felts lay three additional plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 22″ over the preceding one, mopping the full width under each with the pitch and nailing at 24″ centers, 3″ from the back edge.

Over the entire surface pour a uniform coating of the pitch and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

SPECIFICATION No. 604*

J-M 15-YEAR ROOF OVER WOOD OR PRE-CAST GYPSUM DECKS

Surface: SLAG or GRAVEL

Felts: ASBESTOS

Waterproofing: PITCH (TAR)

Inclines: Not to exceed 2 inches per foot

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 704

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

BILL OF MATERIALS PER 100 SQ. FT.

SHEATHING PAPER (used on wood deck only): 1 layer (5 lb. per 100 sq. ft.)	5 lb.
***FELTS:** 4 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	65 lb.
PITCH: J-M Bonded Roofing Pitch	125 lb.
SURFACING: Gravel	400 lb.
or Slag	300 lb.

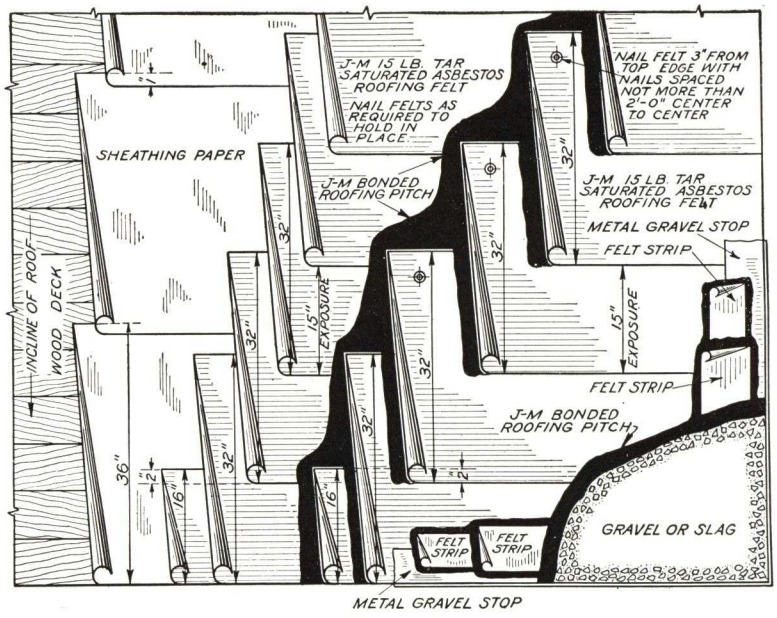
ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All roofing felts shall be turned up 2″ on all vertical masonry surfaces and 4″ on all vertical wood surfaces without being cemented thereto. All nails shall be driven through flat metal disks.



Roofing—If application is over wood sheathing, lay one thickness of sheathing paper, lapping the sheets not less than 1″.

Lay two plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 17″ over the preceding one and nailing sufficiently to hold in place.

Over these felts lay two additional plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 17″ over the preceding one, mopping the full width under each with the pitch and nailing at 24″ centers, 3″ from the back edge.

Over the entire surface pour a uniform coating of the pitch and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Fifteen-Year Guaranty Bond.

SPECIFICATION No. 601*

J-M 10-YEAR ROOF OVER WOOD OR PRE-CAST GYPSUM DECKS

Surface: SLAG **Waterproofing: PITCH (TAR)**

Felts: ASBESTOS **Inclines: 2 in. to 6 in. per ft.**

BILL OF MATERIALS PER 100 SQ. FT.

SHEATHING PAPER (used on wood deck only): 1 layer (5 lb. per 100 sq. ft.)	5 lb.
***FELTS:** 5 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	81 lb.
PITCH: J-M Bonded Roofing Pitch (for mopping between felts)	60 lb.
ASPHALT: J-M Bonded Roofing Asphalt (for top surfacing)	45 lb.
SURFACING: Slag	250 lb.

ROOF DECK

(*Copy from Specification No. 604, above.*)

INSTALLATION

General—(*copy from Specification No. 604, above.*)

Roofing—If application is over wood sheathing, lay one thickness of sheathing paper, lapping the sheets not less than 1″.

Lay five plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 26″ over the preceding one, mopping under each with the pitch to a width of 18″ starting 2″ from the exposed edge. Nail each sheet at 12″ centers, 10″ from the back edge.

Over the entire surface pour a uniform coating of the asphalt and embed therein, while hot, not less than 250 lbs. of slag for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

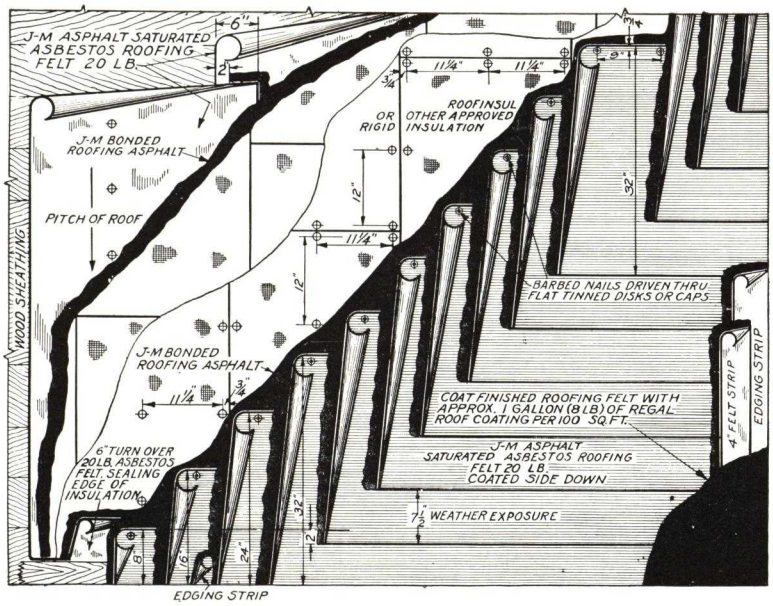
GUARANTEE

(*Copy from Specification No. 604, above, except change to* "Ten-Year.")

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 701

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")



SPECIFICATION No. 104

J-M 20-YEAR ROOF OVER INSULATION ON WOOD DECKS

Surface: SMOOTH

Felts: ASBESTOS

Waterproofing: ASPHALT

Insulation: ROOFINSUL

Inclines: ½ in. to 6 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 4 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	80 lb.
(An additional ply of 20-lb. Asbestos Felt is specified for application under the insulation, in Specification No. 500. See page 27.)	
ASPHALT: J-M Bonded Roofing Asphalt (for mopping between felts)	120 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick)	
For each layer of insulation	100 sq. ft.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—If the pitch of the roof is 3" to the foot or less, the felts shall be laid at right angles to the pitch. If the pitch of the roof is over 3" to the foot, the felts shall be laid parallel to the pitch. The roof felts shall be turned up 2" on all vertical surfaces without being cemented thereto. The felt applied under insulation shall be similarly turned up a distance 6" greater than the thickness of such insulation and shall overhang all roof edges a similar amount. All nails shall be driven through flat metal disks.

Insulation—(*Copy from J-M Standard Specification No. 500, page 27.)*

Roofing—Lay four plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 24½" over the preceding one, mopping the full width under each with the asphalt and, if pitch of roof exceeds 3" to the foot, nailing at 9" centers adjacent to the back edge.

Coat the entire surface with roof coating.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.*)

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

SPECIFICATION No. 106

J-M 15-YEAR ROOF OVER INSULATION ON WOOD DECKS

Surface: SMOOTH **Waterproofing: ASPHALT**

Felts: ASBESTOS **Insulation: ROOFINSUL**

Inclines: ½ in. to 6 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 3 layers of J-M 20-lb. Asbestos Roofing Felt	60 lb.
(An additional ply of 20-lb. Asbestos Felt is specified for application under the insulation, in Specification No. 500. See page 27.)	
ASPHALT: J-M Bonded Roofing Asphalt (for mopping between felts)	90 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick)	
For each layer of insulation	100 sq. ft.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(*Copy from Specification No. 104, above.*)

INSTALLATION

General—(*Copy from Specification No. 104, above.*)

Insulation—(*Copy from J-M Standard Specification No. 500, page 27.)*

Roofing—Lay three plies of the 20-lb. asbestos felt, lapping each sheet 22" over the preceding one, mopping the full width under each with the asphalt and, if pitch of roof exceeds 3" to the foot, nailing at 9" centers adjacent to the back edge.

Coat the entire surface with the roof coating.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

(*Copy from Specification No. 104, above, except change to* "Fifteen-Year".)

SPECIFICATION No. 606*

J-M 20-YEAR ROOF OVER INSULATION ON WOOD OR PRE-CAST GYPSUM DECKS

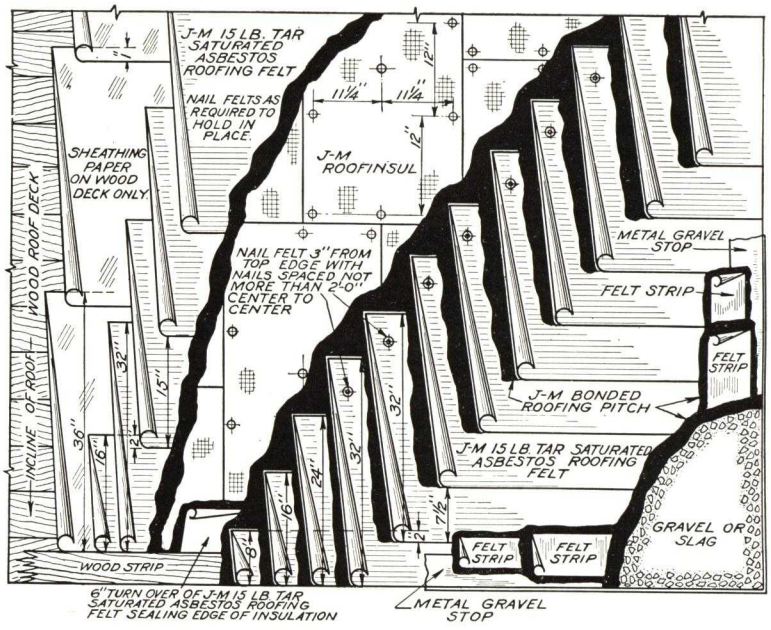
Surface: SLAG or GRAVEL

Felts: ASBESTOS

Waterproofing: PITCH (TAR)

Insulation: ROOFINSUL

Inclines: Not to exceed 2 inches per foot



BILL OF MATERIALS PER 100 SQ. FT.

SHEATHING PAPER (used over wood deck only): 1 layer (5 lb. per 100 sq. ft.)	5 lb.
***FELTS: (Under Insulation)** 2 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	32½ lb.
***FELTS: (For Built-Up Roof)** 4 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	65 lb.
PITCH: J-M Bonded Roofing Pitch (for mopping between felts)	175 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick) For each layer of insulation	100 sq. ft.
SURFACING: Gravel	400 lb.
or Slag	300 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in a satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All felts applied over the insulation shall be turned up 2" on all vertical masonry surfaces and 4" on all vertical wood surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Felts Under Insulation—If application is over wood sheathing, lay one thickness of sheathing paper, lapping the sheets not less than 1".

Lay two plies of the 15-lb. tar-saturated felt, lapping each sheet 17" over the preceding one and nailing sufficiently to hold in place. These felts shall be turned up on, but not cemented to, all vertical surfaces to a height 6" greater than the thickness of the insulation and shall overhang all roof edges a similar amount.

Insulation—Lay the Roofinsul with the rough side down and with all end joints broken, mopping the full width under each sheet with the pitch. The edges of the sheets at the joints shall be thoroughly sealed with the pitch. The insulation shall be isolated into areas approximately 30' 0" square by path-strippings of one ply of the 15-lb. tar-saturated roofing felt, mopped the full width with the pitch, to extend not less than 4" over the edge of the insulation in place and not less than 4" under the adjoining insulation to be laid. Nail each sheet of the insulation at 12" centers adjacent to the longitudinal edges and staggered through the longitudinal center.

If the insulation is to be applied in more than one layer, succeeding layers shall be applied in the same manner as the first layer (*unless high humidity and condensation conditions do not exist, in which event the moppings between layers may be omitted*), the sheets of each layer to break joints with those of the preceding layer, with all nailing done through the top layer.

The upturned felt at vertical surfaces and roof edges shall be turned down and mopped solidly to the insulation.

Insulation shall not be left exposed to the weather. No more insulation shall be laid down than can be completely covered with the roofing felts on the same day. At the end of the day's work, roofing felts shall be turned down over the exposed edges of the insulation and mopped solidly.

Roofing—Lay four plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 24½" over the preceding one, mopping the full width under each with the pitch and nailing at 24" centers, 3" from the back edge.

Over the entire surface pour a uniform coating of the pitch and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

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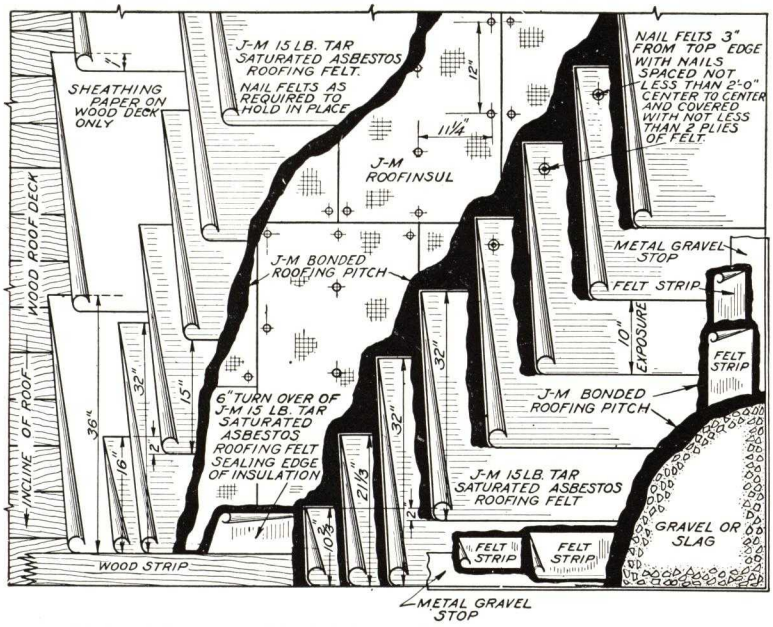
*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 706

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")



BILL OF MATERIALS PER 100 SQ. FT.

SHEATHING PAPER (used over wood deck only): 1 layer (5 lb. per 108 sq. ft.)	5 lb.
***FELTS: (Under Insulation)** 2 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	32½ lb.
***FELTS: (For Built-Up Roof)** 3 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	49 lb.
PITCH: J-M Bonded Roofing Pitch (for mopping between felts)	150 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick) For each layer of insulation	100 sq. ft.
SURFACING: Gravel	400 lb.
or Slag	300 lb.

ROOF DECK

(*Copy from Specification No. 606, opposite.*)

INSTALLATION

General—(*Copy from Specification No. 606, opposite.*)

Felts Under Insulation—(*Copy from Specification No. 606, opposite.)*

Insulation—(*Copy from Specification No. 606, opposite.*)

Roofing—Lay three plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 22" over the preceding one, mopping the full width under each with the pitch and nailing at 24" centers, 3" from the back edge.

Over the entire surface pour a uniform coating of the pitch and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

(*Copy from Specification No. 606, opposite, except change to* "Fifteen-Year.")

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 708

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

SPECIFICATION No. 610*

J-M 10-YEAR ROOF OVER INSULATION ON WOOD OR PRE-CAST GYPSUM DECKS

Surface: SLAG **Waterproofing: PITCH (TAR)**

Felts: ASBESTOS **Insulation: ROOFINSUL**

Inclines: 2 in. to 6 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

SHEATHING PAPER (used over wood deck only): 1 layer (5 lb. per 108 sq. ft.)	5 lb.
***FELTS: (Under Insulation)** 2 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	32½ lb.
***FELTS: (For Built-Up Roofs)** 4 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	65 lb.
PITCH: J-M Bonded Roofing Pitch (for mopping between felts)	105 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
ASPHALT: J-M Bonded Roofing Asphalt (for top surfacing)	45 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick) For each layer of insulation	100 sq. ft.
SURFACING: Slag	250 lb.

ROOF DECK

(*Copy from Specification No. 606, opposite.*)

INSTALLATION

General—(*Copy from Specification No. 606, opposite.*)

Felts Under Insulation—(*Copy from Specification No. 606, opposite.)*

Insulation—(*Copy from Specification No. 606, opposite.*)

Roofing—Lay four plies of the 15-lb. tar-saturated felt, lapping each sheet 24½" over the preceding one, mopping under each with the pitch to a width of 30" starting 2" from the exposed edge. Nail each sheet at 12" centers, 10" from the back edge.

Over the entire surface pour a uniform coating of the asphalt and embed therein, while hot, not less than 250 lbs. of slag for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

(*Copy from Specification No. 606, opposite, except change to* "Ten-Year".)

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 710

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

SPECIFICATION No. 101

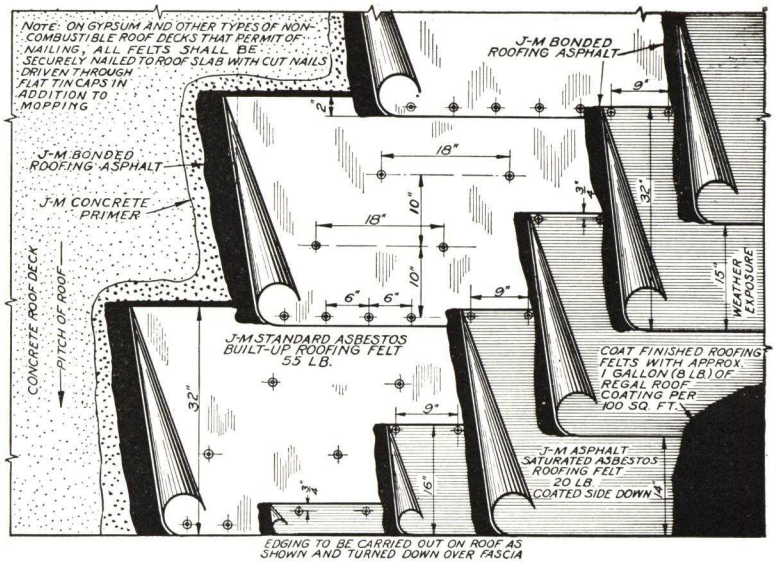
J-M 20-YEAR ROOF OVER NON-COMBUSTIBLE DECKS

Surface: SMOOTH

Felts: ASBESTOS

Waterproofing: ASPHALT

Inclines: 1/2 in. to 6 inches per foot



BILL OF MATERIALS PER 100 SQ. FT.

BASE FELT: 1 layer of J-M Standard Asbestos Built-Up Roofing Felt	55 lb.
FINISHING FELTS: 2 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	40 lb.
PRIMER: J-M Concrete Primer (8 lb. per gal.):	
Over Concrete	1 gal.
Over Gypsum	1 1/2 to 2 gal.
ASPHALT: J-M Bonded Roofing Asphalt	90 lb.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—If the pitch of the roof is 3" to the foot or less, the 55-lb. asbestos felt may be laid either paralleling, or at right angles to, the pitch. The 20-lb. asbestos felts shall be laid at right angles to the pitch. If the pitch of the roof is over 3" to the foot, all felts shall be laid parallel to the pitch. All felts shall be turned up 2" on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—Coat all surfaces, which are to receive the roofing, with the primer and allow to dry.

Lay one thickness of the 55-lb. asbestos felt, lapping the sheets 2", mopping the full width under each with the asphalt and, if roof construction permits, nailing at 6" centers through the laps and at 18" centers through the longitudinal center of each sheet in two lines spaced 10" apart, the nails to be staggered.

Over the 55-lb. asbestos felt, lay two plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 17" over the preceding one, mopping the full width under each with the asphalt and, if roof construction permits, nailing at 9" centers adjacent to the back edge.

If deck is composed of precast units, the primer and asphalt shall be omitted 4" each side of all joints.

With nailing strips provided as required, nail each sheet of the 55-lb. asbestos felt at 6" centers at each nailing strip. Nail each sheet of the 20-lb. asbestos felt at each nailing strip 3/4" from the back edge.

Coat the entire surface with the roof coating.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

SPECIFICATION No. 201

J-M 15-YEAR ROOF OVER NON-COMBUSTIBLE DECKS

Surface: SMOOTH — Waterproofing: ASPHALT

Felts: RAG — Inclines: 1/2 in. to 6 ins. per ft.

BILL OF MATERIALS PER 100 SQ. FT.

BASE FELT: 1 layer of J-M No. 45 Base Felt (Rag Felt, 50 lb. per 108 sq. ft.)	50 lb.
FINISHING FELTS: 2 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	40 lb.
PRIMER: J-M Concrete Primer (8 lb. per gal.):	
Over Concrete	1 gal.
Over Gypsum	1 1/2 to 2 gal.
ASPHALT: J-M Bonded Roofing Asphalt	90 lb.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—(*Copy from Specification No. 101, above, changing* "55-lb. asbestos felt" *to* "50-lb. rag felt.")

Roofing—(*Copy from Specification No. 101, above, changing* "55-lb. asbestos felt" *to* "50-lb. rag felt," *and changing the spacing of the nails from* 10" *to* 11".)

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Fifteen-Year Guaranty Bond.

SPECIFICATION No. 203

J-M 10-YEAR ROOF OVER NON-COMBUSTIBLE DECKS

Surface: SMOOTH **Felts: ASBESTOS and RAG**

Waterproofing: ASPHALT

Inclines: ½ in. to 6 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

BASE FELT: 1 layer of J-M No. 30 Combination Base Felt (Rag Felt, 33½ lb. per 108 sq. ft.) ..... 33½ lb.
FINISHING FELTS: 2 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt ..... 40 lb.
PRIMER: J-M Concrete Primer (8 lb. per gal.):
Over Concrete ..... 1 gal.
Over Gypsum ..... 1½ to 2 gal.
ASPHALT: J-M Bonded Roofing Asphalt ..... 90 lb.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.) 1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—(*Copy from Specification No. 101, opposite, changing* "55-lb. asbestos felt" *to* "33½-lb. rag felt.")

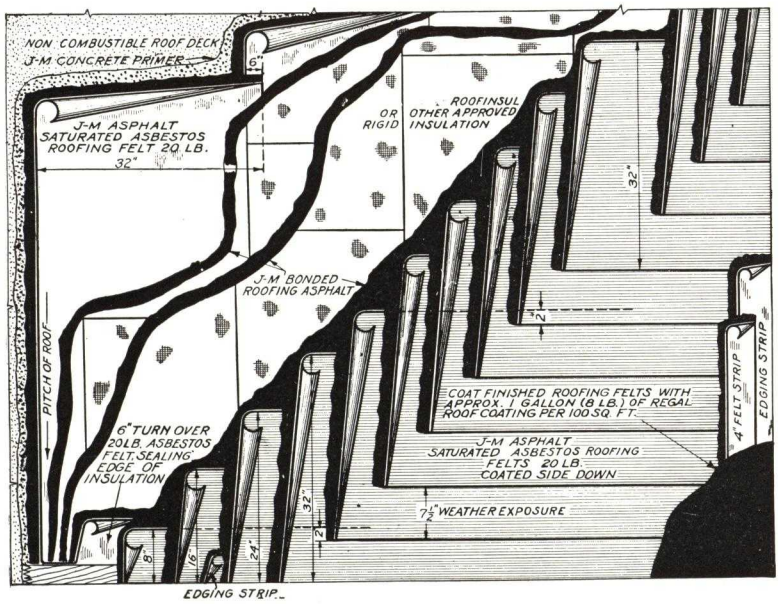
Roofing—(*Copy from Specification No. 101, opposite, changing* "55-lb. asbestos felt" *to* "33½-lb. rag felt," *and changing the spacing of the nails from* 10" *to* 11".)

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(If a bond is required, add the following:)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Ten-Year Bond.



SPECIFICATION No. 105

J-M 20-YEAR ROOF OVER INSULATION ON NON-COMBUSTIBLE DECKS

Surface: SMOOTH

Felts: ASBESTOS

Waterproofing: ASPHALT

Insulation: ROOFINSUL

Inclines: ½ in. to 6 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 4 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt ..... 80 lb.
(An additional ply of 20-lb. Asbestos Felt is specified for application under the insulation, in Specification No. 501. See page 28.)
ASPHALT: J-M Bonded Roofing Asphalt (for mopping between felts) ..... 120 lb.
For mopping felt to deck ..... 30 lb.
For mopping insulation over felt ..... 30 lb.
For mopping each additional ply of insulation ..... 30 lb.
PRIMER: J-M Concrete Primer (8 lb. per gal.):
Over Concrete ..... 1 gal.
Over Gypsum ..... 1½ to 2 gal.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick)
For each layer of insulation ..... 100 sq. ft.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.) 1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—If the pitch of the roof is 3" to the foot or less, the felts shall be laid at right angles to the pitch. If the pitch of the roof is over 3" to the foot, the felts shall be laid parallel to the pitch. The roof felts shall be turned up 2" on all vertical surfaces without being cemented thereto. The felt applied under insulation shall be similarly turned up a distance 6" greater than the thickness of such insulation and shall overhang all roof edges a similar amount. All nails shall be driven through flat metal disks.

Insulation—(*Copy from J-M Standard Specification No. 501, page 28.*)

Roofing—Lay four plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 24½" over the preceding one, mopping the full width under each with the asphalt.

If pitch of roof exceeds 3" to the foot, and roof construction permits, each sheet shall be nailed at 9" centers adjacent to the back edge. With nailing strips provided as required, nail each sheet at each nailing strip, all nails to be placed so as to be covered by not less than two plies of felt.

Coat the entire surface with the roof coating.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 28.)*

(If a bond is required, add the following:)

GUARANTEE

(*Copy from Specification No. 101, opposite.*)

SPECIFICATION No. 107

J-M 15-YEAR ROOF OVER INSULATION ON NON-COMBUSTIBLE DECKS

Surface: SMOOTH **Waterproofing: ASPHALT**
Felts: ASBESTOS **Insulation: ROOFINSUL**
Inclines: ½ in. to 6 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 3 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	60 lb.
(An additional ply of 20-lb. Asbestos Felt is specified for application under the insulation, in Specification No. 501. See page 28.)	
ASPHALT: J-M Bonded Roofing Asphalt (for mopping between felts)	90 lb.
For mopping felt to deck	30 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
PRIMER: J-M Concrete Primer (8 lb. per gal.):	
Over Concrete	1 gal.
Over Gypsum	1½ to 2 gal.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick)	
For each layer of insulation	100 sq. ft.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—If the pitch of the roof is 3" to the foot or less, the felts shall be laid at right angles to the pitch. If the pitch of the roof is over 3" to the foot, the felts shall be laid parallel to the pitch. The roof felts shall be turned up 2" on all vertical surfaces without being cemented thereto. The felt applied under insulation shall be similarly turned up a distance 6" greater than the thickness of such insulation and shall overhang all roof edges a similar amount. All nails shall be driven through flat metal disks.

Insulation—(*Copy from J-M Specification No. 501, page 28.*)

Roofing—Lay three plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 22" over the preceding one, mopping the full width under each with the asphalt.

If pitch of roof exceeds 3" to the foot, and roof construction permits, each sheet shall be nailed at 9" centers adjacent to the back edge. With nailing strips provided as required, nail each sheet at each nailing strip, all nails to be so placed as to be covered by not less than two plies of felt.

Coat the entire surface with the roof coating.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(If a bond is required, add the following:)

GUARANTEE

(*Copy from Specification No. 305, opposite.*)

SPECIFICATION No. 302

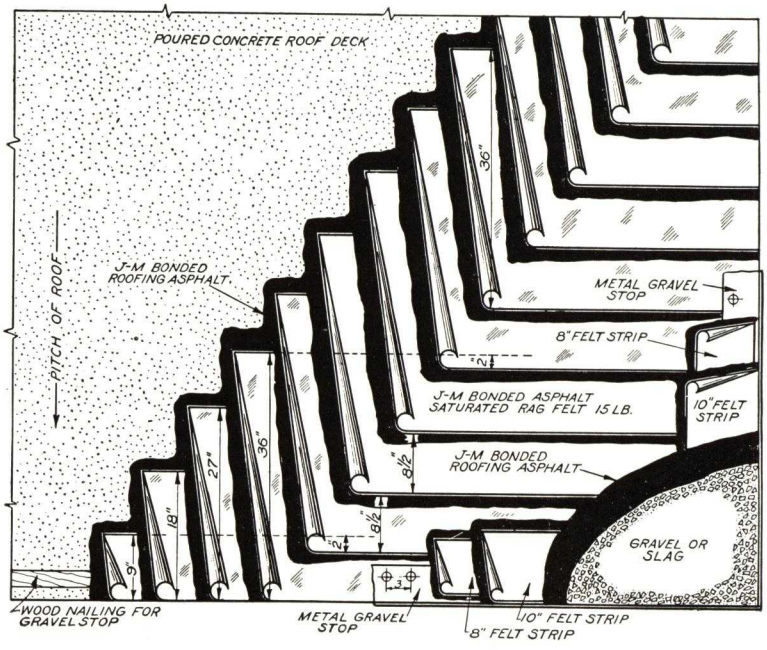
J-M 20-YEAR ROOF OVER BOOK TILE, POURED OR PRECAST CONCRETE OR POURED GYPSUM DECKS

Surface: SLAG or GRAVEL

Felts: RAG

Waterproofing: ASPHALT

Inclines: ½ in. to 2 inches per foot



BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 4 layers of J-M 15-lb. Bonded Asphalt-Saturated Rag Felt (16¼ lb. per 108 sq. ft.)	65 lb.
PRIMER: J-M Concrete Primer (8 lb. per gal.):	
Over Concrete	1 gal.
Over Gypsum	1½ to 2 gal.
ASPHALT: J-M Bonded Roofing Asphalt	175 lb.
SURFACING: Gravel	400 lb.
or Slag	300 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All roofing felts shall be turned up 2" on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—If application is over gypsum, coat all surfaces, which are to receive the roofing, with the primer and allow to dry.

Lay four plies of the 15-lb. rag felt, lapping each sheet 27½" over the preceding one, mopping the full width under each with the asphalt and, if roof construction permits, nailing at 12" centers, 3" from the back edge.

If deck is composed of precast units, the primer and asphalt shall be omitted 4" each side of all joints.

Over the entire surface pour a uniform coating of the asphalt and

embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

SPECIFICATION No. 305

J-M 15-YEAR ROOF OVER BOOK TILE, POURED OR PRECAST CONCRETE OR POURED GYPSUM DECKS

Surface: SLAG and GRAVEL **Felts: RAG**

Waterproofing: ASPHALT

Inclines: ½ in. to 2 inches per foot

BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 3 layers of J-M 15-lb. Bonded Asphalt-Saturated Rag Felt (16¼ lb. per 108 sq. ft.)	49 lb.
PRIMER: J-M Concrete Primer (8 lb. per gal.):	
Over Concrete	1 gal.
Over Gypsum	1½ to 2 gal.
ASPHALT: J-M Bonded Roofing Asphalt	145 lb.
SURFACING: Gravel	400 lb.
or Slag	300 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General— All roofing felts shall be turned up 2″ on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—If application is over gypsum, coat all surfaces, which are to receive the roofing, with the primer and allow to dry.

Lay three plies of the 15-lb. rag felt, lapping each sheet 24⅔″ over the preceding one, mopping the full width under each with the asphalt and, if roof construction permits, nailing at 12″ centers, 3″ from the back edge.

If deck is composed of precast units, the primer and asphalt shall be omitted 4″ each side of all joints.

Over the entire surface pour a uniform coating of the asphalt and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(If a bond is required, add the following:)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Fifteen-Year Guaranty Bond.

SPECIFICATION No. 303

J-M 10-YEAR ROOF OVER POURED OR PRECAST CONCRETE OR POURED GYPSUM DECKS

Surface: SLAG **Waterproofing: ASPHALT**

Felts: RAG **Inclines: 2 in. to 6 inches per foot**

BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 4 layers of J-M 15-lb. Bonded Asphalt-Saturated Rag Felt (16¼ lb. per 108 sq. ft.)	65 lb.
PRIMER: J-M Concrete Primer (8 lbs. per gal.):	
Over Concrete	1 gal.
Over Gypsum	1½ to 2 gal.
ASPHALT: J-M Bonded Roofing Asphalt	165 lb.
SURFACING: Slag	250 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All roofing felts shall be turned up 2″ on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—If application is over gypsum, coat all surfaces, which are to receive the roofing, with the primer and allow to dry.

Lay four plies of the 15-lb. rag felt, lapping each sheet 27½″ over the preceding one, mopping the full width under each with the asphalt and, if roof construction permits, nailing at 12″ centers, 3″ from the back edge.

If deck is composed of precast units, the primer and asphalt shall be omitted 4″ each side of all joints.

With nailing strips provided as required, nail each sheet at each nailing strip with two nails spaced 8″ and 10″ respectively from the back edge.

Over the entire surface pour a uniform coating of the asphalt and embed therein, while hot, not less than 250 lbs. of slag for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Ten-Year Guaranty Bond.

SPECIFICATION No. 602*

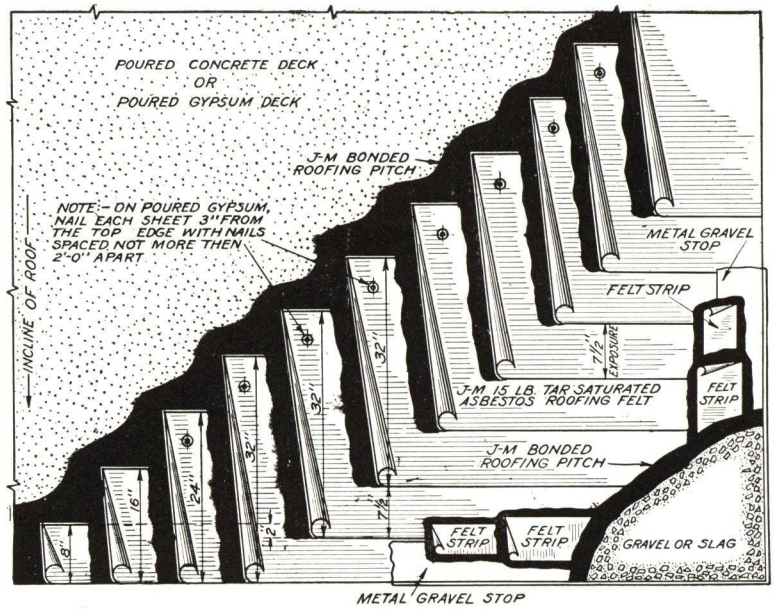
J-M 20-YEAR ROOF OVER BOOK TILE, POURED OR PRECAST CONCRETE DECKS

Inclines: Not to exceed 1 inch per foot

OVER POURED GYPSUM DECKS

Inclines: Not to exceed 2 inches per foot

Surface: SLAG or GRAVEL
Felts: ASBESTOS
Waterproofing: PITCH (TAR)



BILL OF MATERIALS PER 100 SQ. FT.

***FELTS:** 4 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	65 lb.
PITCH: J-M Bonded Roofing Pitch	200 lb.
SURFACING: Gravel	400 lb.
or Slag	300 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All roofing felts shall be turned up 2″ on all vertical surfaces without being cemented thereto. All nails shall be driven through flat metal disks.

Roofing—Lay four plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 24½″ over the preceding one, mopping the full width under each with the pitch. If roof construction is of poured gypsum, nail each sheet at 24″ centers, 3″ from the back edge.

If roof construction is of precast concrete, the pitch applied to the roof surface shall be omitted for a width of 4″ each side of all joints between the slabs.

Over the entire surface pour a uniform coating of the pitch and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(If a bond is required, add the following:)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 702

Felts: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

SPECIFICATION No. 605*

J-M 15-YEAR ROOF OVER BOOK TILE, POURED OR PRECAST CONCRETE DECKS

Inclines: Not to exceed 1 inch per foot

OVER POURED GYPSUM DECKS

Inclines: Not to exceed 2 inches per foot

Surface: SLAG or GRAVEL
Felts: ASBESTOS
Waterproofing: PITCH (TAR)

BILL OF MATERIALS PER 100 SQ. FT.

***FELTS:** 3 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	49 lb.
PITCH: J-M Bonded Roofing Pitch	150 lb.
SURFACING: Gravel	400 lb.
or Slag	300 lb.

ROOF DECK

(*Copy from Specification No. 602, above.*)

INSTALLATION

General—(*Copy from Specification No. 602, above*).

Roofing—Lay three plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 22″ over the preceding one, mopping the full width under each with the pitch. If roof construction is of poured gypsum, nail each sheet at 24″ centers, 3″ from the back edge.

If roof construction is of precast concrete, the pitch applied to the roof surface shall be omitted for a width of 4″ each side of all joints between the slabs.

Over the entire surface pour a uniform coating of the pitch and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

(*Copy from Specification No. 602, above, except change to* "Fifteen-Year.")

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 705

Felts: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

SPECIFICATION No. 603*

J-M 10-YEAR ROOF OVER POURED CONCRETE DECKS

Inclines: 1 in. to 6 inches per foot

OVER POURED GYPSUM DECKS

Inclines: 2 in. to 6 inches per foot

Surface: SLAG

Felts: ASBESTOS

Waterproofing: PITCH (TAR)

BILL OF MATERIALS PER 100 SQ. FT.

*FELTS: 4 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	65 lb.
PITCH: J-M Bonded Roofing Pitch (for mopping between felts)	65 lb.
ASPHALT: J-M Bonded Roofing Asphalt (for top surfacing)	45 lb.
SURFACING: Slag	250 lb.

ROOF DECK

(*Copy from Specification No. 602, opposite.*)

INSTALLATION

General—(*Copy from Specification No. 602, opposite.*)

Roofing—Lay four plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 24½" over the preceding one. These felts shall be cemented to the roof by path-moppings of the pitch, such moppings to be run parallel to the incline, to be not less than 12" nor more than 18" wide, the distance between to be not more than twice the width of such moppings. These felts shall also be cemented to each other continuously by mopping under each with the pitch to a width of 18", starting 2" from the exposed edge. If roof construction permits, nail each sheet at 12" centers, 10" from the back edge.

With nailing strips provided as required, nail each sheet at each nailing strip with two nails spaced 8" and 10" respectively from the back edge.

Over the entire surface pour a uniform coating of the asphalt and embed therein, while hot, not less than 250 lbs. of slag for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.*)

(*If a bond is required, add the following:*)

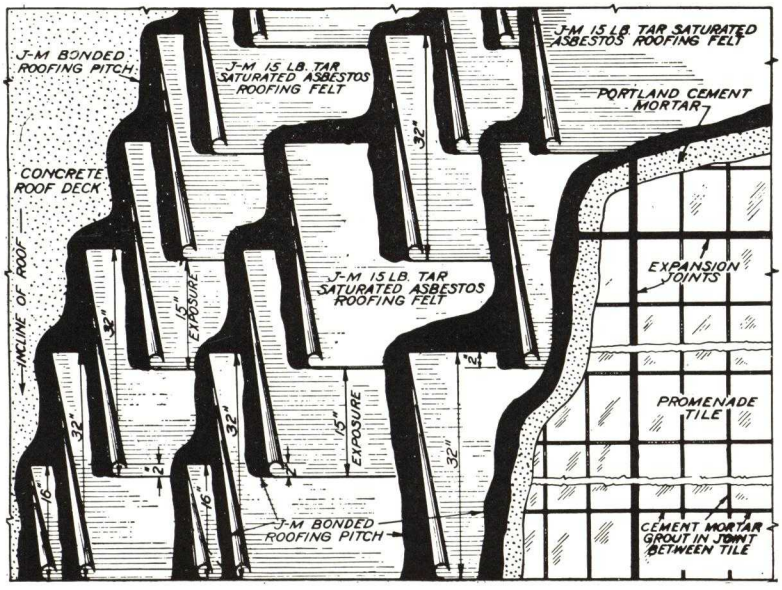
GUARANTEE

(*Copy from Specification No. 602, opposite, except change to* "Ten-Year".)

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 703

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")



SPECIFICATION No. 612*

J-M BUILT-UP ROOF UNDER PROMENADE TILE OVER CONCRETE DECKS

Surface: SMOOTH

Felts: ASBESTOS

Waterproofing: PITCH (TAR)

Inclines: Not to exceed 1 inch per foot

BILL OF MATERIALS PER 100 SQ. FT.

*FELTS: 5 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	81 lb.
PITCH: J-M Bonded Roofing Pitch	200 lb.
FLASHING: Copper.	
SURFACING: 6" x 9" x 1" Promenade Tile.	

ROOF DECK

General—(*Copy from Specification No. 602, opposite.*)

INSTALLATION

General—(*Copy from Specification No. 602, opposite.*)

Roofing—Coat the roof deck with bonded pitch and lay two plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 17" over the preceding one and mopping the full width under each with the pitch. Then apply two additional layers of the 15-lb. tar-saturated felts, cementing them to the roof surface and to each other in the same manner as the first two plies, and again coat the entire roof surface with the pitch.

Immediately preceding the laying of the tile, thoroughly clean the roof surface and mop with bonded pitch into which, while hot, embed one additional layer of the 15-lb. tar-saturated felt, lapping each sheet 2" over the previously laid sheet. Then coat the entire surface with bonded pitch.

Promenade Tile—On top of the Built-up Roof, lay the promenade tile in a bedding of portland cement mortar not less than 1" thick, with expansion joints in both directions on 20 ft. centers, and also at all walls, curbs and other vertical surfaces. Expansion joints shall be not less than 1" wide and shall extend through the tile and cement bed to the Built-up Roof, and shall be filled with J-M Expansion Joint Filler, poured while hot. All joints between the tile, other than expansion joints, shall be grouted with portland cement mortar.

(*If a bond is required, consult Johns-Manville.*)

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 712

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

SPECIFICATION No. 607*

J-M 20-YEAR ROOF OVER INSULATION

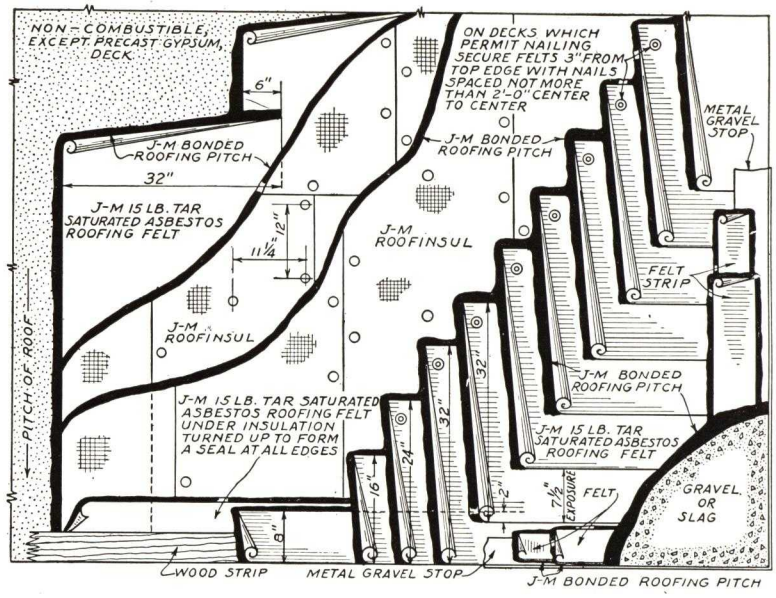
ON POURED CONCRETE DECKS

Inclines: Not to exceed 1 inch per foot

ON POURED GYPSUM DECKS

Inclines: Not to exceed 2 inches per foot

Surface: SLAG or GRAVEL
Felts: ASBESTOS
Waterproofing: PITCH (TAR)
Insulation: ROOFINSUL



BILL OF MATERIALS PER 100 SQ. FT.

*FELTS: (Under Insulation) 1 layer of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.) ..... 16¼ lb.

*FELTS: (In Built-Up Roof) 4 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.) ..... 65 lb.

PITCH: J-M Bonded Roofing Pitch (for mopping between felts) 200 lb.
For mopping insulation over felt ..... 30 lb.
For mopping each additional ply of insulation ..... 30 lb.

INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick)
For each layer of insulation ..... 100 sq. ft.

SURFACING: Gravel ..... 400 lb.
or Slag ..... 300 lb.

ROOF DECK

(a) Roof construction, including cants, coves or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—All felts applied over the insulation shall be turned up 2" on all vertical masonry surfaces and 4" on all vertical wood surfaces, without being cemented thereto. All nails shall be driven through flat metal disks.

Felt Under Insulation—Lay one ply of the 15-lb. tar-saturated felt, lapping the sheets 6", mopping the full width under each with the pitch. This felt shall be turned up on, but not cemented to, all vertical surfaces to a height 6" greater than the thickness of the insulation and shall overhang all roof edges a similar amount.

Insulation—Lay the Roofinsul with the rough side down and with all end joints broken, mopping the full width under each sheet with the pitch. The edges of the sheets at the joints shall be thoroughly sealed with the pitch. The insulation shall be isolated into areas approximately 30' 0" square by path-strippings of one ply of the 15-lb. tar-saturated felt, mopped the full width with the pitch, to extend not less than 4" over the edge of the insulation in place and not less than 4" under the adjoining insulation to be laid.

If the roof construction is of poured gypsum, nail each sheet of the insulation at 12" centers, adjacent to the longitudinal edges and staggered through the longitudinal center.

If the insulation is to be applied in more than one layer, succeeding layers shall be applied and cemented in the same manner as the first layer, the sheets of each layer to break joints with those of the preceding layer, with all nailing done through the top layer.

The overhanging felt at roof edges shall be turned over and mopped solidly to the insulation.

Insulation shall not be left exposed to the weather. No more insulation shall be laid than can be completely covered with the roofing felts on the same day. At the end of the day's work, roofing felts shall be turned down over the exposed edges of the insulation and mopped solidly to the insulation.

Roofing—Lay four plies of 15-lb. tar-saturated felt, lapping each sheet 24½" over the preceding one, mopping the full width under each with the pitch. If roof construction is of poured gypsum, nail each sheet at 24" centers, 3" from the back edge.

Over the entire surface pour a uniform coating of the pitch and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Not less than 230 lbs. of the pitch shall be used per 100 sq. ft. of completed roof.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

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*A built-up roof of this same construction is available, differing in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 707

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

SPECIFICATION No. 609*

J-M 15-YEAR ROOF OVER INSULATION

ON POURED CONCRETE DECKS

Inclines: Not to exceed 1 inch per foot

ON POURED GYPSUM DECKS

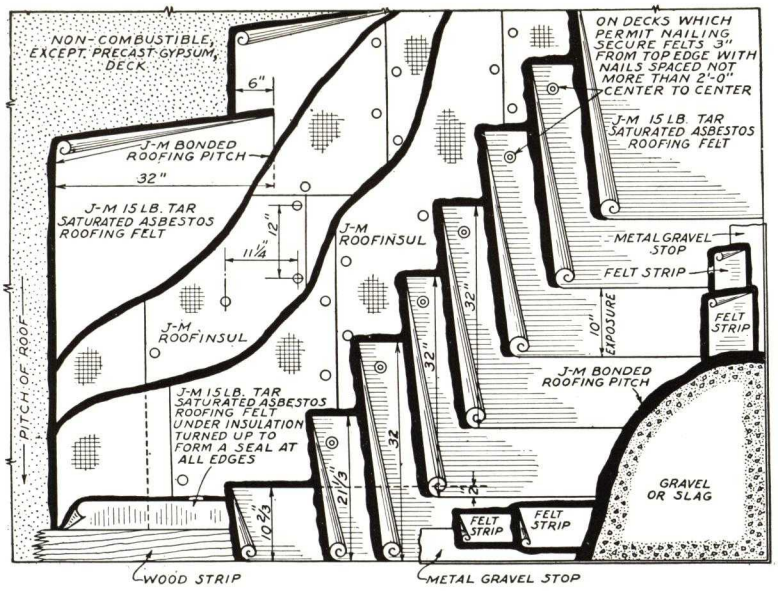
Inclines: Not to exceed 2 inches per foot

Surface: SLAG or GRAVEL

Felts: ASBESTOS

Waterproofing: PITCH (TAR)

Insulation: ROOFINSUL



BILL OF MATERIALS PER 100 SQ. FT.

***FELT: (Under Insulation)** 1 layer of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	16¼ lb.
***FELTS: (In Built-Up Roof)** 3 layers of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per sq. ft.)	49 lb.
PITCH: J-M Bonded Roofing Pitch (for mopping between felts)	150 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick) For each layer of insulation	100 sq. ft.
SURFACING: Gravel	400 lb.
or Slag	300 lb.

ROOF DECK

(*Copy from Specification No. 607, opposite.*)

INSTALLATION

Insulation—(*Copy from Specification No. 607, opposite.*)

Felt Under Insulation—(*Copy from Specification No. 607. opposite.*)

Insulation—(*Copy from Specification No. 607, opposite.*)

Roofing—Lay three plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 22" over the preceding one, mopping the full width under each with the pitch. If roof construction is of poured gypsum, nail each sheet at 24" centers, 3" from the back edge.

Over the entire surface pour a uniform coating of the pitch and embed therein, while hot, not less than 400 lbs. of gravel, or 300 lbs. of slag, for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

(*Copy from Specification No. 607, opposite, except change to* "Fifteen-Year.")

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 709

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

SPECIFICATION No. 611*

J-M 10-YEAR ROOF OVER INSULATION

on Poured Concrete Decks

Inclines: 1 in. to 6 inches per foot

on Poured Gypsum Decks

Inclines: 2 in. to 6 inches per foot

Surface: SLAG

Felts: ASBESTOS

Waterproofing: PITCH (TAR)

Insulation: ROOFINSUL

BILL OF MATERIALS PER 100 SQ. FT.

***FELT: (Under Insulation)** 1 layer of J-M 15-lb. Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	16¼ lb.
***FELTS: (In Built-Up Roof)** 4 layers of J-M 15-lb Tar-Saturated Asbestos Roofing Felt (16¼ lb. per 108 sq. ft.)	65 lb.
PITCH: J-M Bonded Roofing Pitch (for mopping between felts)	94 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
ASPHALT: J-M Bonded Roofing Asphalt (for top surfacing)	45 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick) For each layer of insulation	100 sq. ft.
SURFACING: Slag	250 lb.

ROOF DECK

(*Copy from Specification No. 607, opposite.*)

INSTALLATION

General—(*Copy from Specification No. 607, opposite.*)

Felts Under Insulation—(*Copy from Specification No. 607, opposite.*)

Insulation—(*Copy from Specification No. 607, opposite.*)

Roofing—Lay four plies of the 15-lb. tar-saturated roofing felt, lapping each sheet 24½" over the preceding one, mopping under each with the pitch to a width of 30" starting 2" from the exposed edge.

With nailing strips provided as required, nail each sheet at each nailing strip with two nails spaced 8" and 10" respectively from the back edge.

Over the entire surface pour a uniform coating of the asphalt and embed therein, while hot, not less than 250 lbs. of slag for each 100 sq. ft. of roof surface.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

(*Copy from Specification No. 607, opposite, except change to* Ten-Year".)

*A built-up roof of this same construction is available, differing only in the use of rag instead of asbestos felt. To specify, make following changes:

SPECIFICATION NO. 711

FELTS: (*Change name of felt to* "J-M 15-lb. Bonded Tar-Saturated Rag Felt.")

SPECIFICATION No. 108

J-M 20-YEAR ROOF OVER INSULATION ON STEEL DECKS

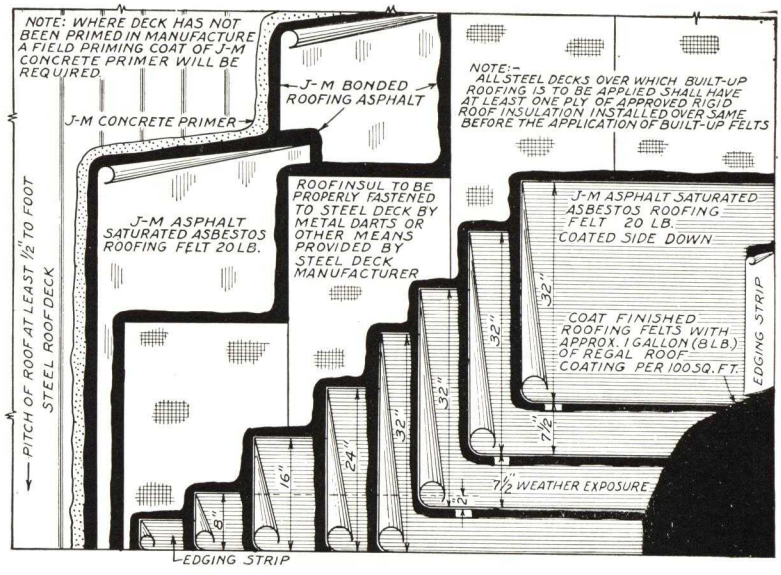
Surface: SMOOTH

Felts: ASBESTOS

Waterproofing: ASPHALT

Insulation: ROOFINSUL

Inclines: ½ in. to 6 inches per foot



BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 4 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	80 lb.
(An additional ply of 20-lb. asbestos felt is specified for application under the insulation, in Specification No. 502. See page 28.)	
PRIMER (unless steel deck has been shop-coated): J-M Concrete Primer (8 lb. per gal.)	1 gal.
ASPHALT: J-M Bonded Roofing Asphalt (for mopping between felts)	120 lb.
For mopping felt to deck	30 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick) For each layer of insulation	100 sq. ft.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(a) Roof construction, including cants, covers or fillets, shall be properly graded to gutters and roof drains, leaving all surfaces smooth, clean, sound and dry, in satisfactory condition to receive the roofing.

(b) Nailing strips shall be furnished by others, as required, embedded in the wall structure, to which to secure the flashing.

INSTALLATION

General—If the pitch of the roof is 3" to the foot or less, the felts shall be laid at right angles to the pitch. If the pitch of the roof is over 3" to the foot, the felts shall be laid parallel to the pitch. The roof felts shall be turned up 2" on all vertical surfaces without being cemented thereto.

Insulation—(*Copy from J-M Standard Specification No. 502, page 28.)*

Roofing—Lay four plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 24½" over the preceding one, mopping the full width under each with the asphalt.

Coat the entire surface with the roof coating.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Twenty-Year Guaranty Bond.

SPECIFICATION No. 109

J-M 15-YEAR ROOF OVER INSULATION ON STEEL DECKS

Surface: SMOOTH

Waterproofing: ASPHALT

Felts: ASBESTOS

Insulation: ROOFINSUL

Inclines: ½ in. to 6 ins. per foot

BILL OF MATERIALS PER 100 SQ. FT.

FELTS: 3 layers of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt	60 lb.
(An additional ply of 20-lb. asbestos felt is specified for application under the insulation, in Specification No. 502. See page 28.)	
PRIMER (unless steel deck has been shop-coated): J-M Concrete Primer (8 lb. per gal.)	1 gal.
ASPHALT: J-M Bonded Roofing Asphalt (for mopping between felts)	90 lb.
For mopping felt to deck	30 lb.
For mopping insulation over felt	30 lb.
For mopping each additional ply of insulation	30 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft. ½" thick) For each layer of insulation	100 sq. ft.
ROOF COATING: J-M Regal Roof Coating (Black) (8 lb. per gal.)	1 gal.

ROOF DECK

(*Copy from Specification No. 108, above.*)

INSTALLATION

General—(*Copy from Specification No. 108, above.*)

Insulation—(*Copy from J-M Standard Specification No. 502, page 28.)*

Roofing—Lay three plies of the 20-lb. asbestos felt, with the coated side down, lapping each sheet 22" over the preceding one, mopping the full width under each with the asphalt.

Coat the entire surface with the roof coating.

Flashing—(*Copy from J-M Standard Specification for Flashing, page 29.)*

(*If a bond is required, add the following:*)

GUARANTEE

The work shall be done by a roofing contractor approved by the manufacturer. The roofing contractor shall furnish a Johns-Manville Fifteen-Year Guaranty Bond.

Protecting insulated roofs against humidity

For many years it has been generally recognized that wherever humid conditions may be encountered, it is essential that roof insulation be protected on the *underside* against the absorption of moisture. Specifications of architects and roofing manufacturers have, therefore, called for a membrane waterproofing course under the insulation wherever it was known at the time the roof was designed that the insulation would be subjected to such conditions.

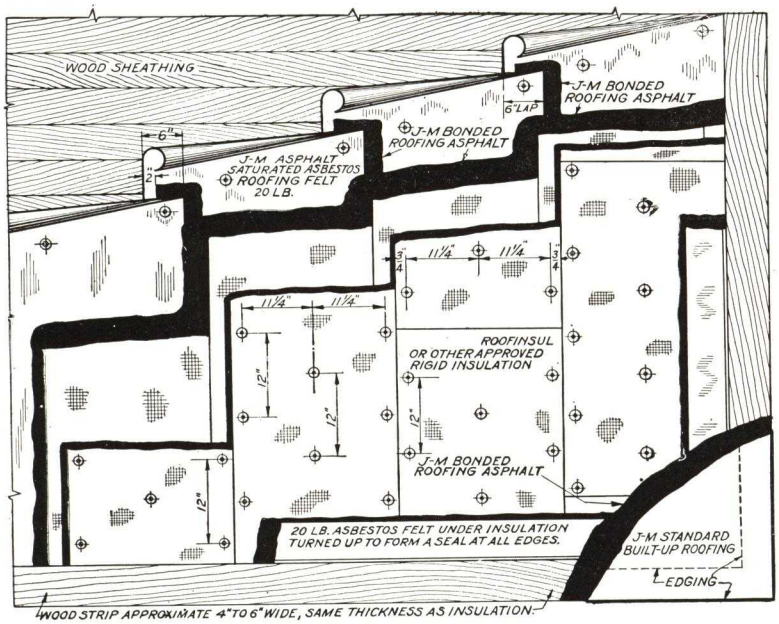
But there are occasions, after a relatively few years, where there is a change in the use to which a building is put. From an operation not in the least humid, the condition may change almost overnight into one which exposes the insulation to severe moisture conditions.

All types of roof insulation will absorb moisture. The very factor that makes the material effective as an insulation—porosity—is, of course, responsible for its absorption of moisture. When insulation on a roof becomes water-soaked, the results are:

(a) A serious reduction in insulating efficiency.
(b) Destruction of bond between insulation and roofing felts.
(c) Disintegration of the insulating material.
(d) Almost certain damage to the roof deck itself.
(e) Possible damage to the building contents.
(f) An expensive re-roofing and re-insulating job.

All Johns-Manville Roof Insulation Specifications call for the application of a layer of waterproof roofing felt *under* the insulation.

JOHNS-MANVILLE ROOF INSULATION



SPECIFICATION No. 500

J-M ROOFINSUL

ON WOOD DECKS

TO BE OVERLAID WITH A J-M ASPHALT BUILT-UP ROOF

BILL OF MATERIALS PER 100 SQ. FT.

FELT (under insulation): 1 layer of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt..... 20 lb.

INSULATION: J-M Roofinsul (0.8 lb. per sq. ft., ½" thick) For each layer of insulation .....100 sq. ft.

ASPHALT: J-M Bonded Roofing Asphalt For mopping each layer of insulation ..... 30 lb.

ROOF DECK

As J-M Roofinsul (rigid roof insulation) requires, and is designed to receive, built-up roofing directly over it, the following specification has been prepared to be appended to certain Standard Specifications for J-M Asphalt Built-Up Roofs. The specifications for such roofs, designed particularly for application over approved rigid insulation on wood decks, are given on previous pages. The roof deck, before being considered satisfactory to receive the insulation, shall be in the condition outlined in the pertinent built-up roof specification.

INSULATION

(a) Lay one ply of the 20-lb. asbestos felt, lapping the sheets 6", mopping in the laps with the asphalt and nailing sufficiently to hold in place. This felt shall be turned up on, but not cemented to, all vertical surfaces to a height 6" greater than the thickness of the insulation and shall overhang all roof edges a similar amount.

(b) Lay the Roofinsul with the rough side down and with all end joints broken, mopping the full width under each sheet with the asphalt. The edges of the sheets at the joints shall be thoroughly sealed with the asphalt.

(c) The insulation shall be isolated into areas approximately 30 ft. square by path-strippings of one ply of the 20-lb. asbestos felt, mopped the full width with the asphalt, to extend not less than 4" over the edge of the insulation in place and not less than 4" under the adjoining insulation to be laid.

NAILING

Each sheet of the insulation shall be nailed at 12" centers, adjacent to the longitudinal edges and staggered through the longitudinal center. If it be applied in more than one layer, succeeding layers shall be applied in the same manner as the first layer, the sheets of each layer to break joints with those of the preceding layer, with all nailing done through the top layer.

SEALING

The upturned felt at vertical surfaces and roof edges shall be turned down and mopped solidly to the insulation.

PROTECTION

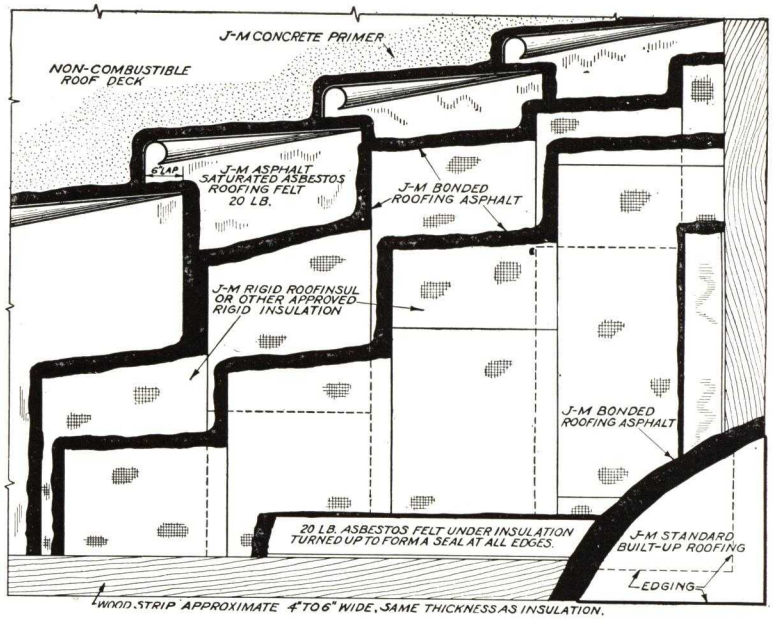
Insulation shall not be left exposed to the weather. No more insulation shall be laid than can be completely covered with the roofing felts on the same day. At the end of the day's work, roofing felts shall be turned down over the exposed edges of the insulation and mopped solidly.

SPECIFICATION No. 501

J-M ROOFINSUL
ON NON-COMBUSTIBLE DECKS
TO BE OVERLAID WITH A J-M ASPHALT BUILT-UP ROOF

BILL OF MATERIALS PER 100 SQ. FT.

FELT: 1 layer of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt ..... 20 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft., ½" thick) For each layer of insulation ..... 100 sq. ft.
PRIMER: J-M Concrete Primer (8 lb. per gal.):
Over Concrete ..... 1 gal.
Over Gypsum ..... 1½ to 2 gal.
ASPHALT: J-M Bonded Roofing Asphalt
For mopping each layer of insulation ..... 30 lb.



ROOF DECK

(*Copy from Specification No. 500, on previous page.*)

INSULATION

(a) Coat all surfaces which are to receive the insulation with the asphalt primer and allow to dry.

If deck is composed of precast units, the primer and asphalt shall be omitted 4" each side of all joints.

(b) Lay one ply of the 20-lb. asbestos felt, lapping the sheets 6", mopping the full width under each with the asphalt. This felt shall be turned up on . . . (*Balance, same as paragraph (a) of Specification No. 500, on previous page.*)

(c) (*Copy paragraph (b) of Specification No. 500.*)

(d) (*Copy paragraph (c) of Specification No. 500.*)

NAILING

If roof construction permits, nail each sheet at 12" centers adjacent to the longitudinal edges and staggered through the longitudinal center. With nailing strips provided as required, each sheet shall be nailed at each strip at 12" centers.

SEALING

(*Copy from Specification No. 500, on previous page.*)

PROTECTION

(*Copy from Specification No. 500, on previous page.*)

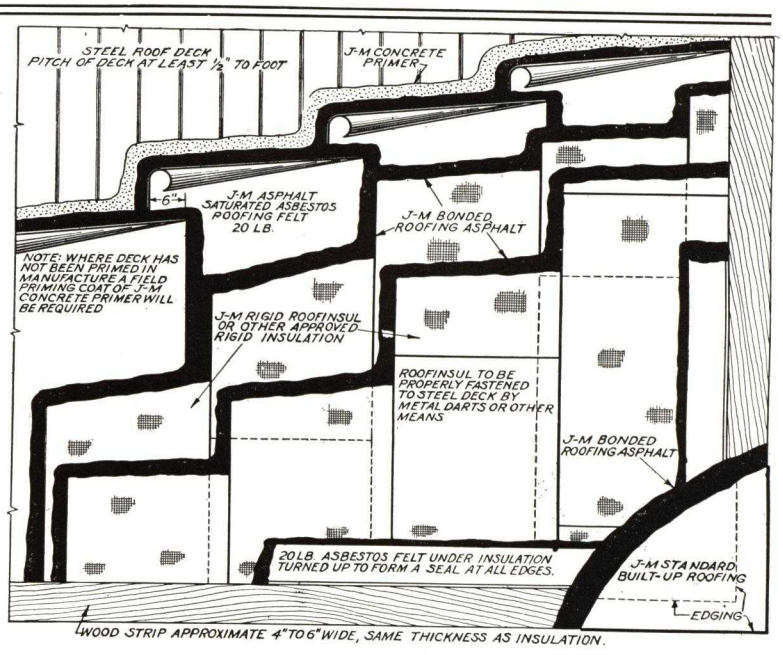
SPECIFICATION No. 502

J-M ROOFINSUL
ON STEEL DECKS
TO BE OVERLAID WITH A J-M ASPHALT BUILT-UP ROOF

Minimum Pitch: ½ inch per foot

BILL OF MATERIALS PER 100 SQ. FT.

FELT (under insulation): 1 layer of J-M 20-lb. Asphalt-Saturated Asbestos Roofing Felt ..... 20 lb.
INSULATION: J-M Roofinsul (0.8 lb. per sq. ft., ½" thick) For each layer of insulation ..... 100 sq. ft.
PRIMER (unless steel deck has been shop-coated): J-M Concrete Primer (8 lb. per gal.) ..... 1 gal.
ASPHALT: J-M Bonded Roofing Asphalt
For mopping each layer of insulation ..... 30 lb.



ROOF DECK

(*Copy from Specification No. 500, on previous page.*)

INSULATION

(a) If the steel deck has not been shop-coated with asphalt paint, or if such coating is incomplete or has been damaged, the entire deck or such uncoated areas shall be painted with the primer and allowed to dry.

(b) (*Copy paragraph (b) of Specification No. 501, above.*)

(c) (*Copy paragraph (b) of Specification No. 500.*)

(d) (*Copy paragraph (c) of Specification No. 500.*)

SECURING OF INSULATION

If the pitch of the roof deck is 3" per foot or greater, the insulation shall be secured by means of steel darts or other approved device. (*Follow with the second sentence under* "Nailing" *in Specification 500, changing word* "nailing" *to* "fastening."

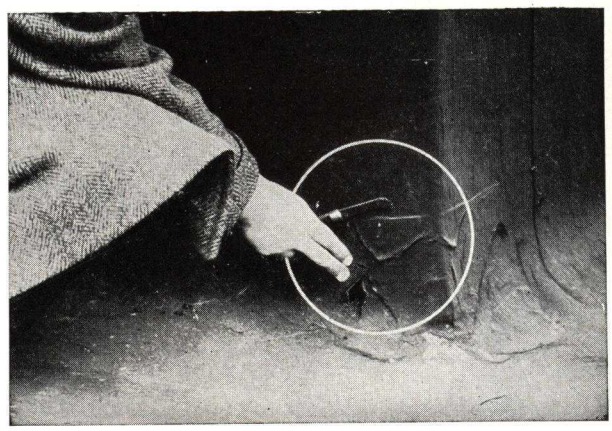
SEALING AND PROTECTION

(*Copy from Specification No. 500, on previous page.*)

The Critical Part of a Roof is the Flashing

MORE than at any other place on a roof, a leak is apt to occur at the junction formed by the roof deck and a vertical surface, such as a parapet wall, skylight curb or wall of an adjacent building. Most roof decks are separate units from these vertical surfaces and are constructed of different materials. There is a natural weakness at the angle, due to shrinkage of the material, expansion or contraction, or other movement of the building. Also, the wall absorbs a certain amount of moisture. For this reason it is most desirable that the flashing should go all the way through the wall. This method isolates the roof deck and keeps water from seeping down through the wall and under the roofing.

Johns-Manville has designed several types of flashing so that any of the different conditions encountered in a roof can be handled successfully. In designing these flashings, the application of roofing and flashing have definitely been made two separate operations. The laying of the roofing felts should be completed before applying the flashing. Before any work is done, a cant strip, a "V"-shaped piece of lumber, or other nailing base is installed in the angle formed by the roof and the vertical surface, so that instead of a sharp angle there is formed a gradual slope.



More leaks occur at the flashing than at any other part of a roof. THROUGH-THE-WALL FLASHING is the safest known method of providing a permanently weather-tight job at this vulnerable point.

Johns-Manville Asbestos Flashing Felts are made from the same basic materials as the asbestos roofing felts. The waterproofing or cementing agent is Johns-Manville Asbestile, a heavy-bodied, plastic cement composed of asbestos fibres, asphalt and other mineral ingredients, which hardens after application and *becomes a part of the wall itself.*

J-M ASBESTILE FLASHING SYSTEM (10-YEAR BOND)

Johns-Manville Flashing may be installed to cover completely the top and inside face of parapet walls, to extend through walls, or to extend not less than 8″ high on the inside face only. J-M Flashing may also be used with a sheet metal cap flashing built into the walls, or it may be used in conjunction with raggle blocks. As Johns-Manville Flashing is used only in connection with Johns-Manville Built-up Roofing, the following specification has been prepared to be appended to the Standard Specifications for such Built-up Roofs:

The height of flashing on parapet walls shall be (*state whether "not less than 8″" or "so as to cover completely entire inside face of wall and top of wall under coping to within 2″ of outside face" or "not less than 8″ with cap flashing built into and extended through wall to form a dampproof course." If flashing is to be carried into raggle block, so state.*)

The height of flashing on high walls shall be (*state whether "same height as on adjoining parapet walls" or "not less than 8″, with cap flashing built into and extended through wall to form a dampproof course."*)

All masonry surfaces which are to receive the base or cap flashing shall be coated with J-M Concrete Primer and allowed to dry.

BASE FLASHING (*See drawings on next page.*)

Lay one thickness of the 15-lb., or 20-lb. roofing felt to extend not less than 6″ high on the vertical surface to be flashed, and not less than 4″ on the roof, lapping the sheets 3″, moping the full width under each with asphalt, or with pitch, if applied with roofs employing pitch.

A base flashing composed of J-M Asbestos Base Flashing Material shall be applied directly over and entirely covering the 15-lb. or 20-lb. roofing felt, cemented to it with the asphalt or pitch.

The base flashing shall be nailed, adjacent to its upper and end edges, with large head nails spaced on not to exceed 4″ centers driven into the brick joints or the nailing strip.

The edge of the base flashing on the roof shall be covered with a 4″ wide strip of 15-lb. Asbestos Felt, embedded in and coated over with asphalt or pitch.

The end joints shall be covered with Asbestile, as specified under "Cap Flashing." (*See page* 31.)

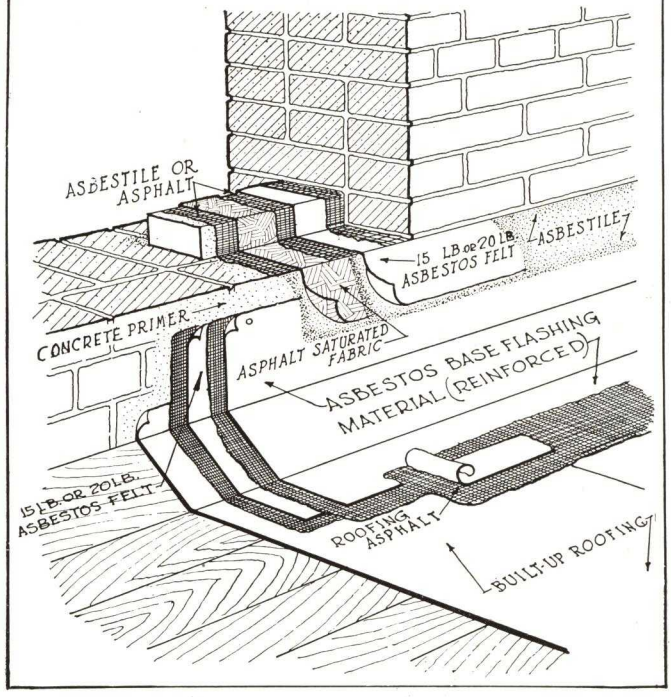
On skylight curbs, etc., the flashing shall extend the full height, and turn over on top the full width, of the curb.

If no nailing facilities have been provided for securing the upper edge of the base flashing, a five-course cap and base flashing will be acceptable, constructed of alternating layers of Asbestile and 15-lb. Asbestos Felt. Such flashing shall be applied in a manner similar to that specified later for the application of cap flashing to full height of wall, repeating the operations described to provide three layers of Asbestile and two layers of felt. Such flashing shall extend on the vertical surfaces and on the roof the same distance as specified for the flashing method it displaces.

Details showing various methods of flashing Johns-Manville Bonded Built-up Roofs

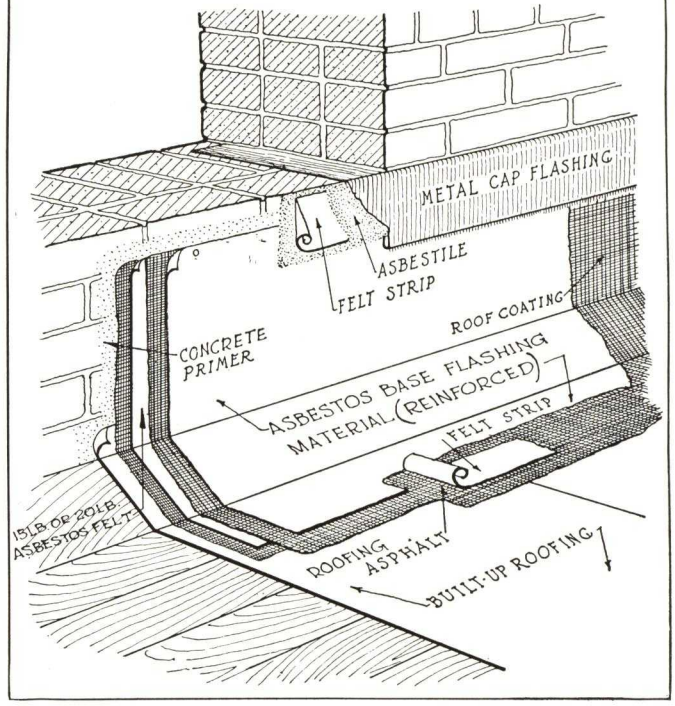
J-M Base and Cap Flashing

Cap flashing extended through the wall



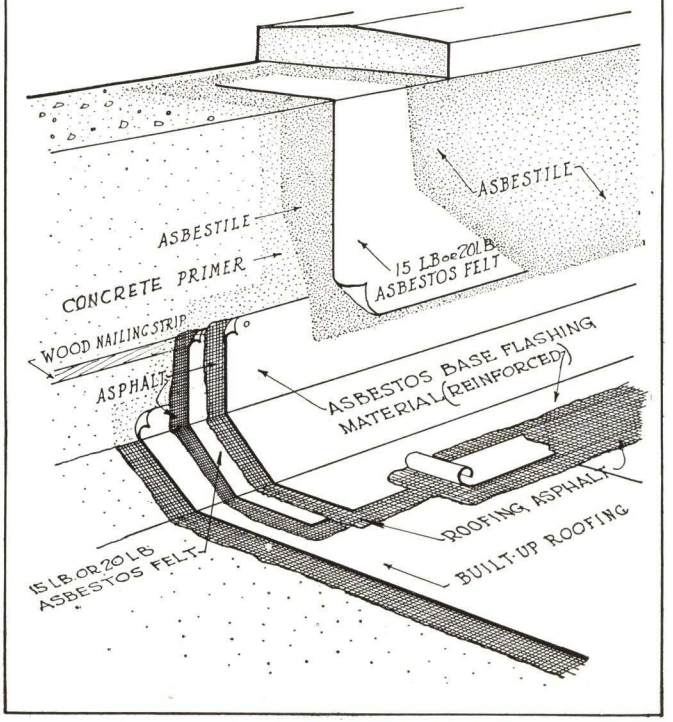
J-M Base and Cap Flashing

Not less than 8″ high under metal cap flashing



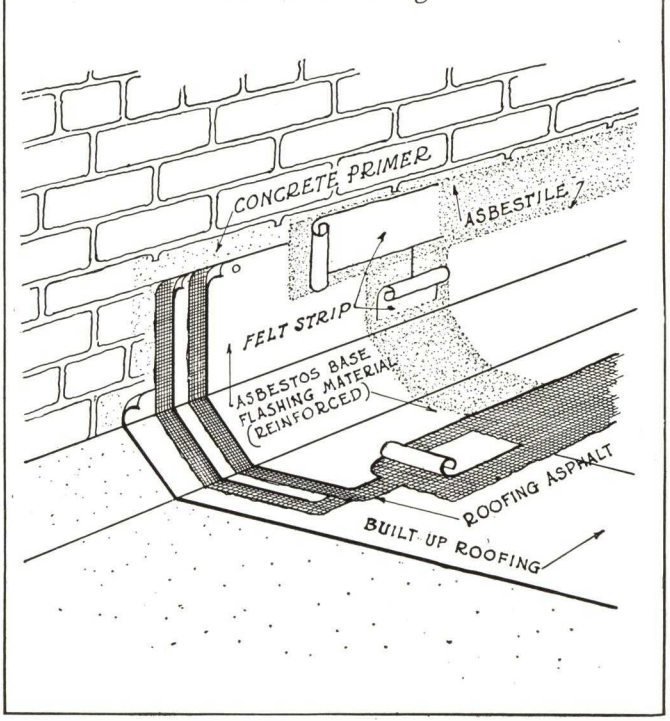
J-M Base and Cap Flashing

Full height of wall and under coping



J-M Base and Cap Flashing

Not less than 8″ high



BASE FLASHING WITH RAGGLE BLOCK

The groove in the raggle block shall be coated with J-M Concrete Primer and allowed to dry.

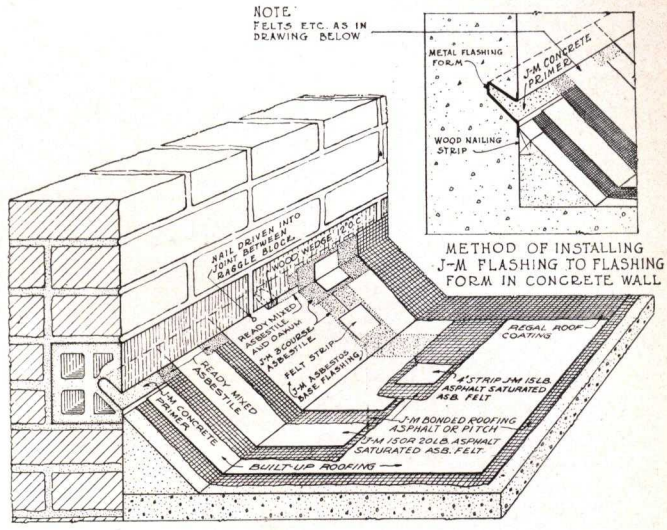
One thickness of the 15-lb. or 20-lb. roofing felt shall be applied to extend not less than 4″ on the roof, to cover the cant entirely, and to extend to the full depth of the groove in the raggle block. This felt shall be embedded in asphalt, (or, if applied with roofs employing pitch, either such pitch or asphalt may be used) on the roof and cant, and in a layer of J-M Ready-mixed Asbestile, approximately ⅛″ thick, in the groove in the raggle block.

One thickness of J-M Asbestos Base Flashing Material shall be applied directly over and entirely covering the 15-lb. or 20-lb. felt and similarly cemented to it with the asphalt or pitch and the Asbestile. The base flashing shall be nailed adjacent to the groove, into the joints between raggle blocks. At all joints of the base flashing material, and at 12″ centers between, wood wedges, primed and coated with Asbestile, shall be driven into the groove to prevent slippage of the flashing. Any remaining voids in the grooves shall be caulked with Asbestile and oakum. A layer of Asbestile, approximately ⅛″ thick, shall be troweled in place to extend not less than 3″ on the cant and 2″ on the face of the raggle block to cover entirely the groove in the raggle block.

A strip of the 15-lb. or 20-lb. felt not less than 4″ wide shall be embedded therein and a second layer of Asbestile, of the same thickness as the first, troweled over and finished to a feather edge and to a straight line at the upper and lower edges.

The edge of the base flashing on the roof shall be covered with a 4″ wide strip of the 15-lb. felt embedded in and coated over with asphalt or pitch.

The end joints of the base flashing shall be covered with Asbestile as specified under "Cap Flashing." (*See below.*)



METHOD OF INSTALLING J-M FLASHING TO RAGGLE BLOCK IN BRICK WALL

CAP FLASHINGS (See drawings on opposite page)

When J-M Flashing is specified to be not less than 8 ins. high or when sheet metal cap flashing is to be used with J-M Flashing

A layer of Asbestile, approximately ⅛″ thick and not less than 5″ wide, shall be troweled in place to cover the nail heads, the upper edge of the base flashing and the adjoining surface of the wall. A strip of 15-lb. Asphalt-saturated Asbestos Felt not less than 4″ wide shall be embedded therein and a second layer of Asbestile, of the same thickness as the first, troweled over and finished to a feather edge and to a straight line at the upper and lower edges. If a sheet metal cap flashing is specified, the Asbestile cap flashing shall extend to the point where such metal flashing protrudes from the wall.

End laps in base flashing shall be similarly covered.

When J-M Flashing is specified to extend full height of wall under coping to within 2 ins. of outside face

A layer of Asbestile, approximately ⅛″ thick, shall be troweled in place to cover the nail heads and the upper edge of the base flashing not less than 4″ and the entire inside face and top of the wall (under the coping) to within 2″ of the outside face. One thickness of 15-lb. Asphalt-saturated Asbestos Felt shall be embedded therein, with the sheets lapped 3″ and sealed with Asbestile, and a second layer of Asbestile, of the same thickness as the first, troweled over and finished to a feather edge and to a straight line at the lower edge.

When J-M Flashing is specified to be not less than 8 ins. high with cap flashing extended through wall

One ply of J-M Type B Asphalt-saturated Fabric shall be applied to the temporary top of the wall, to extend from within 2″ of the outside face to the inside face and project so as to cover the base flashing not less than 4″. This fabric shall be cemented to the top of the wall with the asphalt or Asbestile. One ply of 15-lb. Asphalt-saturated Asbestos Felt shall be applied directly over and entirely covering the fabric, cemented to it, and coated over, with the asphalt or Asbestile. The projecting felts shall be temporarily covered for protection during the completion of the wall. After the wall has been completed and the roofing and base flashing installed, the temporary protection shall be removed and a layer of Asbestile, approximately ⅛″ thick, shall be troweled in place to cover the nail heads and the upper edge of the base flashing and the inside face of the wall to the underside of the projecting fabric and felt. The projecting fabric shall be embedded therein, over which shall be troweled a second layer of Asbestile, of the same thickness as the first, in which shall be embedded the projecting felt, over which shall be troweled a final layer of Asbestile of the same thickness as the preceding layers, finished to a feather edge and to a straight line at the lower edge and to the line of the projecting fabric and felt at the upper edge.

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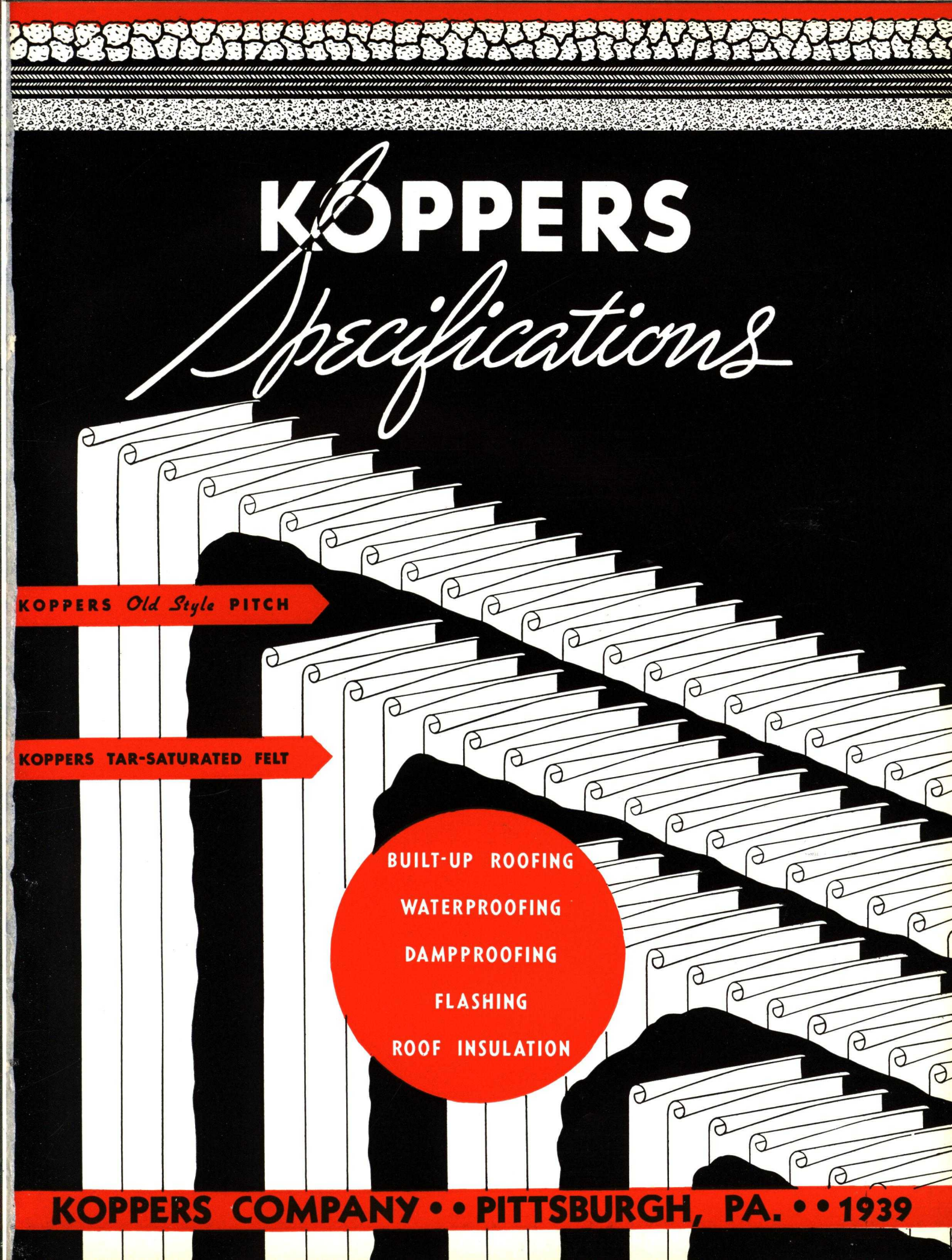
KOPPERS *Specifications*



KOPPERS *Old Style* PITCH

KOPPERS TAR-SATURATED FELT

BUILT-UP ROOFING
WATERPROOFING
DAMPPROOFING
FLASHING
ROOF INSULATION

KOPPERS COMPANY • • PITTSBURGH, PA. • • 1939

INDEX TO ROOFING SPECIFICATIONS

Page

OVER WOOD DECKS

5-Ply—20-Year (Flat Deck) 8
4-Ply—15-Year (Flat Deck) 8
5-Ply—20-Year (Steep Deck) 9
4-Ply—15-Year (Steep Deck) 9
Mineral Surfaced—10-Year (Special Steep Deck) 10

OVER POURED CONCRETE OR POURED GYPSUM

4-Ply—20-Year (Flat Deck) 10
4-Ply—20-Year (Dead Level Deck) 11
3-Ply—15-Year (Flat Deck) 11
4-Ply—20-Year (Steep Deck) 12
Mineral Surfaced—10-Year (Special Steep Deck) 12

OVER PRECAST CONCRETE

4-Ply—20-Year (Flat Deck) 13
3-Ply—15-Year (Flat Deck) 13
5-Ply—20-Year (Steep Deck) 15
4-Ply—15-Year (Steep Deck) 15

OVER PRECAST GYPSUM AND GYPSUM STEEL PLANK

5-Ply—20-Year (Flat Deck) 13
4-Ply—15-Year (Flat Deck) 14
5-Ply—20-Year (Steep Deck) 15
4-Ply—15-Year (Steep Deck) 15

OVER STEEL DECK

4-Ply—20-Year (Flat Deck) 16
3-Ply—15-Year (Flat Deck) 16
4-Ply—20-Year (Steep Deck) 17

UNDER PROMENADE TILE

5-Ply—20-Year (Flat Deck) 18

Page

SPRAY POND OR WATER-COOLED ROOFS

5-Ply—20-Year (Flat Wood Deck) 19
4-Ply—20-Year (Flat Concrete Deck) 19
3-Ply—15-Year (Flat Concrete Deck) 20

INSULATION SPECIFICATIONS

General 21
Over Wood Decks 21
Over Concrete and Gypsum 22
Over Steel Decks 22
Water Cut Offs 23

FLASHING SPECIFICATIONS

20-Year Bonded 25
15-Year Bonded 25
10-Year Bonded 26
Metal Cap and Base Flashing 26
Raggle Block 27

METAL FINISHING STRIP DETAILS

Metal Finishing Strips for Gravel or Slag Roofing 24
Metal Finishing Strips for Mineral Surfaced Roofing 24

WATERPROOFING AND DAMPPROOFING

Dampproofing Paint Method 27
Wood Floors 27
Poured Concrete Floors 27
Wall Waterproofing 28
Floors of Superstructures 29
Introduction and Illustrations 29–30
Pitch Dampproofing Method 30
Sub-Floor Tar Dampproofing 30
High Penetration Dampproofing 30
Membrane Waterproofing 31
Waterproofing Residence Foundations 34
Waterproofing Deep Foundations 34
Waterproofing Sidewalk Vaults 34
Waterproofing Shower Baths 35
Waterproofing Indoor Swimming Pool 35
Waterproofing Subterranean Tunnels Between Buildings 35

ALL KOPPERS ROOFING SPECIFICATIONS ARE WRITTEN IN BLANK

In this catalog you will find complete standard specifications for all types of coal tar pitch and tarred felt roofs. *All these specifications are written in blank.* No manufacturer's materials are mentioned in the body of any one of them. The only reference to Koppers or to any Koppers products in the roofing specifications is in the section on materials where you will find the statement: "Materials shall be those as manufactured by the Koppers Company,.....Company,..... Company, or approved equal applied according to the above specifications."

You may safely turn any of these roofing specifications over to your stenographer and have her copy them for your master specifications.

In compiling them, we have been guided by standard, accepted practices.

MATERIALS SPECIFICATIONS

KOPPERS APPROVED TARRED FELT meets the fifteen (15) pound tarred felt specifications indicated in this catalog. Koppers Approved Tarred Felt meets the following specifications: The Underwriters' Laboratories; Federal Specifications No. HH-F-201; and A.S.T.M. D-227-27.

KOPPERS OLD STYLE PITCH complies with the following standard specifications:

U. S. Government Master Specifications R. P.-381 (Federal Specifications Board)—"Coal Tar Pitch for Roofing."

A. S. T. M. D.-252-27—"High Bitumen Coal Tar Pitch for use in Constructing Built-up Roofs Surfaced with Slag or Gravel."

Underwriters' Laboratories.

THE ADVANTAGES OF THE FLAT DECK ROOFS

Flat roof decks are economical to construct and maintain and they are particularly useful on two or three-story buildings erected on foundations designed to carry additional stories. They are usually more pleasing architecturally; they often permit better ventilation and they make possible the high and low bay type of construction which delivers better light in industrial buildings.

THE ADVANTAGES OF COAL TAR PITCH FOR FLAT ROOFS

Two important questions should be asked about any roofing to be applied on flat decks:

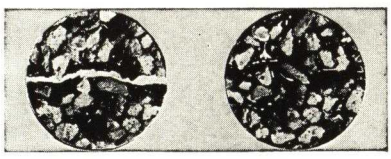
1. Can it resist prolonged contact with water without deteriorating?
2. Does it have the ability to heal itself automatically?

Roofs built with KOPPERS Old Style Coal Tar Pitch **do** resist water and they **do** heal themselves.

Many Koppers Roofs like this, where water lies constantly or intermittently as part of the air-conditioning system, prove the ability of Koppers Old Style Pitch and Tarred Felt to resist deterioration in the presence of water.

1. RESISTANCE TO WATER. Prolonged contact with water is a condition almost impossible to avoid on flat roofs. Poor drainage, low spots, or settlement of the building may cause it. Service records of 15 to 50 years by coal tar pitch roofs with little or no attention prove the resistance of tar to water. KOPPERS Old Style Pitch is practically insoluble in water. None of its constituents has more than a slight water solubility. KOPPERS Old Style Coal Tar Roofing Pitch is resistant to moisture and sunshine.

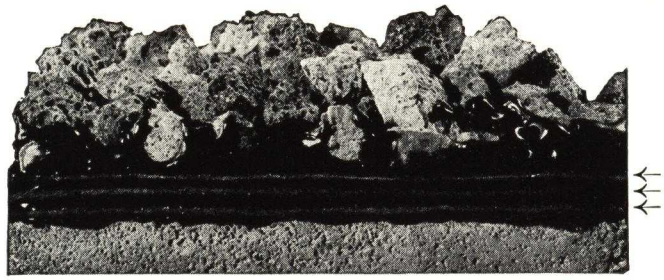
2. THE SELF-HEALING PROPERTY. Weathering and rapid changes in atmospheric conditions can cause cracks in the top surfaces of some types of roofing. However, the vital consideration is whether these cracks are permanent if they do appear. Old Style pitch has a property technically known as "cold flow" and even at ordinary temperatures cracks in the surface heal themselves. This can clearly be seen in photomicrographs which show the sides of the cracks moving slowly together until complete fusion takes place and the pitch again forms a continuous layer. Old Style pitch roofs readily conform to slight irregularities in the deck and yet remain waterproof.



Broken (for Test) **Self-healed at Ordinary Summer Roof Temperature**

These photomicrographs show how a Koppers Old Style Pitch Roof self-heals any small breaks which occur.

THE EXTRA-HEAVY TOP POURING. Additional protection is given a KOPPERS Roof by the extra-heavy top of roofing pitch which is poured on (not mopped). This pouring amounts to approximately 70 pounds for pitch for every 100 square feet of roof surface.



Enlarged Photograph of a Cross-Section of a Koppers Roof Over a Concrete Roof Deck

Arrows indicate layers of Koppers Approved Tarred Felt. Other layers are Koppers Old Style Pitch.

THE GRAVEL OR SLAG SURFACE. The gravel or slag surface on a KOPPERS Roof provides an armor against hail, driving rain, sleet and snow. It also provides additional wearing surface which protects the roof against foot traffic. Roofs with gravel or slag surfaces cling to the deck even in severe wind storms.

THE EXTRA SATURATION OF THE FELT. The tarred felt used in KOPPERS Roofs absorbs one and one-half times its own weight of coal tar pitch during saturation. This large proportion of saturant insures high strength and maximum durability.

PRESERVATIVE AND NON-CORROSIVE ACTION. KOPPERS Old Style Pitch contains coal tar creosote, which is unsurpassed as a preservative for wood, felt or other materials which are used in roofing construction. It contains no mineral acids, alkalies, or corrosive substances and therefore cannot corrode metal surfaces with which it may come in contact.

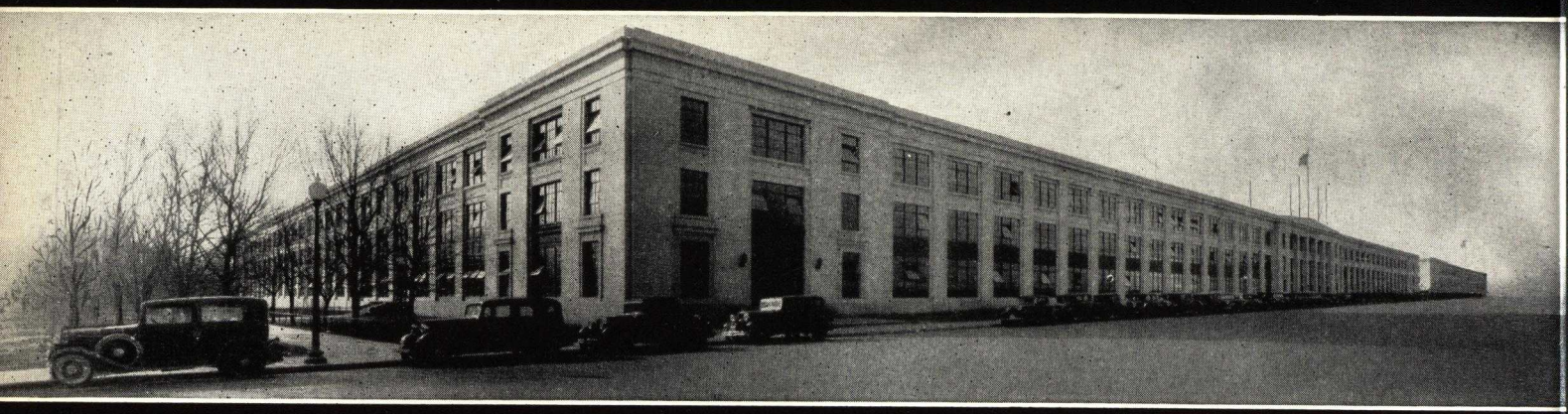
WEIGHTS, CONTAINERS, ETC. KOPPERS Old Style Pitch is sold in barrels or metal containers, 450 to 500 lbs.

KOPPERS Tarred Felts are sold in standard size rolls, 32 inches wide and containing 432 square feet, except when otherwise specified. KOPPERS Approved Tarred Felt, the highest grade of roofing and waterproofing felt and the grade used in KOPPERS Bonded Roofs, has an approximate average weight of 15 lbs. per 100 sq. ft., or 65 lbs. per roll.

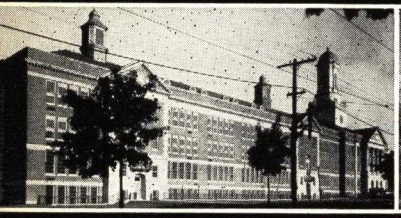
BOND. Maintenance Bonds on KOPPERS Roofing and Flashings are issued by Koppers Company and the National Surety Corporation on roofs constructed according to Koppers specifications and when applied by roofing contractors approved in writing by Koppers Company. When KOPPERS Bonded Roofing with KOPPERS Bonded Flashings are specified, this company will have an inspector on the job to see that it is constructed according to the specifications. The bond protects the building owner against any roofing maintenance expense due to leakage for the period of the bond. It is issued for 10, 15 or 20 years.

Note—*Koppers Company will issue Guarantee Roofing Bonds in such portions of the United States as are covered by its inspection service.*

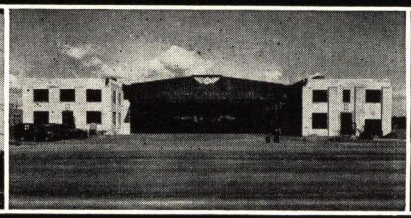
PROMINENT BUILDINGS ON WHICH KOPPERS ROOFING



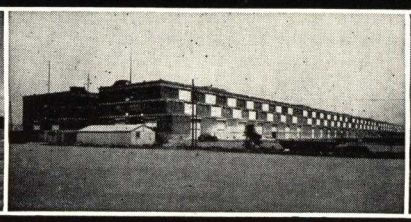
Navy and Munitions Building, Seventeenth and B, Southwest, Washington, D. C.



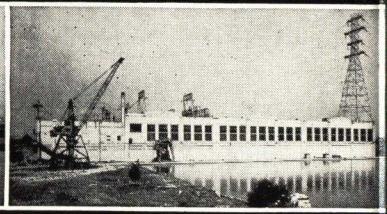
Hope Street High School, Providence, R. I.



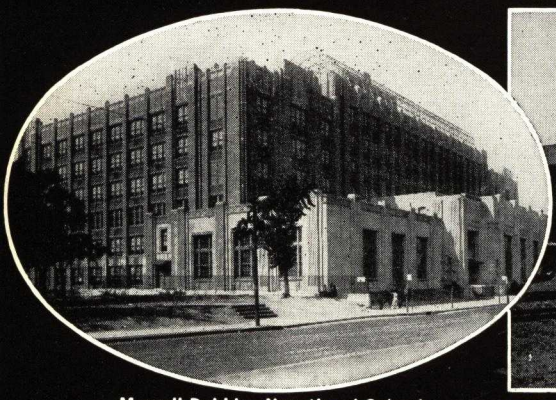
43rd Division, National Guard Hangar Bldg., Brainard Field, Hartford, Connecticut



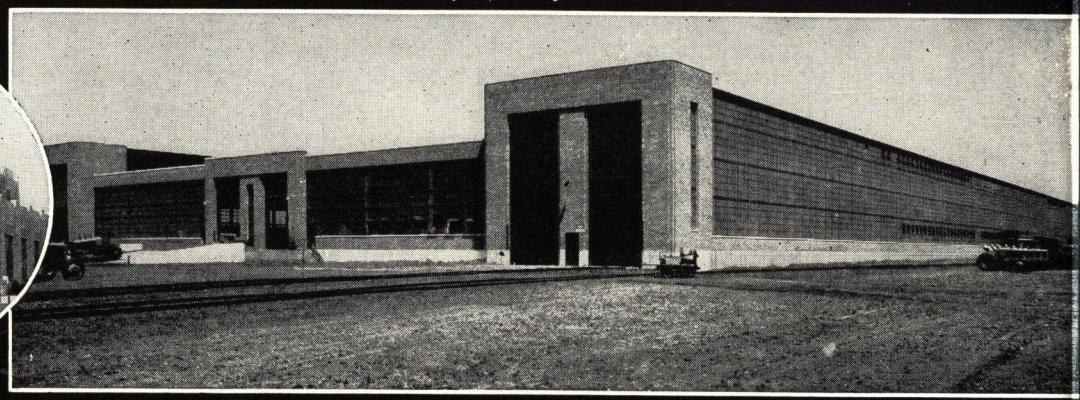
Pier 98, United States Maritime Commission, Philadelphia, Pennsylvania



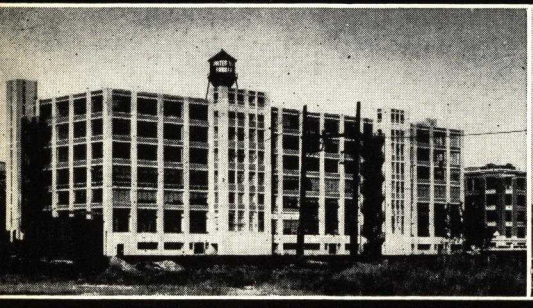
Hydro Electric Plant, Louisville, Kentucky



Murrell Dobbins Vocational School, Philadelphia, Pennsylvania



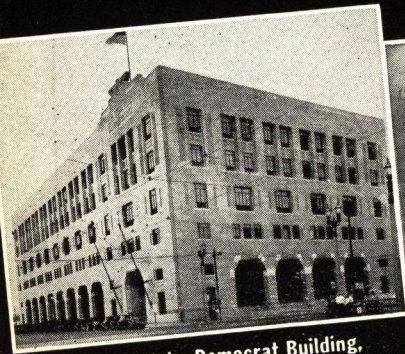
Allis-Chalmers Company, Tractor Assembly Building No. 4, Springfield, Illinois



United States Rubber Company, Passaic, New Jersey

Merchants and Manufacturers Bldg., Houston, Texas

Indiana State Library and Historical Building, Indianapolis, Indiana



St. Louis Globe-Democrat Building, St. Louis, Missouri

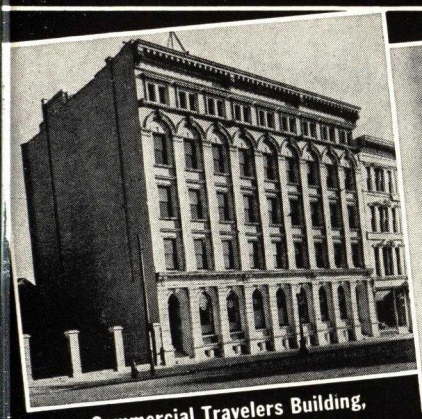
Ward Baking Company, Cleveland, Ohio

Trico Products Company, Buffalo, New York

Liberty Mutual Insurance Company Bldg., Boston, Massachusetts

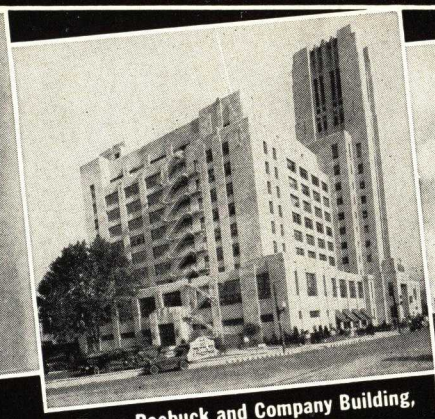
KOPPERS ROOFING SPECIFICATIONS

OR WATERPROOFING MATERIALS HAVE BEEN APPLIED

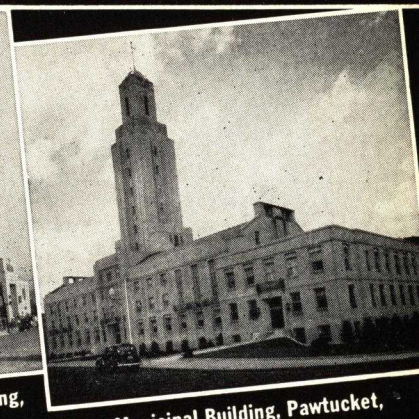


Commercial Travelers Building, Utica, New York

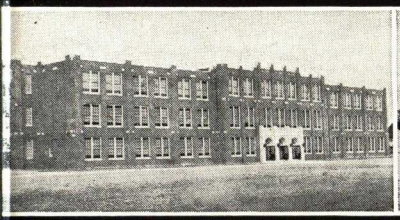
Apartment, 895 Park Avenue, New York City



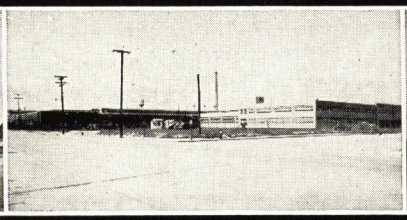
Sears Roebuck and Company Building, Memphis, Tennessee



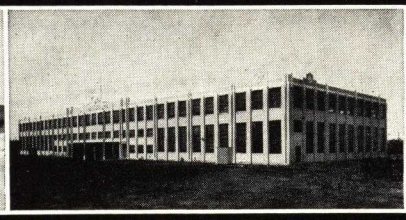
Municipal Building, Pawtucket, Rhode Island



Central High School, Greensboro, North Carolina

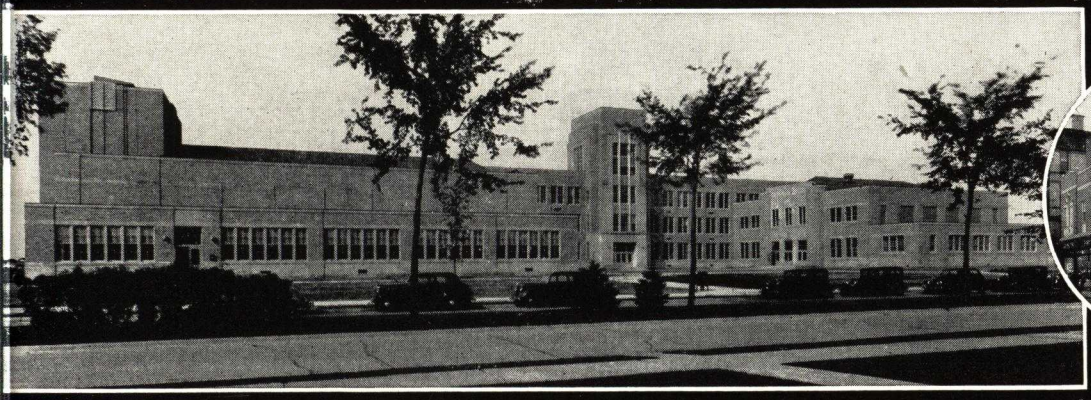


Firestone Tire and Rubber Company, Memphis, Tennessee

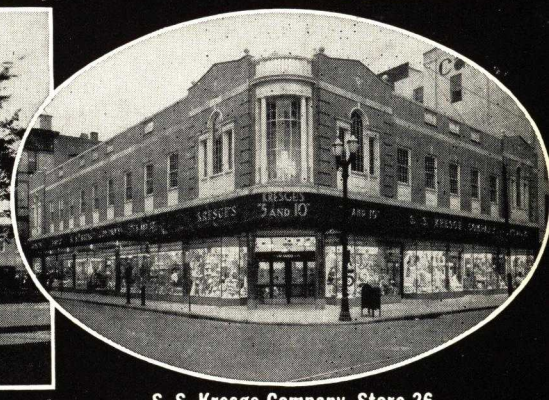


Westinghouse Electric & Manufacturing Co., Newark, New Jersey

Long-Lewis Hardware Company, Birmingham, Alabama



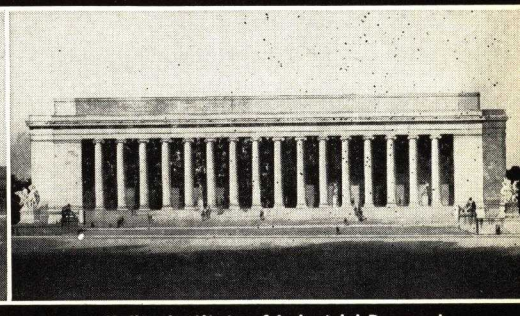
North Side Senior High School, Sheboygan, Wisconsin



S. S. Kresge Company, Store 26, Springfield, Massachusetts

Neisner Brothers Store 105, Springfield, Mass.

United States Post Office, Rochester, New York



Mellon Institute of Industrial Research, Pittsburgh, Pennsylvania

Pennsylvania Railroad Freight Station, Chicago, Illinois

State Police Administration Building, Hartford, Conn.

KOPPERS ROOFING SPECIFICATIONS

PROMINENT BUILDINGS ON WHICH KOPPERS ROOFING

6/8

NAME	LOCATION	ROOFER	ARCHITECT
Lincoln Mills	Huntsville, Ala.	G. R. Maples	Robert and Company
Medical Arts Building	Birmingham, Ala.	Hahn Roofing and Heating Co.	C. H. McCauley
Southern Railway Shops	Birmingham, Ala.	Hahn Roofing and Heating Co.	Owners
Twickenham Hotel	Huntsville, Ala.	Leon Taylor Roofing Company	Owner
North Little Rock High School	North Little Rock, Ark.	Williams Roofing Company	Mann, Wanger and King
State A. M. and N. School	Pine Bluff, Ark.	Williams Roofing Company	Thompson Sanders and Ginnochio
A. T. and S. F. Railway Co. Roundhouse	La Junta, Colo.	Lydick Roofing Company	Company Engineer
International Harvester Company Garage	West Haven, Conn.	Hartford Roofing and Sheet Metal Company	Owner
United Illuminating Company	New Haven, Conn.	James Wilson Roofing Company	Westcott and Mapes
G. F. Heublein Inc. Warehouse and Distillery	Hartford, Conn.	Hartford Roofing and Sheet Metal Company	Carl J. Malmfeldt
Bridgeport Brass Co. Add. Casting Shop	Bridgeport, Conn.	Thompson Roofing Company	Fletcher and Thompson, Inc.
State of Connecticut State Police Barracks and Administration Building	Hartford, Conn.	Hartford Roofing and Sheet Metal Company	Golden-Storrs Company
United Illuminating Company	Bridgeport, Conn.	James Wilson Roofing Company	Westcott and Mapes
City Hall	Torrington, Conn.	Hartford Roofing and Sheet Metal Company	Carl Victor Johnson
Central Grammar School	Milford, Conn.	Thompson Roofing Company	Owners
State of Connecticut 43rd Division National Guard Air Service Bldg. (Hangar)	Brainard Field—Hartford, Conn.	Hartford Roofing and Sheet Metal Company	Payne and Keefe
Bead Chain Company	Bridgeport, Conn.	James E. Kelley and Sons	Walter John Skinner
High School	Stafford Springs, Conn.	Hartford Roofing and Sheet Metal Company	Golden-Storrs Company
Yale University—Dining Hall Vanderbilt Sheffield Dormitory	New Haven, Conn.	Joseph E. Lyons	Owners
Laurel High School	Laurel, Del.	Roofing and Improvement Co.	Guilbert and Bettelle
Sanitary Commission Building	Washington, D. C.	N. W. Martin and Brother	Howard Cutler
N. Street Apartments	Washington, D. C.	N. W. Martin and Brother	A. C. Minnix
Southern Railway Office Building	Washington, D. C.	Ironclad Roofing Company	Waddy B. Wood
District of Columbia School	Washington, D. C.	Ironclad Roofing Company	N. C. Wyeth
Government Printing Office Building No. 3	Washington, D. C.	Irvin Prickett	N. C. Wyeth
Dunson Mills	LaGrange, Ga.	Newnan Construction Company	J. E. Sirrine Company
J. I. Case Company	Atlanta, Ga.	Chas. N. Walker Roofing Co.	Owners
Fernandina Pulp and Paper Company	Fernandina, Fla.	Warren Ehret Company	Owners
International Harvester Company (Various Buildings)	Chicago, Ill.	Knickerbocker Roofing and Paving Company	Owner
McGraw Electric Company	Elgin, Ill.	Jacobson Roofing Company	Olsen and Urbain
General Foods Company	Kankakee, Ill.	Advance Roofing and Sheet Metal Company	James Stewart Corporation
John Deere Company	Moline, Ill.	R. C. Harrington Company	Owner
Pullman Standard Car Manufacturing Co.	Chicago, Ill.	Culver Roofing Company and J. E. Harris Company	Owner
Kraft-Phenix Cheese Company	Chicago, Ill.	Knauf and Weber	Mundie, Jensen, Bourke and Havens
Thompson Wire Company	Chicago, Ill.	Chicago Roofing and Supply Co.	Austin Company
Pittsfield Building	Chicago, Ill.	M. W. Powell Company	Graham, Anderson, Probst and White
General Motors Company	Chicago, Ill.	Luse-Stevenson Company	Owner
Prest-O-Lite Company	Indianapolis, Ind.	Ralph R. Reeder and Sons, Inc.	Owner
Central Catholic High School	Fort Wayne, Ind.	Dahm Brothers, Inc.	A. M. Straus
Owens-Illinois Glass Company	Gas City, Ind.	Ralph R. Reeder and Sons, Inc.	Owner
University of Indiana	Bloomington, Ind.	Ralph R. Reeder and Sons, Inc.	A. M. Straus
Linde Air Products Company	Indianapolis, Ind.	Ralph R. Reeder and Sons, Inc.	O. A. Tislow
Brown-Williamson Tobacco Corporation	Louisville, Ky.	Samuel F. Troxell Company	Owner
Falls City Brewing Company	Louisville, Ky.	Samuel F. Troxell Company	Walter C. Wagner
Catholic Orphanage Asylum	Anchorage, Ky.	Samuel F. Troxell Company	D. X. Murphy Brothers
Louisville Gas and Electric Company	Louisville, Ky.	Samuel F. Troxell Company	Byllesby Engineering and Management Corporation
Sears Feibleman Company	New Orleans, La.	J. J. Clarke Company	Moise Goldstein
Gymnasium, Crowley High School	Crowley, La.	Favrot Roofing and Supply Co.	F. W. Nolan
Addition, Fredericks Hotel	New Iberia, La.	Favrot Roofing and Supply Co.	F. W. Nolan
Boys Club	Portland, Me.	M. B. Bourne and Son	J. C. and J. H. Stevens
Canal National Bank	Portland, Me.	M. B. Bourne and Son	John P. Thomas
Gulf Oil Corporation Service Station	Calais, Me.	John A. Roberts	Owners
Baltimore Pure Rye Distillery	Baltimore, Md.	Pen Mar Company	L. A. Herstein, Jr.
Northwood Gardens Apartments	Baltimore, Md.	Pen Mar Company	John Ahlers
Dundalk Housing Project	Dundalk, Md.	Pen Mar Company	Wortman and Eiser
Merchants Terminal Corporation	Baltimore, Md.	John O. White Company	J. H. Wilkersham
Union Shipbuilding Corporation	Curtis Bay, Md.	Wallace and Gale Company	Owner
Davidson Chemical Company	Baltimore, Md.	Pen Mar Company	Owner
Engineering Research Corporation	Riverdale, Md.	Gichner, Inc.	Owner
Liberty Mutual Insurance Company Bldg.	Boston, Mass.	Burgess and Blacher Company	Chester Lindsey Churchill
New Towne Court—Federal Housing Project	Cambridge, Mass.	Highland Roofing and Sheet Metal Works	U. S. Federal Housing Authority
Westinghouse Electric and Manufacturing Company Warehouse Building	Springfield, Mass.	A. L. Freedman Company	Prack and Prack
Westinghouse Electric and Manufacturing Company Metal Fabricating Building	Springfield, Mass.	A. L. Freedman Company	Prack and Prack
Radcliffe College—Dormitory	Boston, Mass.	Highland Roofing and Sheet Metal Works	Ames and Dodge
Worcester Art Museum	Worcester, Mass.	George A. Barnard Company	Wm. T. Aldrich
Sanitary Ice Company	Springfield, Mass.	H. C. Scheaffer Company	Owners
S. S. Kresge Company Store No. 26	Springfield, Mass.	H. C. Scheaffer Company	Owners
Neiser Brothers, Inc., Store No. 105	Springfield, Mass.	H. C. Scheaffer Company	Owner
Gulf Oil Corporation—Bulk Plant	Springfield, Mass.	H. C. Scheaffer Company	Owners
Northboro High School	Northboro, Mass.	Eagle Roofing and Skylight Works	Morse, Dickinson and Goodwin
Middlesex National Bank	Malden, Mass.	Eagle Roofing and Skylight Works	Owners
Masonic Temple	Braintree, Mass.	Paul E. Dutelle and Company	Owner
Junior and Senior High School	Plymouth, Mass.	Commonwealth Roofing Co.	Frank Irving Cooper Corporation
High School	Bellingham, Mass.	Commonwealth Roofing Co.	Frank Irving Cooper Corporation
Y. M. C. A. Addition	Worcester, Mass.	Louis Cutler Roofing Company	Frost, Chamberlain and Edwards
Elk's Club No. 1426	Gardner, Mass.	Beaudet Roofing Company	Oscar A. Thayer
Lever Brothers—Glycerine Plant	Cambridge, Mass.	Burgess and Blacher Company	Stone and Webster
Uxbridge Savings Bank	Uxbridge, Mass.	P. Power	Hutchins and French
LaChoy Food Products	Detroit, Mich.	Schreiber Brothers Roofing Co.	Giffels and Vallet, Inc.
Detroit Rex Products Company	Detroit, Mich.	Mackenson Roofing Company	The Austin Company
City of Ann Arbor—Water Department	Ann Arbor, Mich.	Schreiber Brothers Roofing Co.	Fry and Kasurin
Coca-Cola Bottling Company	Detroit, Mich.	Mackenson Roofing Company	Giffels and Vallet, Inc.
Firestone Tire and Rubber	Traverse City, Mich.	Glendon A. Richards Company	Owner
Ford Motor Company	St. Paul, Minn.	Luse-Stevenson Company	Owner
International Harvester Company	St. Cloud, Minn.	W. S. Nott Company	Owner
Standard Life Insurance Company	Jackson, Miss.	Ray Wright Roofing and Sheet Metal Works	N. W. Overstreet
Masonic Home of Missouri	St. Louis, Mo.	St. Clair Roofing Company	Wm. B. Ittner, Inc.
S. W. Bell Telephone Garage	Kirkwood, Mo.	Biebel Brothers Roofing	Owner
Junior High School and Gymnasium	St. Charles, Mo.	Insulating and Materials Co.	Wm. B. Ittner, Inc.
Morton School	Hastings, Neb.	J. H. Still and Company	M. L. Evans
Gulf Oil Corporation Service Station	Hanover, N. H.	A. C. Hathorne Company	Owners
Union Leader Publishing Company	Manchester, N. H.	M. J. Murphy	Lockwood, Greene, Inc.
Gulf Oil Corporation Service Station	Portsmouth, N. H.	A. Belanger and Son	Owners
General Motors Corporation	Linden, N. J.	M. H. Donovan and Company	Albert Kahn
New York Central Railroad	Weehawken, N. J.	Cooper and Company	Owner
United States Rubber Company	Passaic, N. J.	T. F. Sloan Company	Lockwood, Greene, Inc.

6

NAME	LOCATION	ROOFER	ARCHITECT
National Bearing Metals Corporation	Jersey City, N. J.	A. Ratner and Company	Leroy Cowan
Linde Air Products Company	Buffalo, N. Y.	Jos. A. Sanders and Sons, Inc.	Owners
Wickwire-Spencer Steel Company	Buffalo, N. Y.	Jos. A. Sanders and Sons, Inc.	Owners
The J. N. Adams Company	Buffalo, N. Y.	Jos. A. Sanders and Sons, Inc.	Starrett and Van Vleck, R. A.
The H. Clapp Company	Rochester, N. Y.	George Ballard	S. Firestone, R. A.
The Halloid Company	Rochester, N. Y.	Flesch and Schmitt	S. Firestone, R. A.
The Crouse-Hinds Company	Syracuse, N. Y.	Sheridan Roofing Company	Gaggin and Gaggin
The Commercial Travelers Insurance Co.	Utica, N. Y.	R. A. Bennett	Gouge and Ames, R. A.
International Harvester Sales and Service Building	Long Island City, N. Y.	New York Roofing Company	Owners
Federal Office Building	New York City, N. Y.	New York Roofing Company	Owner
New York State Supreme Court—Appellate Term Division	Brooklyn, N. Y.	Brooklyn Roofing Corporation	Slee and Bryson
Kings County Hospital—Staff Building	Brooklyn, N. Y.	Brooklyn Roofing Corporation	LeRoy P. Ward
New York State Building, Amphitheatre and Island Stage World's Fair (Permanent Buildings)	New York City, N. Y.	Brooklyn Roofing Corporation	Sloan and Robertson
Kings County Hospital—Main Building	Brooklyn, N. Y.	Sobel and Kraus	LeRoy P. Ward
Beacon Grade School	Beacon, N. Y.	Henry A. Olson, Inc.	Tooker and Marsh
Red Hook High and Grade School	Red Hook, N. Y.	Henry A. Olson, Inc.	R. L. Sluyter
Glen Cove High School	Glen Cove, Long Island, N. Y.	United Roofing and Waterproofing Co. (Globe Skylight and Roofing Co. combined)	Tooker and Marsh
Brooklyn College	Brooklyn, N. Y.	United Roofing and Waterproofing Co. (Globe Skylight and Roofing Co. combined)	Corbett, Harrison and MacMurray—Randolph Evans, Associated
Lawrence High School	Lawrence, Long Island, N. Y.	United Roofing and Waterproofing Co. (Globe Skylight and Roofing Co. combined)	L. J. Lincoln
Cedarhurst High School	Cedarhurst, Long Island, N. Y.	United Roofing and Waterproofing Co. (Globe Skylight and Roofing Co. combined)	L. J. Lincoln
Hewlett High School	Hewlett, Long Island, N. Y.	United Roofing and Waterproofing Co. (Globe Skylight and Roofing Co. combined)	L. J. Lincoln
Malverne High School	Malverne, Long Island, N. Y.	United Roofing and Waterproofing Co. (Globe Skylight and Roofing Co. combined)	F. C. Weidersum
United States Customs House	New York City, N. Y.	Ashford Roofing Company	Owner
F. W. Woolworth Company	Charlotte, N. C.	Interstate Roofing and Asphalt Company	Walter W. Hooks
Hickory Theatre	Hickory, N. C.	F. B. Ingold	J. H. Marsh
Lucky Strike Factory	Durham, N. C.	Budd-Piper Roofing Company	Owner
DeVilbiss High School	Toledo, Ohio	Schreiber Roofing Company	Edwin Gee
Seiberling Rubber Company	Barberton, Ohio	Akers and Harpham	Owner
The May Company	Cleveland, Ohio	A. L. Sacheroff	Graham, Anderson, Probst and White
Loose-Wiles Baking Co.—Carton Plant	Dayton, Ohio	Schriber Sheet Metal and Roofers	Owner
Olney School	Toledo, Ohio	Joyce Associates	W. Howard Manor
General Electric Company	Cleveland, Ohio	Industrial Roofing and Sheet Metal, Inc.	Owner
J. C. Penney Co., Inc.	Tulsa, Okla.	Corson Roofing Company	Owner
Frisco Union Depot	Oklahoma City, Okla.	C. C. Cooke Company	Owner
City Incinerator Plant	Wilkes-Barre, Pa.	Scholey and Company	Nusbaumer and Clarke, Inc.
Murrell Dobbins School	Philadelphia, Pa.	Benjamin Foster Company	Irwin T. Catherine
SKF Industries, Ltd.	Philadelphia, Pa.	Benjamin Foster Company	Owner
F. W. Woolworth Stores	Philadelphia, Pa.	Martin and Breen Company	Owner
Robert Fulton Elementary School	Philadelphia, Pa.	T. S. Johnsons Sons	Irwin T. Catherine
George Washington Grade School	Philadelphia, Pa.	T. S. Johnsons Sons	Irwin T. Catherine
Aronomink Grade School	Philadelphia, Pa.	W. Jay Tinney Company	Heacock and Hokanson
Eastern Penitentiary	Gratersford, Pa.	Warren Ehret Company	Henry D. Dagit and Son
Allentown State Hospital	Allentown, Pa.	Allentown Roofing Company	Lovlace and Spillman
Scranton State Hospital	Scranton, Pa.	Edwin R. Huddy and Sons	John J. Howley
Roosevelt High School	Kulpmont, Pa.	Elkwood Roofing Company	Davis and Rice
Norristown State Hospital	Norristown, Pa.	Benjamin Foster Company	H. L. Shay
Pennsylvania Railroad Roundhouse	Harrisburg, Pa.	Warren Ehret Company	Owner
Girardville School	Girardville, Pa.	Allentown Roofing Company	D. H. Grootenboer
State Farm Show Buildings	Harrisburg, Pa.	W. F. Overly and Sons	Lowrie and Green
University of Pittsburgh — Cathedral of Learning	Pittsburgh, Pa.	Chas. H. Hahn	Owen D. Stephens
Allegheny County Home	Woodville, Pa.	Warren Ehret Company	J. Lawrence Hopp
United States Bureau of Mines	Pittsburgh, Pa.	Tri-State Roofing Company	Lawrence Wolf
State Highway Garage	Mercer, Pa.	Warren Ehret Company	Owner
Pittsburgh and Lake Erie Railroad—Train Sheds	Pittsburgh, Pa.	Warren Ehret Company	Owner
Westinghouse Electric and Manufacturing Company Warehouse	Pittsburgh, Pa.	Warren Ehret Company	Owner
Hookless Fastener Co., Building "D"	Meadville, Pa.	Warren Ehret Company	Owner
City Incinerator Building	Providence, R. I.	J. W. Moore Company	Owner
Hope Street High School	Providence, R. I.	Eagle Cornice Company	Owner
North Providence High School	North Providence, R. I.	Eagle Cornice Company	Milton F. MacIntosh
United Electric Railway Company	Providence, R. I.	Maguire Roofing Company	Owners
Providence Journal Building	Providence, R. I.	M. N. Cartier and Sons Co.	Albert Kahn
Pittsburgh Plate Glass Co. Warehouse	Providence, R. I.	Eagle Cornice Company	John F. Hogan
R. I. State—Department of Police	Richmond, R. I.	Maguire Roofing Company	Michael Traficante
Fire Station No. 1	East Providence, R. I.	George L. Parker Company	Jackson, Robertson and Adams
West Virginia Pulp and Paper Company	Charleston, S. C.	Ramseur Roofing Company	Owners
Mollohon Mills	Newberry, S. C.	Ramseur Roofing Company	Lockwood Greene Company
Appleton Mills	Anderson, S. C.	J. Roy Martin	J. E. Sirrine Company
Woodruff High School	Woodruff, S. C.	Builders Roofing Company	Owner
Winnsboro Mills	Winnsboro, S. C.	J. Roy Martin	Owner
Coca-Cola Plant	Nashville, Tenn.	Leon Taylor Roofing Company	Robert and Company
Hedges-Walsh Weidner Company	Chattanooga, Tenn.	Tom Snow Roofing Company	Owner
State of Texas Building	Dallas, Tex.	Dallas Roofing Company	Owner
Schools	Denton, Tex.	Dallas Roofing Company	Owner
U. S. Post Office and Customs House	St. Albans, Vt.	Hartford Roofing and Sheet Metal Company	U. S. Government
Tidewater Oil Company Bulk Plant	Rutland, Vt.	L. A. Marsh	Owners
E. E. Dickey—French Block	Montpelier, Vt.	Harry Aaron	E. E. Eisenberg
Gulf Oil Corporation Lubritorium	Barre, Vt.	A. C. Hawthorne Company	Owners
Marble Savings Bank — Economy Warehouse	Rutland, Vt.	L. A. Marsh	Owner
Collins Theatre	St. Albans, Vt.	Hartford Roofing and Sheet Metal Company	Mowl and Rand
Bell Telephone Building	Clarendon, Va.	Ironclad Roofing Company	Merrill C. Lee
Presidential Apartments	Alexandria, Va.	N. W. Martin and Brother	Frances Knee
Episcopal High School Gymnasium	Alexandria, Va.	Virginia Roofing and Sheet Metal Company	Busterville and Son
Arlington County School	Arlington, Va.	Rose Brothers	Virginia Board of Education
City Wharf Buildings	Richmond, Va.	Piper Roofing Company	Owner
Factory Building—Linde Air Products	Norfolk, Va.	Odenhal-Monks	Owner
Chesapeake and Ohio Railway Company	Huntington, W. Va.	West Virginia-Kentucky Hardware and Supply Co.	Owner
Carbide and Carbon Chemicals Corp.	So. Charleston, W. Va.	J. E. Harris Company	Owner
Allis-Chalmers Company	Milwaukee and LaCrosse, Wis.	F. J. A. Christiansen Roofing Co.	Owner
Rufus King High School	Milwaukee, Wis.	F. J. A. Christiansen Roofing Co.	Owner

5 PLY OVER WOOD DECKS

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 1

(Maximum Incline Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be clean, smooth and free from knot holes, large cracks, and loose boards. The lumber shall be seasoned or treated. If the roof deck is inclined it shall be properly sloped to the outlets.

APPLICATION OF ROOFING MATERIAL. First—Lay one (1) thickness of sheathing paper, weighing not less than five (5) pounds per one hundred (100) square feet, lapping each sheet one (1) inch over the preceding sheet.

Second—Lay over the entire surface two (2) full thicknesses of Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet. Nail as often as necessary to hold the sheets in place and until the remaining felt is laid.

Third—Apply over the entire surface a uniform coating of Old Style Pitch.

Fourth—Lay over the entire surface three (3) full thicknesses of Tarred Felt, lapping each sheet twenty-two (22) inches over the preceding sheet and mopping with Old Style Pitch the full width of the twenty-two (22) inch lap, so that in no place shall felt touch felt. Each sheet shall be nailed not less than two (2) inches from the upper edge, nails to be spaced not more than two (2) feet apart. When the Felts are lapped as indicated, all nails are covered by not less than two plies of Felt.

Fifth—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt, and from one-fourth (¼) inch to five-eighths (⅝) inch in size.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet. Nailing of all felts, shall be done with simplex flat head roofing nails or with seven-eighths (⅞) inch galvanized roof nails driven through flat tin discs.

For each one hundred (100) square feet of completed roofing surface there shall be used not less than one hundred and fifty (150) pounds of Old Style Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350) degrees F. in hot weather.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer, and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Maintenance Bond to the owner.

FLASHING. For 20-year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 200 and No. 201.

4 PLY OVER WOOD DECKS

KOPPERS 15-YEAR BUILT UP ROOFING SPECIFICATION NO. 2

(Maximum Incline Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be clean, smooth and free from knot holes, large cracks and loose boards. The lumber shall be seasoned or treated. If the roof deck is inclined it shall be properly sloped to the outlets.

APPLICATION OF ROOFING MATERIAL. First—Lay one (1) thickness of sheathing paper, weighing not less than five (5) pounds per one hundred (100) square feet, lapping each sheet one (1) inch over the preceding sheet.

Second—Lay over the entire surface two (2) full thicknesses of Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet. Nail as often as necessary to hold the sheets in place and until the remaining felt is laid.

Third—Apply over the entire surface a uniform coating of Old Style Pitch.

Fourth—Lay over the entire surface two (2) full thicknesses of Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet and mopping with Old Style Pitch the full width of the seventeen (17) inch lap, so that in no place shall felt touch felt. Each sheet shall be nailed not less than two (2) inches from the upper edge, nails to be spaced not more than two (2) feet apart.

Fifth—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt, and from one-fourth (¼) inch to five-eighths (⅝) inch in size.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet. Nailing

of all felts shall be done with simplex flat head roofing nails or with seven-eighths (⅞) inch galvanized roof nails driven through flat tin discs.

For each one hundred (100) square feet of completed roofing surface there shall be used not less than one hundred and twenty-five (125) pounds of Old Style Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 15-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the roofing manufacturer, and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 15-Year Surety Maintenance Bond to the owner.

FLASHING. For 15-year Flashing refer to Specification No. 106.

INSULATION. Refer to Specifications No. 200 and No. 201.

STEEP SLAG 5 PLY OVER WOOD DECKS

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 3

(Maximum Incline Six (6) Inches Per Foot and Not Less Than Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be of seasoned or treated lumber.

APPLICATION OF ROOFING MATERIAL. First—Lay one thickness of sheathing paper weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheet one (1) inch. The sheathing paper shall be nailed sufficiently to hold it in place during application of the roofing.

Second—Lay over the entire surface five (5) full thicknesses of Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-six (26) inches over preceding sheet. Each sheet shall be nailed with one (1) inch barbed roofing nails through flat tin discs, each eight (8) inches from the upper edge. Nails shall be spaced not more than one (1) foot apart.

Third — Each sheet shall be mopped for a distance of twenty-four (24) inches with Steep Roofing Pitch. The felt shall be firmly embedded into the hot moppings as applied. Care shall be taken that the pitch moppings are even with lower edge of each overlying sheet, and that the finished felt surface is free of pitch drippage.

Fourth—Over the entire surface, pour a uniform coating of Steep Roofing Pitch into which, while hot, firmly embed not less than two hundred and seventy-five (275) pounds of slag for each one hundred (100) square feet of completed roofing. The slag shall be from one-fourth (¼) inch to five-eighths (⅝) inch in size, shall be dry and free from dirt. If roofing is applied during cool weather, or slag is damp, slag shall be heated and dried, so that it is warm when applied to the roof. The slag surfacing shall be firmly embedded into the surface coating. The finished surface shall be broomed clean of all loose slag.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

For each one hundred (100) square feet of completed roofing surface there shall be not less than eighty (80) pounds of pitch for felt moppings and not less than fifty (50) pounds nor more than sixty (60) pounds for embedding the slag. Pitch shall not be heated above three hundred and fifty (350°) degrees F. in cool or cold weather and not above three hundred and twenty-five (325°) degrees F. in hot weather.

Where steep roofing joins the flat roof, the roofing on the flat surface shall be carried up the inclined surface not less than twenty-four (24) inches before the steep roofing is applied. Slag stops at gutters shall extend one and one-alf (1½) inches above the roof deck.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to above specifications.

BOND. (If a 20-year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-year Surety Maintenance Bond to the owner.

FLASHING. For 20-year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 200 and No. 201.

STEEP SLAG 4 PLY OVER WOOD DECKS

KOPPERS 15-YEAR BUILT UP ROOFING SPECIFICATION NO. 25

(Maximum Incline Six (6) Inches Per Foot and Not Less Than Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be of seasoned or treated lumber.

APPLICATION OF ROOFING MATERIAL. First—Lay one thickness of sheathing paper weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheet one (1) inch. The sheathing paper shall be nailed sufficiently to hold it in place during application of the roofing.

Second—Lay over the entire surface four (4) full thicknesses of Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-four and one-half (24½) inches over preceding sheet. Each sheet shall be nailed with one (1) inch barbed roofing nails through flat tin discs, each eight (8) inches from the upper edge. Nails shall be spaced not more than one (1) foot apart.

Third — Each sheet shall be mopped for a distance of twenty-two and one-half (22½) inches with Steep Roofing Pitch. The felt shall be firmly embedded into the hot moppings as applied. Care shall be taken that the pitch moppings are even with lower edge of each overlying sheet, and that the finished felt surface is free of pitch drippage.

Fourth—Over the entire surface, pour a uniform coating of Steep Roofing Pitch into which, while hot, firmly embed not less than two hundred and seventy-five (275) pounds of slag for each one hundred (100) square feet of completed roofing. The slag shall be from one-fourth (¼) inch to five-eighths (⅝) inch in size, shall be dry and free from dirt. If roofing is applied during cool weather, or slag is damp, slag shall be heated and dried, so that it is warm when applied to the roof. The slag surfacing shall be firmly embedded into the surface coating. The finished surface shall be broomed clean of all loose slag.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

For each one hundred (100) square feet of completed roofing surface there shall be not less than sixty (60) pounds of pitch for felt moppings and not less than fifty (50) pounds nor more than sixty (60) pounds for embedding the slag. Pitch shall not be heated above three hundred and fifty (350°) degrees F. in cool or cold weather and not above three hundred and twenty-five (325°) degrees F. in hot weather.

Where steep roofing joins the flat roof, the roofing on the flat surface shall be carried up the inclined surface not less than twenty-four (24) inches before the steep roofing is applied. Slag stops at gutters shall extend one and one-half (1½) inches above the roof deck.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co. —— Co., —— Co., or approved equal applied according to above specifications.

BOND. (If a 15-year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 15-year Surety Maintenance Bond to the owner.

FLASHING. For 15-year Flashing refer to Specification No. 106.

INSULATION. Refer to Specifications No. 200 and No. 201.

STEEP MINERAL SURFACED ROOFING OVER WOOD DECKS

KOPPERS 10-YEAR BUILT UP ROOFING SPECIFICATION NO. 4

(For Inclines Exceeding Four (4) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The lumber shall be seasoned or treated.

APPLICATION OF ROOFING MATERIAL. First—Lay over the entire surface two (2) full thicknesses of Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet. The felt shall be laid across and not up and down the slope of the roof. Nail each sheet with one (1) inch barbed roofing nails through flat tin discs two (2) inches from the lower edge. Nails shall be spaced not more than eighteen (18) inches apart.

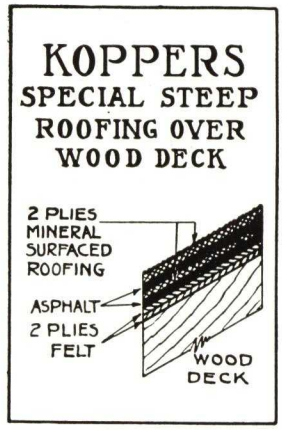
Second—Spread with a mop over the surface thus prepared a uniform coating of Steep Asphalt into which, while hot, embed a sheet of Mineral Surfaced Roofing, lapping each sheet the full nineteen (19) inch selvage. Sheets of mineral surfaced roofing shall be laid across and not up and down the slope of the roof, and shall be securely fastened in place along the selvage side with a double course of one (1) inch barbed roofing nails through flat tin discs, nails in each course to be spaced twelve (12) inches apart and courses staggered. Nailing course nearest the longitudinal center of the sheet shall be held back from the mineral surfacing two inches.

Third—Over the full width of the nineteen (19) inch selvage spread with a mop a uniform coating of Steep Asphalt into which, while hot, thoroughly embed the following sheet of Mineral Surfaced Roofing.

Fourth—There shall be a six (6) inch end lap between adjoining sheets. The underlying sheet of each end lap shall be nailed with eight (8) one (1) inch barbed roofing nails through flat tin discs. Nails to be spaced four (4) inches apart starting two (2) inches from the lower edge of each sheet. Coat the underside of six (6) inch end lap with Steep Asphalt and firmly embed the overlapping sheet.

All edges and end laps shall be carefully rubbed down.

GENERAL. Mineral surfaced roofing shall be cut in strips not exceeding twenty (20) feet in length and shall be stacked flat.



All felts and mineral surfaced roofing shall be laid without wrinkles or buckles. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

For each one hundred (100) square feet of completed roofing surface there shall be used not less than fifty (50) pounds of Steep Asphalt. Asphalt shall not be heated above three hundred, seventy-five (375°) degrees F.

Where the steep roof joins the flat roof, the roofing in the flat surface shall be carried up the inclined surface not less than twenty-four (24) inches before the steep roofing is applied. Special Steep Bonded Roofing is to be applied in connection with Bonded Flat Roofing.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 10-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer, and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 10-Year Surety Maintenance Bond to the owner.

FLASHING. For 10-Year Flashing refer to Specification No. 101.

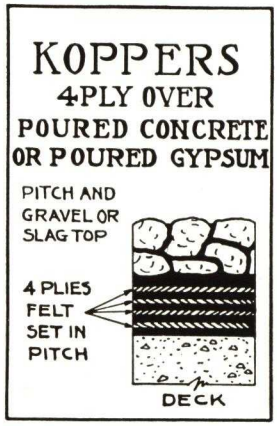
4 PLY OVER POURED CONCRETE OR POURED GYPSUM

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 5

(Maximum Incline Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, dry, firm and clean, and if inclined shall be properly sloped to outlets.

Decks of inclines exceeding one (1) inch and less than two (2) inches to the foot shall permit nailing, or creosoted wood nailing strips must be set in the concrete flush with its surface, these strips to be spaced three (3) feet apart and placed up and down and not across the slope of the roof.



APPLICATION OF ROOFING MATERIAL. First—Apply a uniform coating of Old Style Pitch to the deck.

Second—Lay over the entire surface four (4) full thicknesses of Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over the preceding sheet, mopping with Old Style Pitch the full twenty-four and one-half (24½) inches on each sheet so that in no place shall felt touch felt.

When nailing is necessary nails should be placed not less than three (3) inches from the upper edge of each sheet and not more than three (3) feet apart. All nails shall be covered by not less than three (3) plies of felt.

All felts shall be laid without wrinkles or buckles.

Third—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt, and from one-fourth (¼) inch to five-eighths (⅝) inch in size.

GENERAL. For each one hundred (100) square feet of completed roofing there shall be used not less than two hundred (200) pounds of Old Style Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather. Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer, and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the owner.

FLASHING. For 20-Year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 203 and No. 202.

4 PLY OVER POURED CONCRETE OR POURED GYPSUM

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 6

(Maximum Incline One-Quarter (¼) Inch Per Foot)

This specification is to be used only when the maximum incline is one-quarter (¼) inch per foot. When the incline exceeds one-quarter (¼) inch per foot, use specification No. 5.

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, dry firm and clean.

APPLICATION OF ROOFING MATERIAL. First—Apply a uniform coating of Old Style Pitch to the deck.

Second—Lay over the entire surface two (2) plies of Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet, mopping with Old Style Pitch the full seventeen (17) inches on each sheet so that in no place shall felt touch felt.

Third—Apply a uniform coating of Old Style Pitch.

Fourth—Lay over the entire surface two (2) plies of Tarred Felt lapping each sheet seventeen (17) inches over the preceding sheet, mopping with Old Style Pitch the full seventeen (17) inches on each sheet so that in no place shall felt touch felt.

Fifth—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt and from one-fourth (¼) inch to five-eighths (⅝) inch in size.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet. For each one hundred (100) square feet of completed roofing there shall be used not less than two hundred (200) pounds of Old Style Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND (If a 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer, and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the owner.

FLASHING. For 20-Year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 203 and No. 202.

3 PLY OVER POURED CONCRETE OR POURED GYPSUM

KOPPERS 15-YEAR BUILT UP ROOFING SPECIFICATION NO. 7

(Maximum Incline Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, dry, firm and clean, and if inclined shall be properly sloped to outlets.

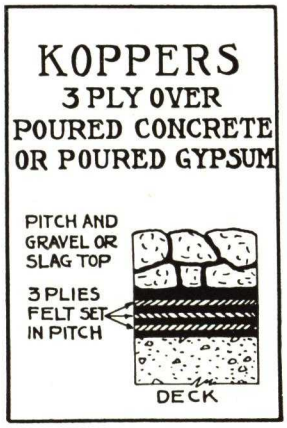
Decks or inclines exceeding one (1) inch and less than two (2) inches to the foot shall permit nailing, or creosoted wood nailing strips must be set in the concrete flush with its surface, these strips to be spaced three (3) feet apart and shall be placed up and down and not across the slope of the roof.

APPLICATION OF ROOFING MATERIAL—First—Apply a uniform coating of Old Style Pitch to the deck.

Second—Lay over the entire surface three (3) full thicknesses of Tarred Felt, lapping each sheet twenty-two (22) inches over the preceding sheet, mopping with Old Style Pitch the full twenty-two (22) inches on each sheet so that in no place shall felt touch felt.

When nailing is necessary nails shall be placed not less than three (3) inches from the upper edge of each sheet and not less than three (3) feet apart. All nails shall be covered by not less than two (2) plies of felt.

All felts shall be laid without wrinkles or buckles.



Third—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt, and from one-fourth (¼) inch to five-eighths (⅝) inch in size.

GENERAL. For each one hundred (100) square feet of completed roofing there shall be used not less than one hundred and seventy-five (175) pounds of Old Style Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal according to the above specifications.

BOND. (If a 15-Year Guarantee Maintenance Bond is required) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer, and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 15-Year Surety Maintenance Bond to the owner.

FLASHING. For 15-Year Flashing refer to Specification No. 106.

INSULATION. Refer to Specifications No. 203 and No. 202.

6
8

STEEP SLAG 4 PLY OVER POURED CONCRETE OR POURED GYPSUM

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 8

(Maximum Incline Six (6) Inches Per Foot and Not Less Than Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, dry, firm, clean and should be suitable for nailing. If the Poured Concrete or Poured Gypsum deck does not permit nailing, creosoted wood nailing strips shall be set in the concrete flush with its surface, these strips to be spaced three (3) feet apart and placed up and down and not across the slope of the roof.

APPLICATION OF ROOFING MATERIAL. First—Apply a uniform coating of Steep Roofing Pitch to the deck.

Second—Lay over the entire surface four full thicknesses of Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-four and one-half (24½) inches over preceding sheet. Each sheet shall be nailed with one inch barbed roofing nails through flat tin discs, eight inches from the upper edge, and nails shall be spaced not more than one foot apart. Where nailing strips are used, the felt shall be nailed with two nails through flat tin discs (at each nailing strip) placed six (6) inches and eight (8) inches respectively from the upper edge of each sheet.

Third—Each sheet shall be mopped the full distance of the twenty-four and one-half (24½) inch lap with Steep Roofing Pitch. The felt shall be firmly embedded into the hot moppings as applied. Care shall be taken that pitch moppings are even with lower edge of each overlying sheet and that the finished felt surface is free from pitch drippage.

Fourth—Over the entire surface, pour a uniform coating of Steep Roofing Pitch, into which, while hot, firmly embed not less than two hundred and seventy-five (275) pounds of slag for each one hundred (100) square feet of completed roofing. The slag shall be from one-fourth (¼) to five-eighths (⅝) inches in size, shall be dry and free from dirt. If roofing is applied during cool weather, or slag is damp, slag shall be heated and dried, so that it is warm when applied to the roof. The slag surfacing shall be firmly embedded in the surface coating. The finished surface shall be broomed clean of all loose slag.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet. For each one hundred (100) square feet of completed roofing surface there shall be used not less than one hundred (100) pounds of pitch for felt and deck moppings and not less than fifty (50) pounds nor more than sixty (60) pounds for embedding the slag. Pitch shall not be heated above three hundred and fifty (350°) degrees F. in cool or cold weather and not above three hundred and twenty-five (325°) degrees F. in hot weather.

Where steep roofing joins the flat roof, the roofing on the flat surface shall be carried up the inclined surface not less than twenty-four (24) inches before the steep roofing is applied.

Slag stops at gutters shall extend one and one-half (1½) inches above roof deck.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 20-year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the Owner.

FLASHING. For 20-Year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 203 and No. 202.

STEEP MINERAL SURFACED ROOFING OVER POURED CONCRETE OR POURED GYPSUM DECK

KOPPERS 10-YEAR BUILT UP ROOFING SPECIFICATION NO. 9

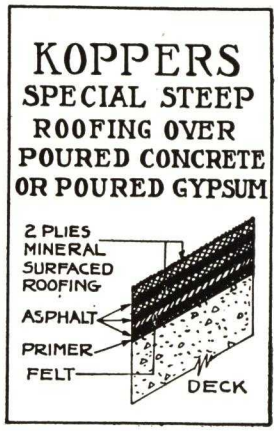
(For Inclines Exceeding Four (4) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, dry, firm and suitable for nailing. If the Poured Concrete or Poured Gypsum deck does not permit nailing, creosoted nailing strips shall be set flush with the deck, such strips to be spaced three (3) feet apart and placed up and down the slope of the roof.

APPLICATION OF ROOFING MATERIAL. First—Apply over the deck surface a priming coat of Asphalt Primer which shall be allowed to dry for at least six (6) hours.

Second—Coat the entire surface of the deck with a uniform mopping of Steep Asphalt into which, while hot, embed one (1) ply of Tarred Felt, lapping each sheet six (6) inches over the preceding sheet. The felt shall be laid across and not up and down the slope of the roof. The six (6) inch lap shall be thoroughly mopped with Steep Asphalt so that in no place shall felt touch felt. Nail each sheet two (2) inches from the lower edge with barbed roofing nails driven through flat tin discs and spaced not more than eighteen (18) inches on center.

When nailing strips are used the felt shall be nailed with three (3) nails through flat tin discs, eight (8) inches apart and starting two (2) inches from the lower edge of each sheet at each nailing strip.



Third—Spread with a mop over the surface thus prepared a uniform coating of Steep Asphalt, into which, while hot, embed a sheet of Mineral Surfaced Roofing, lapping each sheet the full nineteen (19) inch selvage. Sheets of Mineral Surfaced Roofing shall be laid across and not up and down the slope of the roof and shall be securely fastened in place along the selvage side with a double course of one (1) inch barbed roofing nails through flat tin discs, nails in each course to be spaced twelve (12) inches apart and courses staggered. Nailing occurring nearest the longitudinal center of each sheet shall be held back from the mineral surfacing two (2) inches. When nailing strips are used the sheets shall be nailed along the selvage side with three (3) nails driven through flat tin discs, spaced five (5) inches apart at each nailing strip. All nails to be held back two (2) inches from the mineral surfacing.

Fourth—Over the full width of the selvage mop a uniform coating of Steep Asphalt into which, while hot, embed the following sheet of Mineral Surfaced Roofing.

There shall be a six (6) inch end lap between adjoining sheets. The underlying sheet of each end lap shall be nailed with eight (8) one (1) inch barbed roofing nails through flat tin discs. Nails to be spaced four (4) inches apart starting two (2) inches from the lower edge of each sheet. Coat the underside of the six (6) inch end lap with Steep Asphalt and firmly embed the overlapping sheet.

(Continued on next page)

12

All edges and end laps shall be carefully rubbed down.

Mineral Surfaced Roofing shall be cut in strips not exceeding twenty (20) feet in length and shall be stacked flat for sufficient time to permit these strips to become perfectly flat before starting application.

GENERAL. All felts and mineral surfaced roofing shall be laid without wrinkles or buckles. All tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

For each one hundred (100) square feet of completed roofing surface there shall be used not less than one hundred (100) pounds of Steep Asphalt. Asphalt shall not be heated above 375 degrees Fahrenheit.

Where steep roof joins flat roof, the roofing in the flat surface shall be carried up the inclined surface not less than twenty-four (24) inches before steep roofing is applied. Special Steep Bonded Roofing is to be applied in connection with Bonded Flat Roofing.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. If bond is required, insert same paragraph as under "Bond" in Specification No. 4.

FLASHING. For 10-Year Flashing refer to Specification No. 101.

OVER PRECAST CONCRETE SLAB

4 PLY OVER PRECAST CONCRETE SLAB

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 10

(Maximum Incline One (1) Inch Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, firm, dry and clean. If roof deck is inclined, it shall be properly sloped to the outlets. All joints between concrete slabs shall be properly pointed.

APPLICATION OF ROOFING MATERIAL. First—Each slab shall be spot or strip mopped with Old Style Pitch. The pitch moppings shall be held back four (4) inches from edge of each joint.

Second—Lay over the entire surface four (4) full thicknesses of Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding sheet, mopping with Old Style Pitch the full twenty-four and one-half (24½) inches on each sheet. In no place shall felt touch felt. Tarred Felt shall be laid without wrinkles or buckles.

Third—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt, and from one-fourth (¼) inch to five-eighths (⅝) inch in size.

GENERAL. For each one hundred (100) square feet of completed roofing surface there shall be used not less than two hundred (200) pounds of Old Style Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.

Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. If Bond is required, insert same paragraph as under "Bond" in Specification No. 12.

FLASHING. For 20-Year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 203 and No. 202.

3 PLY OVER PRECAST CONCRETE SLAB

KOPPERS 15-YEAR BUILT UP ROOFING SPECIFICATION NO. 11

(Maximum Incline One (1) Inch Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, firm, dry and clean. If the roof deck is inclined it shall be properly sloped to the outlets. All joints between concrete slabs shall be properly pointed.

APPLICATION OF ROOFING MATERIAL. First—Each slab shall be spot or strip mopped with Old Style Pitch; the moppings shall be held back four (4) inches from the edge of each joint.

Second—Lay over the entire surface three (3) full thicknesses of Tarred Felt, lapping each sheet twenty-two (22) inches over the preceding sheet, mopping with Old Style Pitch the full twenty-two (22) inches so that in no place shall felt touch felt. All felts shall be laid without wrinkles or buckles.

Third—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt and from one-fourth (¼) inch to five-eighths (⅝) inch in size.

GENERAL. For each one hundred (100) square feet of completed roofing surface there shall be used not less than one hundred and seventy-five (175) pounds of Old Style Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather. Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a KOPPERS 15-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer, and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 15-Year Maintenance Bond to the owner.

FLASHING. For 15-Year Flashing refer to Specification No. 106.

INSULATION. Refer to Specifications No. 203 and No. 202.

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5 PLY OVER PRECAST GYPSUM AND GYPSUM STEEL PLANK

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 12

(Maximum Incline Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, dry, firm and clean. If the roof deck is inclined, it shall be properly sloped to the outlets. When precast gypsum slabs are used all joints shall be properly pointed.

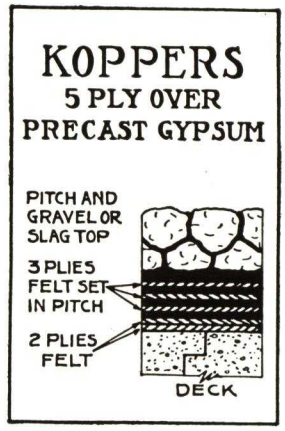
APPLICATION OF ROOFING MATERIAL. First—Two (2) full thicknesses of Tarred Felt shall be laid over the entire surface, lapping each sheet seventeen (17) inches over the preceding sheet. Nail as often as may be necessary to hold the sheets in place until the remaining felt is laid.

Second—Apply a uniform coating of Old Style Pitch.

Third—Lay over the entire surface three (3) full thicknesses of Tarred Felt, lapping each sheet twenty-two (22) inches over the preceding sheet, and mopping with Old Style Pitch the full width of the twenty-two (22) inch lap, so that in no place shall felt touch felt. Nail six (6) inches from the upper edge of each sheet and not more than two (2) feet apart. Nails shall not exceed seven-eighths (⅞) inch in length and shall be driven through flat tin discs which shall be not less than one (1) inch in diameter.

Fourth—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt and from one-fourth (¼) to five-eighths (⅝) inch in size.

GENERAL. All tarred felts shall be laid without wrinkles or buckles. Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet. For each one hundred (100) square feet of completed roofing surface there shall be used not less than one hundred and fifty (150) pounds of Old Style Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.



MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications

BOND. (If a KOPPERS 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer, and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the owner.

FLASHING. For 20-Year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 201 and No. 200.

4 PLY OVER PRECAST GYPSUM AND GYPSUM STEEL PLANK

KOPPERS 15-YEAR BUILT UP ROOFING SPECIFICATION NO. 13

(Maximum Incline Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, dry, firm and clean. If the roof deck is inclined it shall be properly sloped to the outlets. When precast gypsum slabs are used all joints shall be properly pointed.

APPLICATION OF ROOFING MATERIAL. First—Two (2) full thicknesses of Tarred Felt shall be laid over the entire surface, lapping each sheet seventeen (17) inches over the preceding sheet and nailing as often as may be necessary to hold the sheets until the remaining felt is laid.

Second — Apply a uniform coating of Old Style Pitch.

Third—Lay over the entire surface two (2) full thicknesses of Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet and mopping with Old Style Pitch the full width of the seventeen (17) inch lap so that in no place shall felt touch felt. Nail six (6) inches from the upper edge of sheet and not more than two (2) feet apart. Nails shall not exceed seven-eighths (⅞) inch in length and shall be driven through flat tin discs which shall not be less than one (1) inch in diameter.

Fourth—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt and from one-fourth (¼) inch to five-eighths (⅝) inch in size.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet. For each one hundred (100) square feet of completed roofing surface there shall be used not less than one hundred and twenty-five (125) pounds of Old Style Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., ——Co., or approved equal applied according to the above specifications.

BOND. (If a 15-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer, and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 15-Year Surety Maintenance Bond to the owner.

FLASHING. For 15-Year Flashing refer to Specification No. 106.

INSULATION. Refer to Specifications No. 201 and No. 200.

STEEP SLAG 5 PLY OVER PRECAST GYPSUM, GYPSUM STEEL PLANK OR PRECAST CONCRETE SLAB

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 14

(Maximum Incline Six (6) Inches Per Foot and Not Less Than Two (2) Inches Per Foot)

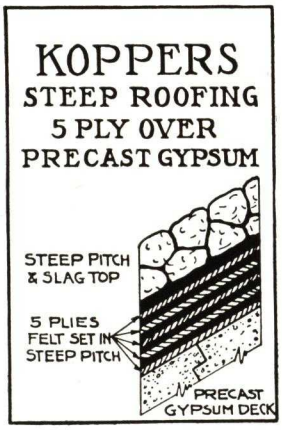
PREPARATION OF SURFACE TO BE ROOFED. For concrete slabs creosoted nailing strips set parallel with incline of roof and spaced three (3) feet apart must be installed in each slab, or nailable concrete shall be provided. The roof deck shall be smooth, dry, firm and clean. When precast gypsum slabs are used all joints shall be properly pointed.

APPLICATION OF ROOFING MATERIAL. First—Lay over the entire surface five (5) full thicknesses of Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-six (26) inches over preceding sheet. Each sheet shall be nailed with one and one-half (1½) inch barbed roofing nails, through flat tin discs, eight (8) inches from the upper edge. Nails to be spaced not more than one (1) foot apart.

Second—Each sheet shall be mopped for a distance of twenty-four (24) inches with Steep Roofing Pitch. The felt shall be firmly embedded into the hot moppings as applied. Care shall be taken that pitch moppings are even with lower edge of each overlying sheet, and that the finished felt surface shall be free of drippage.

Third—Over the entire surface, pour a uniform coating of Steep Roofing Pitch, into which, while hot, firmly embed not less than two hundred and seventy-five (275) pounds of slag for each one hundred (100) square feet of completed roofing. The slag shall be from one-fourth (¼) to five-eighths (⅝) inch in size, shall be dry and free from dirt. If roofing is applied during cool weather or slag is damp, slag shall be heated and dried, so that it is warm when applied to the roof. The slag surfacing shall be firmly embedded into the surface coating. The finished surface shall be broomed clean of all loose slag.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet. For each one hundred (100) square feet of completed roofing surface there shall be used not less than eighty (80) pounds of pitch for felt moppings and not less than fifty (50) pounds nor more than sixty (60) pounds for embedding the slag. Pitch shall not be heated above three hundred and fifty (350°) degrees F. in cool or cold weather and not above three hundred and twenty-five (325°) degrees F. in hot weather.



Where steep roofing joins the flat roof, the roofing on the flat surface shall be carried up the inclined surface not less than twenty-four (24) inches before the steep roofing is applied.

Slag stops at gutters shall extend one and one-half (1½) inches above the roof deck.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the owner.

FLASHING. For 20-year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 201 and No. 200.

STEEP SLAG 4 PLY OVER PRECAST GYPSUM, GYPSUM STEEL PLANK OR PRECAST CONCRETE SLAB

KOPPERS 15-YEAR BUILT UP ROOFING SPECIFICATION NO. 26

(Maximum Incline Six (6) Inches Per Foot and Not Less Than Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. Refer to Specification No. 14.

APPLICATION OF ROOFING MATERIAL. First—Lay over the entire surface four (4) full thicknesses of Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-four and one-half (24½) inches over preceding sheet. Each sheet shall be nailed with one (1) inch barbed roofing nails through flat tin discs, each eight (8) inches from the upper edge. Nails shall be spaced not more than one (1) foot apart.

Second—Each sheet shall be mopped for a distance of twenty-two and one-half (22½) inches with Steep Roofing Pitch. The felt shall be firmly embedded into the hot moppings as applied. Care shall be taken that the pitch moppings are even with lower edge of each overlying sheet, and that the finished felt surface is free of pitch drippage.

Third—Over the entire surface, pour a uniform coating of Steep Roofing Pitch into which, while hot, firmly embed not less than two hundred and seventy-five (275) pounds of slag for each one hundred (100) square feet of completed roofing. The slag shall be from one-fourth (¼) inch to five-eighths (⅝) inch in size, shall be dry and free from dirt. If roofing is applied during cool weather, or slag is damp, slag shall be heated and dried, so that it is warm when applied to the roof. The slag surfacing shall be firmly embedded into the surface coating, the finished surface shall be broomed clean of all loose slag.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

For each one hundred (100) square feet of completed roofing surface there shall be not less than sixty (60) pounds of pitch for felt moppings and not less than fifty (50) pounds nor more than sixty (60) pounds for embedding the slag. Pitch shall not be heated above three hundred and fifty (350°) degrees F. in cool or cold weather and not above three hundred and twenty-five (325°) degrees F. in hot weather.

Where steep roofing joins the flat roof, the roofing on the flat surface shall be carried up the inclined surface not less than twenty-four (24) inches before the steep roofing is applied. Slag stops at gutters shall extend one and one-half (1½) inches above the roof deck.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to above specifications.

BOND. (If a 15-year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 15-Year Surety Maintenance Bond to the owner.

FLASHING. For 15-year Flashing refer to Specification No. 106.

INSULATION. Refer to Specifications No. 200 and No. 201.

4 PLY OVER STEEL DECK WITH INSULATION

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 17

(Maximum Incline One (1) Inch Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The Steel Deck shall be clean, smooth and dry, and shall be properly anchored to the steel purlins, and all joints properly lapped. The deck shall be primed with Asphalt Primer before application of the insulation, unless previously shop-coated. If the deck is inclined it shall be properly graded to the outlets.

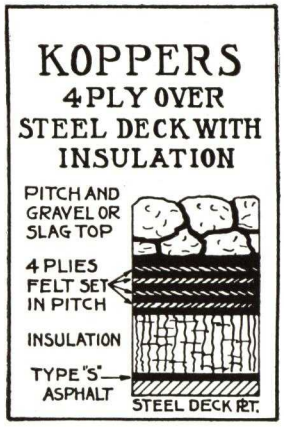
APPLICATION OF MATERIAL. First—Mop the steel deck with Steep Asphalt into which, while hot, embed the insulation pressing firmly into the asphalt. The insulation must be thoroughly dry and of approved type and must be able to retain nails. When more than one (1) layer of insulation is used the top surface of each layer shall be coated with Old Style Pitch into which, while hot, embed the succeeding layer. (This is optional because layers may be laid dry if desired.) All joints shall be broken between the layers of insulation. All layers of insulation shall be parallel to preceding layers. Edges shall be brought closely together and shall not be forced into place. No more insulation shall be installed at any one time than can be protected by pitch and felt in case of sudden weather changes. Cut-offs consisting of two (2) plies of Tarred Felt and moppings of Steep Asphalt extending on to the deck at least six (6) inches and four (4) inches on top of the insulation shall be applied at the end of each day's work over exposed edges of insulation.

All edges of insulation adjoining parapet walls, cants, eaves, vertical surfaces, etc., shall be sealed by applying two (2) plies of Tarred Felt and moppings of Asphalt.

Second—Apply a uniform coating of Old Style Pitch over the insulation.

Third—Lay over the entire surface four (4) full thicknesses of Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over the preceeding sheet, mopping with Old Style Pitch the full twenty-four and one-half (24½) inches on each sheet so that in no place shall felt touch felt. All tarred felts shall be laid without wrinkles or buckles.

Fourth—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel, or three hundred (300) pounds of slag, for each one hundred (100) square feet. The gravel or slag shall be dry and free from dirt, and from one-fourth (¼) inch to five-eighths (⅝) inch in size.



GENERAL. For each one hundred (100) square feet of completed roofing there shall be used not less than two hundred (200) pounds of Old Style Pitch and not less than thirty-five (35) pounds of Old Style Pitch for moppings between each layer of insulation. Approximately thirty-five (35) pounds of Steep Asphalt shall be required for the deck mopping. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather. Asphalt shall not be heated above three hundred and seventy-five (375°) degrees Fahrenheit.

Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

Koppers Company will not be responsible for any damage to or below the built-up roofing caused by or as the result of the use of insulation.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the owner.

FLASHING. For 20-Year Flashing refer to Specification No. 107.

INSULATION. Refer to Specification No. 204.

3 PLY OVER STEEL DECK WITH INSULATION

KOPPERS 15-YEAR BUILT UP ROOFING SPECIFICATION NO. 18

(Maximum Incline One (1) Inch Per Foot)

Same as specification No. 17 except for the following changes:

Paragraph headed THIRD should read: Lay over the entire surface three (3) full thicknesses of Tarred Felt, lapping each sheet twenty-two (22) inches over the preceding sheet, mopping with Old Style Pitch the full twenty-two (22) inches on each sheet so that in no place shall felt touch felt. All tarred felts shall be laid without wrinkles or buckles.

Paragraph headed GENERAL should read: For each one hundred (100) square feet of completed roofing there shall be used not less than one hundred and seventy-five (175) pounds of Old Style Pitch and not less than thirty-five (35) pounds of Old Style Pitch for moppings between each layer of insulation. Approximately thirty-five (35) pounds of Steep Asphalt will be required for deck mopping. Asphalt shall not be heated above three hundred and seventy-five (375°) degrees Fahrenheit. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.

Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

Koppers Company will not be responsible for any damage to or below the built-up roofing caused by or as the result of the use of insulation.

(Continued on next page)

BOND. (If a 15-Year Guarantee Maintenance Bond is required) The roofing must be appplied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer, and subject to their inspection and approval and upon completion of work furnish the roofing manufacturer's 15-Year Surety Maintenance Bond to the owner.

FLASHING.—For 15-Year Flashing refer to Specification No. 106.

INSULATION. Refer to Specification No. 204.

STEEP 4 PLY SLAG OVER STEEL DECK WITH INSULATION

KOPPERS 20-YEAR ROOFING SPECIFICATION NO. 19

(Maximum Incline Six (6) Inches Per Foot and Not Less Than One (1) Inch Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The steel deck shall be clean, smooth and dry, and shall be properly anchored to the steel purlins, and all joints properly lapped. The deck shall be primed with Asphalt Primer before application of the insulation, unless previously shop-coated. The deck shall be properly graded to the outlets.

APPLICATION OF INSULATION. First—Mop the steel deck with Steep Asphalt into which, while hot, embed the insulation pressing firmly into the asphalt. The insulation must be thoroughly dry and of approved type and must be able to retain nails. Insulation shall be securely fastened to the deck by means of approved screws, expanding nails or cleats which shall be placed at each corner and in the center of each sheet of insulation. When more than one (1) layer of insulation is applied fasteners shall be driven after the top layer has been applied. The top surface of each layer of insulation shall be coated with Steep Pitch into which embed the succeeding layer. (This is optional because insulation sheets may be laid dry if desired.) All joints shall be broken between layers of insulation. All layers of insulation shall be parallel to succeeding layers. Edges shall be brought closely together and shall not be forced into place.

No more insulation shall be installed at any one time than can be protected by pitch and felt in case of sudden weather changes.

Cutoffs consisting of two (2) plies of Tarred Felt and moppings of Steep Asphalt extending on to the deck at least six (6) inches and four (4) inches on top of the insulation shall be applied at the end of each day's work over exposed edges of insulation.

All edges of insulation adjoining parapet walls, cants, eaves, vertical surfaces, etc., shall be sealed by applying two (2) plies of Tarred Felt and moppings of Asphalt.

APPLICATION OF ROOFING MATERIALS. First — Apply a uniform coating of Steep Roofing Pitch to the insulation.

Second—Lay over the entire surface four (4) full thicknesses of Tarred Felt at right angles to the incline of the roof, lapping each sheet twenty-four and one-half (24½) inches over the preceding sheet. Nail each sheet with soft nose nails of sufficient length to completely penetrate the insulation but which will not puncture the steel deck. Nails to be through flat tin discs eight (8) inches from the upper edge and to be spaced not more than one (1) foot apart.

Third—Each sheet shall be mopped the full distance of the twenty-four and one-half (24½) inch lap with steep roofing pitch. The felt shall be firmly embedded into the hot moppings as applied. Care shall be taken that the pitch moppings are even with the lower edge of each overlying sheet and that the finished felt surface is free from pitch drippage.

Fourth—Over the entire surface pour a uniform coating of Steep Roofing Pitch into which, while hot, firmly embed not less than two hundred and seventy-five (275) pounds of slag for each one hundred (100) square feet of completed roofing. The slag shall be from one-fourth (¼) to five-eighths (⅝) inch in size and shall be dry and free from dirt. If roofing is applied during cool weather or slag is damp, slag shall be heated and dried so that it is warm when applied to the roof. The slag surfacing shall be firmly embedded into the surface coating. The finished surface shall be broomed clean of all loose slag.

GENERAL. All tarred felt shall be laid without wrinkles or buckles. Tarred felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

There shall be applied not less than thirty-five (35) pounds of Steep Asphalt for deck moppings and not less than thirty-five (35) pounds of Steep Roofing Pitch for moppings between each layer of insulation. For each one hundred (100) square feet of completed roofing surface above insulation there shall be used not less than one hundred (100) pounds of steep roofing pitch for felt and insulation moppings, and not less than fifty (50) pounds nor more than sixty (60) pounds for embedding the slag. Pitch shall not be heated above three hundred and fifty (350°) degrees F. in cool or cold weather and not above three hundred and twenty-five (325°) degrees F. in hot weather.

Where steep roofing joins the flat roof, the roofing on the flat surface shall be carried up the inclined surface not more than twenty-four (24) inches before the steep roofing is applied.

Slag stops at gutters shall extend one and one-half (1½) inches above roof deck.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the Owner.

FLASHING. For 20-Year Flashing refer to Specification No. 107.

INSULATION. Refer to Specification No. 204.

6/8

5 PLY OVER POURED CONCRETE UNDER PROMENADE TILE

KOPPERS PROMENADE TILE BUILT UP ROOFING SPECIFICATION NO. 20

(Maximum Incline One (1) Inch Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The deck shall be concrete and shall be smooth, dry, firm, clean and properly sloped to the outlets.

APPLICATION OF ROOFING MATERIAL. First—Apply a uniform coating of Old Style Pitch.

Second—Lay over the entire surface two (2) full thicknesses of Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet, mopping with Old Style Pitch the full seventeen (17) inches on each sheet so that in no place shall felt touch felt.

Third—Apply a uniform coating of Old Style Pitch.

Fourth—Lay over the entire surface two (2) full thicknesses of Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet, mopping with Old Style Pitch the full seventeen (17) inches on each sheet so that in no place shall felt touch felt.

Fifth—Before laying the tile, the surface of the roofing shall be thoroughly cleaned and the roofing mopped with Steep Roof Pitch into which, while hot, embed one (1) layer of Tarred Felt lapping each sheet two (2) inches over the preceding sheet. Over this surfacing and immediately preceding the laying of the tile spread a heavy uniform coating of Steep Roofing Pitch. Only part of the roof surface shall be covered with the last ply of felt and mopping of pitch at a time, the tile then being laid over that portion at once.

Sixth—The vitrified clay tile shall be set in not less than three-fourths (¾) inch of Portland Cement Mortar (1 to 3 mix). The joints shall be grouted full with Portland Cement Mortar (1 to 2 mix). The tile shall be laid to show three-sixteenths (3/16) inch to one-fourth (¼) inch joints. Expansion joints three-fourths (¾) inch wide filled with plastic mixture, which must be approved by the architect, shall be provided between the tile and all flashings. Either metal or mastic expansion joints shall be provided throughout the roof surface as may be necessary. Expansion joints shall extend through to the roofing and shall be spaced not more than twenty (20) feet apart in any direction. They shall also be installed at all walls, skylights, curbs, etc.

GENERAL. All tarred felts shall be laid without wrinkles or buckles. Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet. For each one hundred (100) square feet of completed roofing surface there should be used not less than one hundred and twenty-five (125) pounds of Old Style Pitch and seventy-five (75) pounds of Steep Pitch. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.

All end laps between sections of tarred felt shall be staggered at least six (6) inches.

Notice—The Koppers Company will not be responsible or liable for leaks due to the installation, contraction or expansion of Promenade Tile and will not be responsible for the taking up and replacing of tile in order to locate leaks through the roofing.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

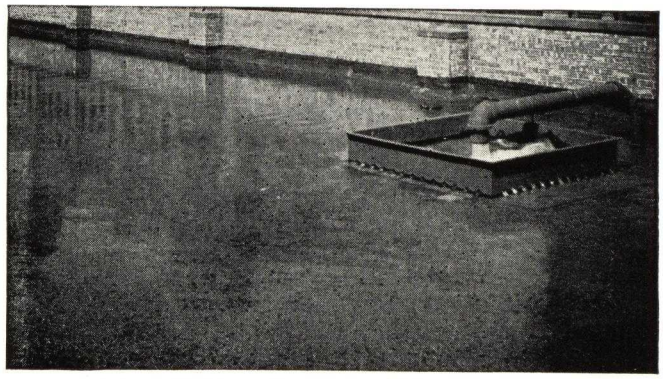
BOND. (If a 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the owner.

FLASHING. For 20-Year Flashing refer to Specification No. 107

INSULATION. Refer to Specifications No. 203 and No. 202.

KOPPERS SPRAY POND AND WATER-COOLED ROOFING SPECIFICATIONS

One-half to two inches of water on flat roofs will decrease the maximum peaks of heat within the top stories of most buildings at least 10° F. Spray equipment is not required. The water flows out onto the roofing from a single steel box as shown in the photograph. Pipe nipples of the proper height to maintain one-half to two inches of water on the roof are set inside the roof drains. The excess water flows over the screened tops of the pipe nipples and down the drains. In air-conditioned buildings cooling the roof by water cuts down the cost of refrigerating the air and the water may be recycled to the system.



Water flowing onto a Koppers Water-Cooled Roof

SPRAY POND OR WATER-COOLED ROOF OVER WOOD DECK, PRECAST GYPSUM SLAB OR GYPSUM STEEL PLANK

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 21

(Preferably Dead Level. Maximum Incline Two (2) Inches Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be clean, smooth and free from knot holes, large cracks and loose boards. The lumber shall be seasoned or treated. If the roof deck is inclined it shall be properly sloped to the outlets.

APPLICATION OF ROOFING MATERIAL. First—Lay one (1) thickness of sheathing paper, weighing not less than five (5) pounds per one hundred (100) square feet, lapping each sheet one (1) inch over the preceding sheet. If Precast Gypsum Slab is used, sheathing paper may be omitted.

Second—Lay over the entire surface two (2) full thicknesses of Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet. Nail as often as necessary to hold the sheets in place and until the remaining felt is laid.

Third—Apply over the entire surface a uniform coating of Old Style Pitch.

Fourth—Lay over the entire surface three (3) full thicknesses of Tarred Felt, lapping each sheet twenty-two (22) inches, and mop with Old Style Pitch the full width of the 22-inch lap, so that in no place shall felt touch felt. Each sheet shall be nailed not less than two (2) inches from the upper edge, nails to be spaced not more than two (2) feet apart.

Fifth—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed approximately four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-fourth (¼) inch to five-eighths (⅝) inch in size, and shall be dry and free from dirt.

Sixth—All loose slag and gravel shall be swept from the surface and a second uniform pouring of Old Style Pitch shall be poured over the slag or gravel into which, while hot, there shall be applied a second layer of three hundred (300) pounds of gravel or two hundred (200) pounds of slag. The entire surface shall then be thoroughly broomed free from all loose gravel or slag. It is advisable to roll, with a light roller, the finished surface.

GENERAL. All Tarred Felt shall be laid without wrinkles or buckles. Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

All felts shall be turned up not less than four (4) inches at vertical surfaces.

There shall be used not less than two hundred and seventy-five (275) pounds of Old Style Pitch for each one hundred (100) square feet of completed roofing surface. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.

At points where water pressure from the spray is excessive, the roof surface shall be protected with creosoted board platforms or other suitable construction to break the force of the water. These platforms shall be laid on top of the roof surface and not fastened to the deck.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the owner.

FLASHING. On all water-cooled roofs, cant strips are required. For 20-Year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 200 and No. 201.

SPRAY POND OR WATER-COOLED ROOF OVER POURED CONCRETE, POURED GYPSUM OR PRECAST CONCRETE SLAB

KOPPERS 20-YEAR BUILT UP ROOFING SPECIFICATION NO. 23

(Preferably Dead Level. Maximum Incline One (1) Inch Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, dry, firm and clean.

APPLICATION OF ROOFING MATERIAL. First—Apply a uniform coating of Old Style Pitch to the deck. If precast concrete slab is used, the surface shall be spot or strip mopped and joints between slabs properly grouted.

Second—Lay over the entire surface four (4) full thicknesses of Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over the preceding sheet, mopping with Old Style Pitch the full twenty-four and one-half (24½) inches on each sheet so that in no place shall felt touch felt. All felts shall be turned up not less than four (4) inches at vertical surfaces.

Third—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed approximately four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-fourth (¼) inch to five-eighths (⅝) inch in size, and shall be dry and free from dirt.

(Continued on next page)

6/8

Fourth—All loose slag and gravel shall be swept from the surface and a second uniform pouring of Old Style Pitch shall be poured over the slag or gravel, into which, while hot, there shall be applied a second layer of three hundred (300) pounds of gravel or two hundred (200) pounds of slag. The entire surface shall then be thoroughly broomed free from all loose gravel or slag. It is advisable to roll, with a light roller, the finished surface.

GENERAL. All Tarred Felt shall be laid without wrinkles or buckles. Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

There shall be used not less than three hundred (300) pounds of Old Style Pitch for each one hundred (100) square feet of completed roofing surface. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.

At points where water pressure from the spray is excessive, the roof surface shall be protected with creosoted board platforms or other suitable construction to break the force of the water. These platforms shall be laid on top of the roof surface and not fastened to the deck.

MATERIALS. Materials shall be those as manufactured by Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 20-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 20-Year Surety Maintenance Bond to the owner.

FLASHING. On all water-cooled roofs, cant strips are required. For 20-Year Flashing refer to Specification No. 107.

INSULATION. Refer to Specifications No. 203 and No. 202.

SPRAY POND OR WATER-COOLED ROOF OVER POURED CONCRETE, POURED GYPSUM, PRECAST CONCRETE SLAB

KOPPERS 15-YEAR BUILT UP ROOFING SPECIFICATION NO. 24

(Maximum Incline One (1) Inch Per Foot)

PREPARATION OF SURFACE TO BE ROOFED. The roof deck shall be smooth, dry, firm and clean.

APPLICATION OF ROOFING MATERIAL. First — Apply a uniform coating of Old Style Pitch to the deck. If Precast Concrete Slab is used, the surface shall be spot or strip mopped; and if Book Tile is used, deck shall be covered with not less than a one (1) inch thickness of Gypsum or Portland Cement Mortar before application of Old Style Pitch.

Second—Lay over the entire surface three (3) full thicknesses of Tarred Felt lapping each sheet twenty-two (22) inches over the preceding sheet, and mopping with Old Style Pitch the full twenty-two (22) inches on each sheet so that in no place shall felt touch felt. The felt shall extend up all vertical surfaces not less than four (4) inches.

Third—Pour over the entire surface a uniform coating of Old Style Pitch into which, while hot, embed approximately four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-fourth (¼) inch to five-eighths (⅝) inch in size, and shall be dry and free from dirt.

Fourth—All loose slag and gravel shall be swept from the surface and a second uniform pouring of Old Style Pitch shall be poured over the slag or gravel, into which, while hot, there shall be applied a second layer of three hundred (300) pounds of gravel or two hundred (200) pounds of slag. The entire surface shall then be thoroughly broomed free from all loose gravel or slag. It is advisable to roll, with a light roller, the finished surface.

GENERAL. All Tarred Felt shall be laid without wrinkles or buckles. Tarred Felt shall weigh not less than fifteen (15) pounds per one hundred (100) square feet.

There shall be used not less than two hundred and seventy-five (275) pounds of Old Style Pitch for each one hundred (100) square feet of completed roofing surface. Pitch shall not be heated above three hundred and seventy-five (375°) degrees F. in cool or cold weather and not above three hundred and fifty (350°) degrees F. in hot weather.

At points where water pressure from the spray is excessive, the roof surface shall be protected with creosoted board platforms or other suitable construction to break the force of the water. These platforms shall be laid on top of the roof surface and not fastened to the deck.

MATERIALS. Materials shall be those as manufactured by the Koppers Company, —— Co., —— Co., —— Co., or approved equal applied according to the above specifications.

BOND. (If a 15-Year Guarantee Maintenance Bond is required.) The roofing shall be applied by a roofing contractor approved by the roofing manufacturer, who shall apply the roofing in strict accordance with the specifications and requirements of the manufacturer and subject to their inspection and approval, and upon completion of work furnish the roofing manufacturer's 15-Year Surety Maintenance Bond to the owner.

FLASHING. On all water-cooled roofs, cant strips are required. For 15-Year Flashing refer to Specification No. 106.

INSULATION. Refer to Specifications No. 203 and No. 202.

(Continued on next page)

INSULATION SPECIFICATIONS

The following methods of installing insulation are those recommended by Koppers Company.

GENERAL. The roofing insulation must be kept dry both before and after application.

The following specifications for the installation of insulation are recommended so as to provide and insure the owner the maximum effect and life of the insulation.

KOPPERS COMPANY GUARANTEE BOND COVERING BUILT UP ROOFING AND FLASHING DOES NOT COVER ROOF INSULATION NOR WILL KOPPERS COMPANY BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY OR THE RESULT OF THE USE OF INSULATION.

WOOD NAILING STRIPS. The general contractor shall provide wood nailing strips which shall form a nailing base under all metal flashing aprons and flanges. Strips shall be the full thickness of the insulation and shall extend not less than one (1) inch beyond the apron or flange and shall be securely fastened to the roof deck.

CANT STRIPS. Cant Strips on wood decks shall be set on top of the insulation and secured by nailing through the insulation to the deck. On incombustible decks where the cant is formed with Gypsum or concrete, a square shoulder the full thickness of the insulation at the bottom of the cant shall be formed.

NAILS. Nails shall be galvanized roofing nails driven through flat tin discs, or Simplex flat head roofing nails.

Nails for use with insulation shall be of sufficient length to pass through the insulation and penetrate into, but not through, the deck construction, with the exception that on steel decks where nailing is necessary, the nails shall be soft-nosed roofing nails which shall not penetrate the steel deck.

CUT-OFFS. Cut-offs consisting of two (2) plies of tarred felt and moppings of Old Style Pitch or Asphalt extending onto the deck at least six (6) inches and four (4) inches on top of the insulation, shall be applied at the end of each day's work over exposed edges of insulation. WHEN CORK INSULATION IS USED, CUT-OFFS SHOULD BE REMOVED WHEN WORK IS RESUMED, OR SHOULD ALL RUN IN ONE DIRECTION.

All edges of insulation adjoining parapet walls, cants, eaves, vertical surfaces, etc., shall be sealed by applying two (2) plies of Tarred Felt and moppings of Pitch or Asphalt.

GENERAL APPLICATION OF INSULATION. Insulation must be thoroughly dry and of approved type, and must be able to retain nails.

No more insulation shall be laid at any one time than can be protected by pitch and felt in case of sudden weather changes.

Edges of insulation shall be brought closely together and shall not be forced into place. Where insulation joins vertical surfaces, the insulation shall be cut in a neat manner allowing at least one-half (½) inch clearance.

When more than one (1) layer of insulation is used, joints between layers shall be broken. All layers shall be parallel to preceding layers.

OVER WOOD, PRECAST GYPSUM AND GYPSUM STEEL DECKS FOR LOW HUMIDITY CONDITIONS

KOPPERS INSULATION SPECIFICATION NO. 200

APPLICATION OF MEMBRANE BELOW INSULATION. The roof deck shall be covered with one (1) layer of red rosin sheathing paper weighing not less than five (5) pounds per one hundred (100) square feet. Sheathing paper shall be lapped two (2) inches and secured to the deck by occasional nailing. Over Precast Gypsum and Gypsum Steel Decks, sheathing paper may be omitted.

Sheathing paper may be omitted when insulation is laid in two (2) layers providing there are no pitch moppings between the layers.

On decks having inclines up to two (2) inches per foot, each sheet of insulation shall be secured to the deck by nails at each of the four corners and on inclines exceeding two (2) inches per foot, nails are to be spaced one (1) foot apart, and stagger nailed through the longitudinal center of each sheet. All nails shall penetrate the deck at least three-fourths (¾) inch. Nailing of two layers of insulation shall be through the second or top layer only—do not nail through the lower layer.

APPLICATION OF ROOFING ABOVE INSULATION. The roofing shall be applied according to Koppers Specifications No. 1, No. 2, No. 3, and No. 25 on wood decks, and according to Specifications No. 12, No. 13, No. 14, and No. 26 on Precast Gypsum or Gypsum Steel Plank Decks, with the exception that the red rosin paper may be omitted. When roofs have an incline of from two (2) inches to six (6) inches per foot, use Steep Roofing Pitch.

OVER WOOD, PRECAST GYPSUM AND GYPSUM STEEL DECKS FOR HIGH HUMIDITY CONDITIONS

KOPPERS INSULATION SPECIFICATION NO. 201

APPLICATION OF MEMBRANE BELOW INSULATION. First—The roof deck shall be covered with one (1) layer of red rosin sheathing paper weighing not less than five (5) pounds per one hundred (100) square feet. The sheathing paper shall be lapped two (2) inches and secured to the deck by occasional nailing. On precast gypsum, sheathing may be omitted.

Second—Two full thicknesses of Tarred Felt shall be laid over the entire surface, lapping each sheet seventeen (17) inches over the preceding sheet and nailing as often as may be necessary to hold the sheets in place.

Extend all felts up vertical surfaces not less than eight (8) inches. After the insulation has been laid, turn these eight (8) inch extensions down over the exposed surface of the insulation and thoroughly mop with Old Style Pitch when installing flat roofs, and steep pitch when installing steep roofs.

Third—Mop the entire surface with a uniform coating of Old Style Pitch into which, while hot, firmly embed the insulation. When roofs have an incline of from two (2) inches to six (6) inches per foot, use Steep Roofing Pitch.

Fourth—On decks having inclines up to two (2) inches per foot, each sheet of insulation shall be secured to the deck by nails at each of the four corners and on inclines exceeding two (2) inches per foot, nails are to be spaced one (1) foot apart and stagger nailed through the longitudinal center of each sheet. All nails shall penetrate the deck at least three-fourths (¾) inch. Nailing of two layers of insulation shall be through the second or top layer only—do not nail through the lower layer.

When insulation is laid in two layers, mop the entire surface of the first layer with Old Style Pitch on flat roofs and Steep Pitch on steep roofs into which, while hot, embed the second layer of insulation. (This is optional.)

APPLICATION OF ROOFING ABOVE INSULATION. Roofing shall be applied according to Koppers Specifications No. 5, No. 6, No. 7, and No. 8.

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OVER POURED CONCRETE, GYPSUM AND PRECAST CONCRETE SLAB FOR LOW HUMIDITY CONDITIONS

KOPPERS INSULATION SPECIFICATION NO. 202

FOR FLAT ROOFS. First—Apply a uniform coating of Old Style Pitch to the deck.

If precast concrete slab or tile deck, strip or spot mop with Old Style Pitch up to four (4) inches from the edge of each joint. While the pitch is hot immediately embed the insulation.

Second—If there are two (2) layers of insulation, mop the entire first layer with Old Style Pitch into which, while hot, embed the second layer of insulation.

FOR STEEP ROOFING HAVING AN INCLINE OF TWO (2) TO SIX (6) INCHES PER FOOT. First—Apply a uniform coating of Steep Roofing Pitch to the deck into which, while hot, embed the insulation.

On precast tile or slab deck, spot or strip mop with steep roofing pitch up to four (4) inches from the edge of each joint.

Second—If there are two (2) layers of insulation, the entire first layer shall be coated with Steep Roofing Pitch into which, while hot, embed the second layer of insulation. Each sheet of insulation shall be secured in place by nailing. If two (2) layers of insulation are used nailing shall be through the top layer only. Nails shall be spaced one (1) foot apart and shall penetrate the deck at least three-quarters (¾) of an inch and shall be spaced along the edge and stagger nailed through the longitudinal center of each sheet of insulation.

When the deck will not permit nailing, which necessitates in nailing strips, insulation shall be secured to each nailing strip with nails spaced approximately one (1) foot apart.

APPLICATION OF ROOFING ABOVE INSULATION. The roofing shall be applied according to Koppers Company's Specifications Nos. 5, 6, 7, 8, 20, 23 and 24.

OVER POURED CONCRETE, GYPSUM AND PRECAST CONCRETE SLAB FOR HIGH HUMIDITY CONDITIONS

KOPPERS INSULATION SPECIFICATION NO. 203

APPLICATION OF MEMBRANE BELOW INSULATION FOR FLAT ROOFS. First—Apply a uniform coating of Old Style Pitch to the deck. On precast concrete slab or tile deck, spot or strip mop with Old Style Pitch up to four (4) inches from the edge of each joint.

Second—Lay over the entire surface two (2) full thicknesses of fifteen (15) pound tarred felt, lapping each sheet seventeen (17) inches over the preceding sheet—mopping with Old Style Pitch the full seventeen (17) inches so that in no place shall felt touch felt.

FOR STEEP ROOFS HAVING AN INCLINE FROM TWO (2) TO SIX (6) INCHES PER FOOT. First—Apply a uniform coating of Steep Roofing Pitch to the Deck. On precast concrete or tile, spot or strip mop with Steep Pitch up to four (4) inches from the edge of each joint.

Second—Lay over the entire surface two (2) full thicknesses of fifteen (15) pound Tarred Felt at right angles to the incline of the roof lapping each sheet seventeen (17) inches over the preceding sheet.

Each sheet shall be nailed with one (1) inch barbed roofing nails through flat tin discs eight (8) inches from the upper edge and nails shall be spaced not more than one (1) foot apart. Where nailing strips are used the felt shall be nailed with two (2) nails through flat tin discs at each nailing strip placed six (6) inches and eight (8) inches respectively from the upper edge of each sheet.

Third—(For both Flat and Steep) Extend all plies of felt up vertical surfaces not less than eight (8) inches and after insulation has been installed turn this eight (8) inch extension down over the exposed edge of insulation and thoroughly mop with coal tar pitch. (Steep Pitch for Steep Roofing.)

APPLICATION OF INSULATION FOR FLAT ROOFS. First—Apply a uniform coating of Old Style Pitch over the entire surface into which, while hot, embed the insulation. If there are two (2) layers of insulation mop the entire surface of the first layer with Old Style Pitch into which, while hot, embed the second layer of insulation.

FOR STEEP ROOFS HAVING A SLOPE OF FROM TWO (2) TO SIX (6) INCHES PER FOOT. First—Apply a uniform coating of Steep Roofing Pitch over the entire surface into which, while hot, embed the insulation. Each sheet of insulation shall be secured in place by nailing. Nails shall be spaced approximately one (1) foot apart and shall penetrate the deck at least three-fourths (¾) of an inch and shall be placed along edge and stagger nailed through the longitudinal center of each sheet of insulation.

When the deck will not permit nailing, which necessitates in providing nailing strips, insulation shall be secured to each nailing strip with nails spaced approximately one (1) foot apart. Nailing of two layers of insulation shall be through the top layer only. Do not nail the first layer.

APPLICATION OF ROOFING ABOVE INSULATION. The roofing shall be applied according to Koppers Company's Specifications Nos. 5, 6, 7, 8, 20, 23 and 24.

OVER STEEL DECKS FOR HIGH HUMIDITY CONDITIONS

KOPPERS INSULATION SPECIFICATION NO. 204

Koppers Company Will Not Bond Roofing Over Steel Decks Unless the Steel Deck Is Insulated

APPLICATION OF MEMBRANE BELOW INSULATION. First—Mop the steel deck with Steep Asphalt.

Second—Lay over the entire surface two (2) full thicknesses of fifteen (15) pound Asphalt Felt, lapping each sheet seventeen (17) inches over the preceding sheet.

Extend all felts up on vertical surfaces not less than eight (8) inches. After the insulation has been laid turn these eight (8) inch extensions down over the exposed surface of the insulation and thoroughly mop with Old Style Pitch when installing flat roofs and Steep Pitch when installing Steep Roofs.

APPLICATION OF INSULATION. First—Apply a uniform coating of Steep Asphalt into which, while hot, embed the insulation.

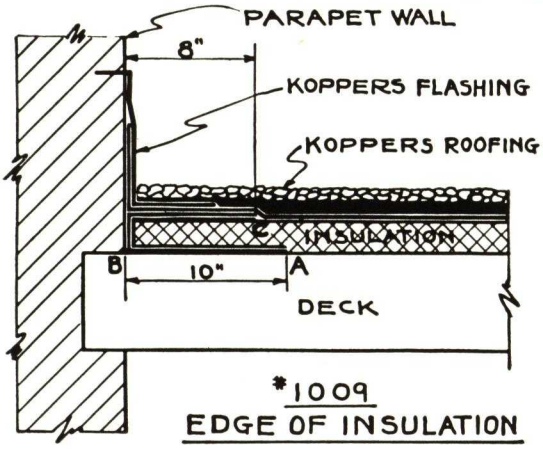
When more than one (1) layer of insulation is applied, the top surface of each layer shall be coated with Steep Asphalt into which, while hot, embed the succeeding layer.

When the incline of the roof exceeds one (1) inch per foot, the insulation shall be secured to the deck through the top layer with the proper devices provided by the deck manufacturer.

APPLICATION OF ROOFING ABOVE INSULATION. The roofing shall be installed according to Koppers Company's Specifications Nos. 17, 18 or 19 above insulation.

METHOD OF WATERPROOFING INSULATION

WITHOUT WATERPROOFING UNDER INSULATION



*1009
EDGE OF INSULATION

WHEN INSULATION IS APPLIED WITHOUT WATERPROOFING ON UNDERSIDE, EDGES OF INSULATION SHALL BE PROTECTED BY THE APPLICATION OF 2 PLIES OF TARRED FELT. THIS FELT TO EXTEND UNDER INSULATION AT LEAST 10" AND OVER INSULATION AT LEAST 8"

WITH WOOD OR PRECAST GYPSUM DECKS MOP FELT WITH PITCH FROM POINTS "B" TO "C" AND NAIL TO DECK FROM POINTS "A" TO "B".

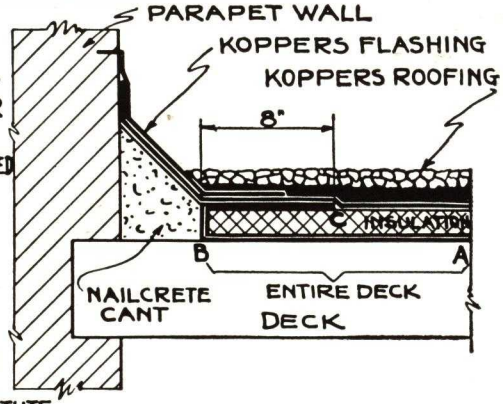
WITH POURED CONCRETE, POURED GYPSUM, PRECAST CONCRETE & BOOK TILE DECKS MOP FELT WITH PITCH FROM POINTS "A" TO "C".

WITH STEEL DECKS MOP FELT WITH STEEP ASPHALT FROM POINTS "A" TO "B" AND WITH PITCH FROM POINTS "B" TO "C".

WITH WATERPROOFING UNDER INSULATION

WHEN INSULATION IS APPLIED WITH WATERPROOFING ON UNDERSIDE, EDGES OF INSULATION SHALL BE PROTECTED BY EXTENDING THE UNDERSIDE PLIES OF TARRED FELT UP EDGES AND OVER INSULATION AT LEAST 8".

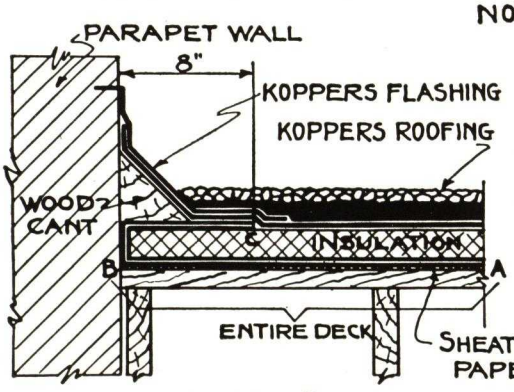
MOPPING OF FELT TO BE THE SAME AS DESCRIBED ABOVE FOR DIFFERENT TYPES OF DECKS, EXCEPT THAT POINTS "A" TO "B" WILL INDICATE THAT THE ENTIRE SPAN OF THE DECK WILL BE TREATED.



POURED CONCRETE, POURED GYPSUM, PRECAST CONCRETE BOOK TILE OR STEEL DECKS.

NOTE:-

WHEN ROOFS HAVE AN INCLINE OF FROM 2" TO 6" PER FOOT, SUBSTITUTE PITCH WITH STEEP PITCH WHEREVER PITCH IS CALLED FOR ABOVE.



WOOD DECK

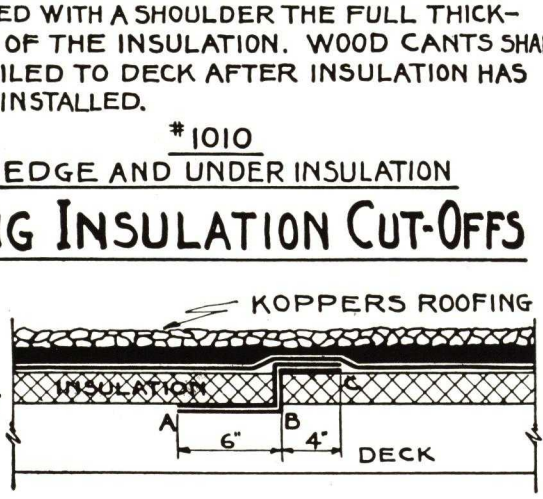
WHEN USING NAILCRETE CANT IT SHALL BE CONSTRUCTED WITH A SHOULDER THE FULL THICKNESS OF THE INSULATION. WOOD CANTS SHALL BE NAILED TO DECK AFTER INSULATION HAS BEEN INSTALLED.

*1010
EDGE AND UNDER INSULATION

METHOD OF INSTALLING INSULATION CUT-OFFS

AT THE END OF EACH WORKING DAY, EDGE OF INSULATION SHALL BE PROTECTED WITH 2 PLIES OF TARRED FELT IN A MANNER SO THAT WHEN THE NEXT DAYS WORK IS RESUMED, THERE SHALL BE A COMPLETED JOINT AS HERE SHOWN. WHEN CORK INSULATION IS USED, CUT-OFFS SHOULD BE REMOVED WHEN WORK IS RESUMED.

MOPPING OF FELT TO BE THE SAME AS DESCRIBED ABOVE FOR DIFFERENT TYPES OF DECKS.

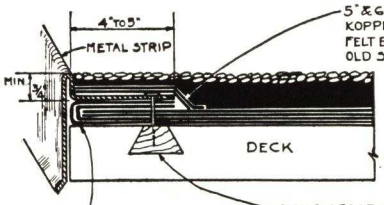


*1008
END OF DAYS WORK

TYPICAL METAL FINISHING STRIPS

FOR GRAVEL AND SLAG ROOFING WITHOUT INSULATION

EAVE # 1000

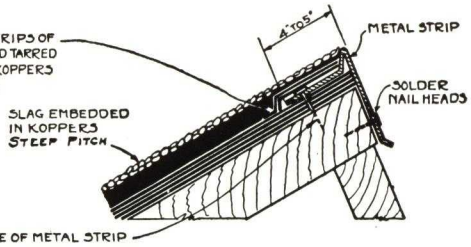


5" & 6" FLANGE STRIPS OF KOPPERS APPROVED TARRED FELT EMBEDDED IN KOPPERS OLD STYLE PITCH.

NAILS, SPACE 1" FROM EDGE OF METAL STRIP AND 3" APART. CREOSOTED WOOD NAILING STRIP FURNISHED WHEN DECK DOES NOT PERMIT NAILING.

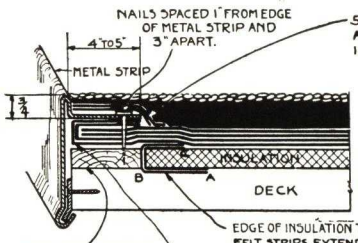
2 LOWER PLIES OF ROOFING FELT ARE TO BE TURNED UP OVER TOP PLIES OF FELT AND RUN BACK ON DECK AT LEAST FIVE INCHES.

RIDGE # 1001



FOR GRAVEL AND SLAG ROOFING. WITH INSULATION

EAVE # 1002



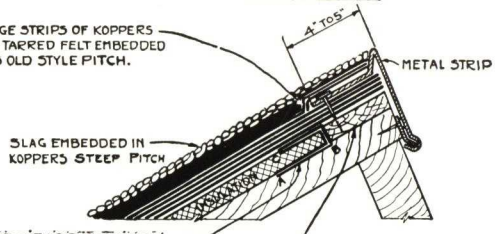
5" & 6" FLANGE STRIPS OF KOPPERS APPROVED TARRED FELT EMBEDDED IN KOPPERS OLD STYLE PITCH.

CREOSOTED EDGING STRIP. SEE NOTE OPPOSITE.

2 LOWER PLIES OF ROOFING FELT ARE TO BE TURNED UP OVER TOP PLIES OF FELT AND RUN BACK ON DECK AT LEAST 5 INCHES

EDGE OF INSULATION TO BE SEALED WITH 2 PLIES TARRED FELT STRIPS, EXTENDING 6" UNDER INSULATION AND 5" OVER INSULATION.
WITH CONCRETE, POURED GYPSUM, PRECAST CONCRETE AND BOOK TILE DECKS MOP WITH PITCH FROM POINTS A TO C. ON STEEL DECKS WITH KOPPERS TYPE 5 ASPHALT.
WITH WOOD AND PRECAST GYPSUM DECKS MOP WITH PITCH FROM POINTS B TO C AND NAIL FELT STRIPS SECURELY TO DECK.
WHEN THERE IS WATERPROOFING UNDER INSULATION EXTEND WATERPROOFING PLIES OF FELT AND MOPPINGS OF PITCH SO THAT THEY CAN BE TURNED BACK OVER THE TOP OF INSULATION 5".

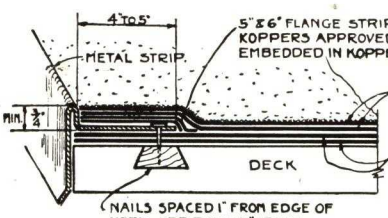
RIDGE # 1003



NOTE: CREOSOTED WOOD EDGING STRIP SECURELY FASTENED TO DECK CUT TO THE SAME WIDTH AS METAL FLANGE AND THE THICKNESS OF THE INSULATION.

FOR MINERAL SURFACED ROOFING WITHOUT INSULATION

SIDE EAVE # 1004



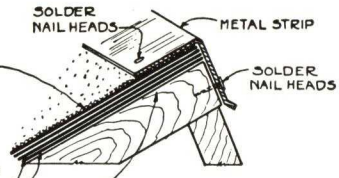
5" & 6" FLANGE STRIPS OF KOPPERS APPROVED TARRED FELT EMBEDDED IN KOPPERS TYPE 5 ASPHALT.

MINERAL SURFACED ROOFING EMBEDDED IN KOPPERS TYPE 5 ASPHALT

2 PLY KOPPERS APPROVED TARRED FELT NAILED TO DECK IN THE CASE OF WOOD OR PRECAST GYPSUM DECKS. 1 PLY FELT EMBEDDED IN KOPPERS TYPE 5 ASPHALT IN THE CASE OF CONCRETE, POURED GYPSUM, STEEL DECK ETC.

NAILS SPACED 1" FROM EDGE OF METAL STRIP AND 3" APART. CREOSOTED WOOD NAILING STRIP FURNISHED WHEN DECK DOES NOT PERMIT NAILING.

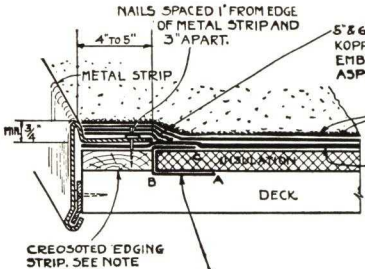
RIDGE # 1005



CREOSOTED WOOD NAILING STRIP FURNISHED WHEN DECK DOES NOT PERMIT NAILING.

FOR MINERAL SURFACED ROOFING WITH INSULATION

SIDE EAVE # 1006



5" & 6" FLANGE STRIPS OF KOPPERS APPROVED TARRED FELT EMBEDDED IN KOPPERS TYPE 5 ASPHALT.

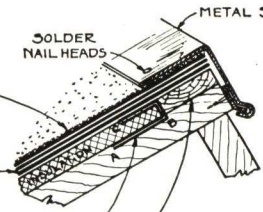
MINERAL SURFACED ROOFING EMBEDDED IN KOPPERS TYPE 5 ASPHALT.

1 PLY KOPPERS APPROVED TARRED FELT EMBEDDED IN KOPPERS TYPE 5 ASPHALT WHEN DECK IS CONCRETE, POURED GYPSUM OR STEEL ETC. 2 PLY KOPPERS FELT NAILED TO DECK WHEN DECK IS WOOD OR PRECAST GYPSUM.

CREOSOTED EDGING STRIP. SEE NOTE OPPOSITE.

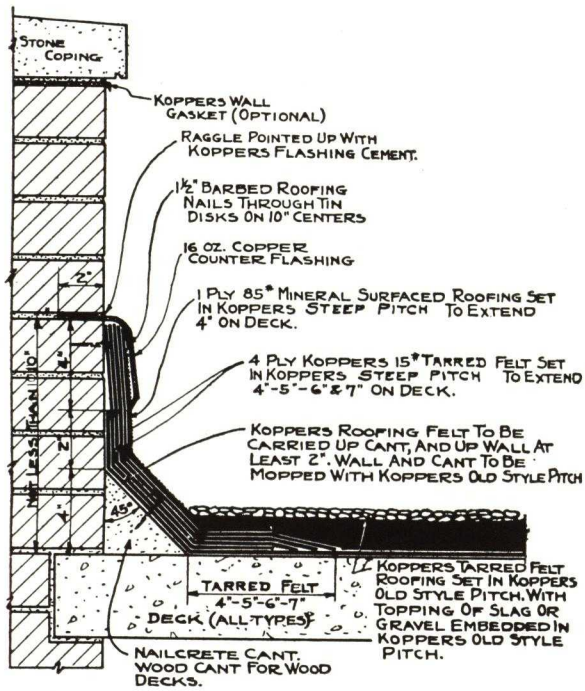
EDGE OF INSULATION TO BE SEALED WITH 2 PLIES TARRED FELT STRIPS EXTENDING 6" UNDER INSULATION AND 5" OVER INSULATION.
WITH POURED CONCRETE, POURED GYPSUM, PRECAST CONCRETE, BOOK TILE AND STEEL DECKS MOP WITH KOPPERS TYPE 5 ASPHALT FROM POINTS A TO C.
WITH WOOD OR PRECAST GYPSUM DECKS MOP WITH TYPE 5 ASPHALT FROM POINTS B TO C AND NAIL FELT STRIPS SECURELY TO DECK.
WHEN THERE IS WATERPROOFING UNDER INSULATION EXTEND WATERPROOFING PLIES OF FELT AND MOPPINGS OF ASPHALT SO THAT THEY CAN BE TURNED BACK OVER THE TOP OF INSULATION 5"

RIDGE # 1007

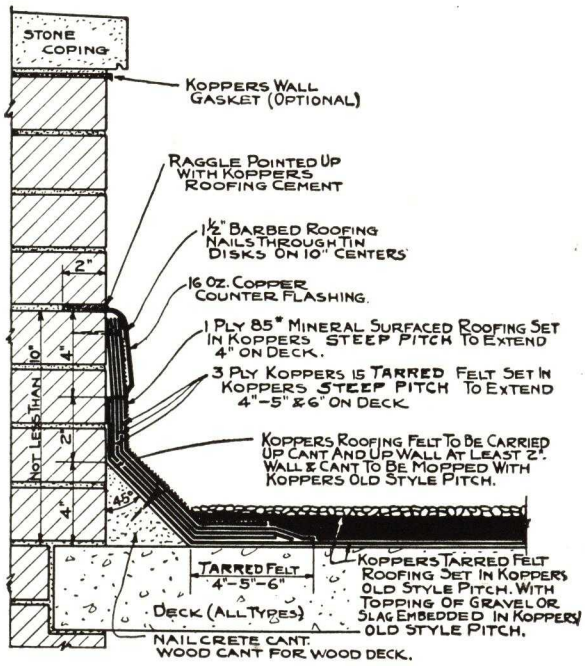


NOTE:- CREOSOTED WOOD EDGING STRIP SECURELY FASTENED TO DECK CUT TO THE SAME WIDTH AS METAL FLANGE AND THE THICKNESS OF THE INSULATION.

BOND. If a Koppers 10, 15 or 20-Year Guarantee Flashing Bond is required the flashing must be installed in connection with a Koppers Bonded Roof, the Flashing Bond being for no greater period than the Roofing Bond. Flashing and Roofing shall be installed by a roofing contractor approved by Koppers Company who shall apply Roofing and Flashing in strict accordance with the specifications and requirements of Koppers Company, and subject to their inspection and approval.



Koppers 20-Year Bonded Flashing Specification No. 107



Koppers 15-Year Bonded Flashing Specification No. 106

KOPPERS 20-YEAR BONDED FLASHING SPECIFICATION No. 107

BRIEF SPECIFICATION (For Architects and Engineers)
The flashing shall be installed according to KOPPERS Flashing Specification No. 107.

DETAILED SPECIFICATIONS

APPLICATION. Extend all plies of roofing felt and moppings of pitch up the wall two (2) inches above the cant strip.

Apply a uniform coating of KOPPERS Steep Pitch over the roofing extending from the raggle to not less than two (2) inches on to the roof deck. Into the Steep Pitch embed one (1) ply of KOPPERS 15-lb. Tarred Felt extending from the raggle to not less than two (2) inches on to the roof deck. On top of this flashing strip apply another uniform coating of KOPPERS Steep Pitch and another flashing strip. Repeat this application until a four-ply reinforcement has been completed. Each flashing strip shall extend on to the deck roofing one (1) inch beyond the preceding strip.

The top ply of flashing reinforcement shall be nailed in the middle of the cant every ten (10) inches with one and one-half (1½) inch barbed roofing nails through flat tin discs.

Coat the entire surface of the tarred felt flashing reinforcement strip uniformly with KOPPERS Steep Pitch and embed immediately one (1) layer of eighty-five (85) lb. mineral surfaced roofing cut so as to extend from the raggle to the deck angle. Reinforcing felt and mineral surfaced roofing shall be securely fastened at the top with one and one-half (1½) inch barbed roofing nails through flat tin discs to prevent slipping, nails to be spaced every ten (10) inches in the vertical mortar joints or nail strips.

All end joints of felt reinforcement strips shall break joints with underlying strip.

All felt reinforcement and mineral surface roofing strips shall not exceed ten (10) feet three (3) inches in length and there shall be a three (3) inch end lap between adjoining strips.

KOPPERS 15-YEAR BONDED FLASHING SPECIFICATION No. 106

BRIEF SPECIFICATION (For Architects and Engineers)
The flashing shall be installed according to KOPPERS Flashing Specification No. 106.

DETAILED SPECIFICATIONS

APPLICATION. Extend all plies of roofing felt and moppings of pitch up the wall two (2) inches above the cant strip.

Apply a uniform coating of KOPPERS Steep Pitch over the roofing extending from the raggle to not less than two (2) inches on to the roof deck. Into the Steep Pitch embed one (1) ply of KOPPERS 15-lb. Tarred Felt extending from the raggle to not less than two (2) inches on to the roof deck. On top of this flashing strip apply another uniform coating of KOPPERS Steep Pitch and another flashing strip. Repeat this application until a three-ply reinforcement has been completed. Each flashing strip shall extend on to the deck roofing one (1) inch beyond the preceding strip.

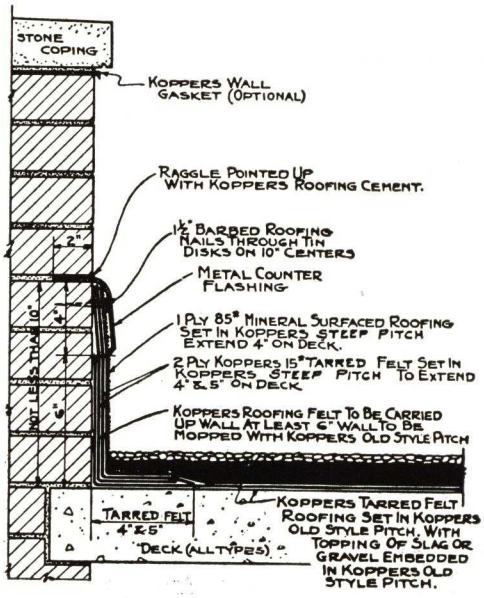
The top ply of flashing reinforcement shall be nailed in the middle of the cant every ten (10) inches with one and one-half (1½) inch barbed roofing nails through flat tin discs.

Coat the entire surface of the tarred felt flashing reinforcement strip uniformly with KOPPERS Steep Pitch and embed immediately one (1) layer of eighty-five (85) pound mineral surfaced roofing cut so as to extend from the raggle to the deck angle. Reinforcing felt and mineral surfaced roofing shall be securely fastened at the top with one and one-half (1½) inch barbed roofing nails through flat tin discs to prevent slipping, nails to be spaced every ten (10) inches in the vertical mortar joints or nail strips.

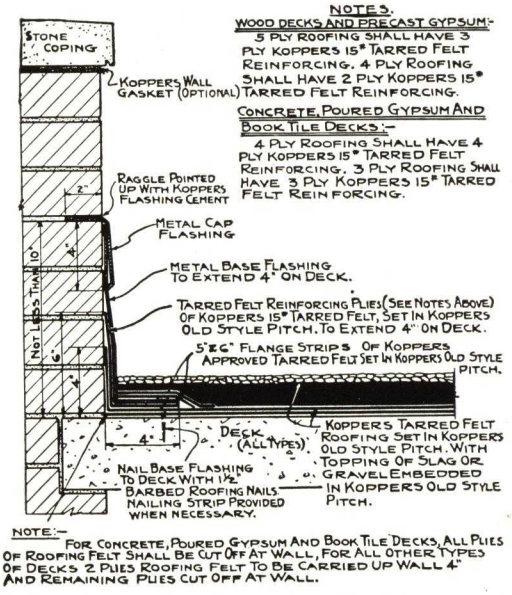
All end joints of felt reinforcement strips shall break joints with underlying strip.

All felt reinforcement and mineral surface roofing strips shall not exceed ten (10) feet three (3) inches in length and there shall be a three (3) inch end lap between adjoining strips.

METAL CAP FLASHING. Refer to details explained following Specification No. 101.



Koppers 10-Year Bonded Flashing Specification No. 101



Koppers Flashing Specification No. 100 (Not Bonded)

KOPPERS 10-YEAR BONDED FLASHING SPECIFICATION No. 101

DETAILED SPECIFICATIONS

APPLICATION. All plies of roofing felt and moppings of pitch shall be carried up perpendicular surfaces at least six (6) inches.

Apply a uniform coating of KOPPERS Steep Pitch to a height of not less than ten (10) inches on the perpendicular surface and four (4) inches out on the deck roofing into which embed one (1) ply of KOPPERS 15-Lb. Tarred Felt cut so as to completely cover the coating of KOPPERS Steep Pitch.

Coat this reinforcing strip of felt uniformly with KOPPERS Steep Pitch and install another reinforcing ply of KOPPERS 15-Lb. Tarred Felt. This strip to extend on to the deck roofing one (1) inch beyond the edges of the preceding strip.

Coat the entire surface of the tarred felt flashing reinforcement strip uniformly with KOPPERS Steep Pitch and embed immediately one (1) layer of eighty-five (85) pound mineral surfaced roofing cut so as to extend from the raggle to the deck angle. Reinforcing felt and mineral surfaced roofing shall be securely fastened at the top with one and one-half (1½) inch barbed roofing nails through flat tin discs to prevent slipping, nails to be spaced every ten (10) inches in the vertical mortar joints or nail strips.

All end joints of felt reinforcement strips shall break joints with underlying strip.

All felt reinforcement and mineral surface roofing strips shall not exceed ten (10) feet three (3) inches in length and there shall be a three (3) inch end lap between adjoining strips.

METAL CAP FLASHING FOR SPECIFICATIONS Nos. 101, 106 AND 107. Metal cap flashing shall be installed immediately so as to prevent seepage of water behind the base flashing. We recommend that 14 oz. cold rolled copper be used for 15 and 20-year flashing specifications.

Metal cap flashing shall extend into the raggle not less than two (2) inches and shall have a four (4) inch exposed apron extending down over the base flashing. After the metal cap flashing has been installed completely fill the raggle groove with KOPPERS Roof Cement.

METAL CAP AND BASE FLASHING— KOPPERS SPECIFICATION No. 100

BRIEF SPECIFICATION (For Architects and Engineers)
The flashing shall be installed according to KOPPERS Specification No. 100.

DETAILED SPECIFICATIONS

APPLICATION. When a metal base flashing is used, felt reinforcement at all wall angles, skylight curbs and other vertical surfaces shall be installed as follows:

BOARD AND PRECAST GYPSUM DECKS. The felt in the first two plies of the roof shall be carried up perpendicular surfaces at least four (4) inches, and the remaining plies cut off at the angle of the roof deck and perpendicular surfaces.

(*) Felt reinforcing plies shall then be set in separately, all cemented solidly together and to the underlying surface with pitch. The first ply shall extend out on the deck roofing at least four (4) inches, each ply extending one (1) inch beyond the preceding ply, and up the perpendicular surface at least six (6) inches; the last ply to be mopped with pitch before the metal base flashing is set in place. All end joints shall be broken with the underlying reinforcing strip.

CONCRETE, POURED GYPSUM, BOOK TILE DECKS. All plies of felt used in the roofing shall be cut off at the angle of the roof deck and perpendicular surfaces.

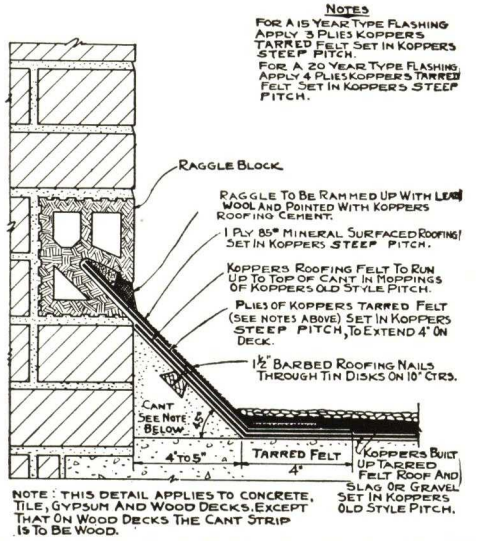
(**) Felt reinforcing plies shall then be set in separately, all cemented solidly together and to the underlying surface with pitch. The first ply shall extend out on the deck roofing at least four (4) inches, each ply extending one (1) inch beyond the preceding ply, and up the perpendicular surface at least six (6) inches; the last ply to be mopped with pitch before the metal base flashing is set in place. All end joints shall be broken with the underlying reinforcing strip.

INSTALLATION OF METAL BASE FLASHING. The metal base flashing shall extend up the wall not less than ten (10) inches and on the deck not less than four (4) inches. The base flashing shall be nailed to the deck, and if deck does not permit nailing a creosoted wood nailing strip must be provided. Nails shall be spaced not more than four (4) inches apart and within one (1) inch from the outer edge of the metal base flange.

Two (2) tarred felt strips shall then be applied over the entire metal base flange which extends on to the roof, the top strip extending two (2) inches beyond the lower strip, these strips to be not less than double the width of the flange and cemented solidly together and to the flange with pitch. Apply over the surface a mopping of pitch.

Cap Flashing shall be installed immediately so as to prevent seepage of water behind the base flashing.

* 5 Ply roofing shall have three (3) reinforcing plies.
4 Ply roofing shall have two (2) reinforcing plies.
** 4 Ply roofing shall have four (4) reinforcing plies.
3 Ply roofing shall have three (3) reinforcing plies.



Koppers Raggle Block Flashing Specification No. 102

KOPPERS RAGGLE BLOCK FLASHING SPECIFICATION No. 102

BRIEF SPECIFICATION (For Architects and Engineers)

The flashing shall be Raggle Block Type installed according to KOPPERS Specification No. 102.

DETAILED SPECIFICATIONS

APPLICATION. Extend all roofing plies of felt and moppings of pitch up the cant to the wall angle.

See that the flashing groove in the raggle block is free of all foreign material. Then apply a uniform coating of KOPPERS Steep Pitch over the roofing and extend it full depth into the flashing groove. Next insert one (1) ply of KOPPERS 15-Lb. Tarred Felt full depth into the Raggle Groove and extend it two (2) inches on to the roof deck. On top of the flashing reinforcement strip apply another uniform coating of KOPPERS Steep Pitch and another flashing strip, this strip to extend on to roofing deck felts one (1) inch beyond the preceding strip. Repeat this application until a three (3) ply 15-Year Type or four (4) ply 20-Year Type reinforcement has been completed.

Felt reinforcement flashing strips shall not exceed ten (10) feet three (3) inches in length and there shall be a three (3) inch end lap between adjoining strips. A uniform coating of KOPPERS Steep Pitch shall be applied between laps.

Each flashing reinforcement strip shall be set in separately and joints must be broken with the underlying flashing reinforcement strip.

The top of flashing reinforcement shall be nailed in the middle of the cant every ten (10) inches with one and one-half (1½) inch barbed roofing nails through flat tin discs.

Over the entire reinforcement strip, and into the full depth of the raggle apply a uniform coating of KOPPERS Steep Pitch, into which embed one (1) layer of eighty-five (85) pounds Mineral Surfaced Roofing extending from the full depth of the raggle groove not less than three (3) inches on to the roof deck.

Mineral surfaced roofing strips shall not exceed ten (10) feet three (3) inches in length and there shall be a three (3) inch lap between adjoining strips. A uniform coating of KOPPERS Steep Pitch shall be applied between laps.

Insert lead wool into the full depth of the raggle groove, pressing firmly into place, then fill the raggle completely with KOPPERS Roof Cement.

GENERAL. All tarred felt and mineral surfaced roofing shall be free from wrinkles and buckles.

DAMPPROOFING AND WATERPROOFING FLOORS OF SUPERSTRUCTURES

Dampproofing—Paint Method

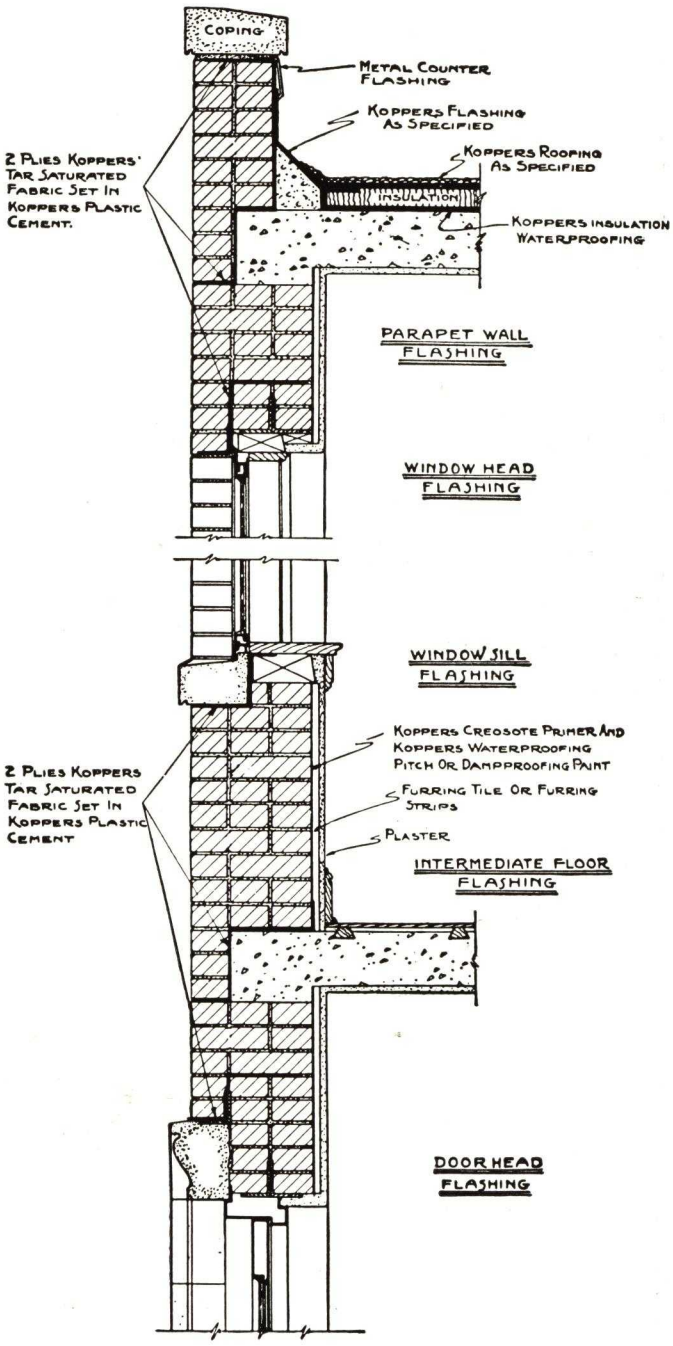
The concrete floor slab shall be given a smooth finish. As soon as the cement finish has taken its initial set, one spray or brush coating of Koppers Dampproofing Paint shall be applied. Six (6) to twenty-four (24) hours later a second application shall be made. Painting shall be continued up the walls for not less than four (4) inches. One gallon of paint shall be used for each one hundred (100) square feet of surface. Green concrete which has been painted with Koppers Dampproofing Paint does not require sprinkling with water for curing. But if desired, the two coatings of paint can be applied after the concrete is dry. The wood sub-floor or finished cement floor shall be laid eight (8) to twenty-four (24) hours after the second application of paint.

Membrane Waterproofing—Wood Floors

Lay over the entire surface two (2) thicknesses of red rosin paper (weighing not less than five (5) pounds per one hundred (100) square feet) lapping each sheet nineteen (19) inches over the preceding sheet. Nail to hold in place. Lay one (1) thickness of Approved Tarred Felt with two (2) inch side laps and six (6) inch end laps and nail as required to hold in place. Mop the entire surface with Old Style Pitch and into the pitch lay one (1) ply of Approved Tarred Felt with side laps of two (2) inches and end laps of six (6) inches. All laps shall be mopped so that in no place does felt touch felt. The entire surface shall then be mopped with pitch and the floor plank shall be embedded in the hot pitch. At corners and angles two additional plies of felt shall be installed, alternately mopped and run up the walls, etc., not less than three (3) inches above the level of the finished flooring, where they shall be fastened securely and protected. The finished flooring shall be nailed to the embedded plank immediately. Nails of suitable length shall be used to avoid penetrating through planks into the waterproofing.

Membrane Waterproofing—Poured Concrete Floors

Lay over the entire surface two (2) thicknesses of Approved Tarred Felt, lapping each sheet seventeen (17) inches over the preceding sheet, mopping the full width of the lap with Old Style Pitch so that in no place does felt touch felt. Then coat the entire surface with Old Style Pitch. Not less than seventy (70) Pounds of pitch shall be used for completing the waterproofing on each one hundred (100) square feet of surface. At all corners and angles two additional plies of felt shall be installed and mopped similarly and these shall be carried up the walls, etc., not less than three (3) inches above the level of the finished flooring where they shall be fastened securely and protected. The finished flooring shall be installed immediately.



KOPPERS SPANDREL AND WALL WATERPROOFING

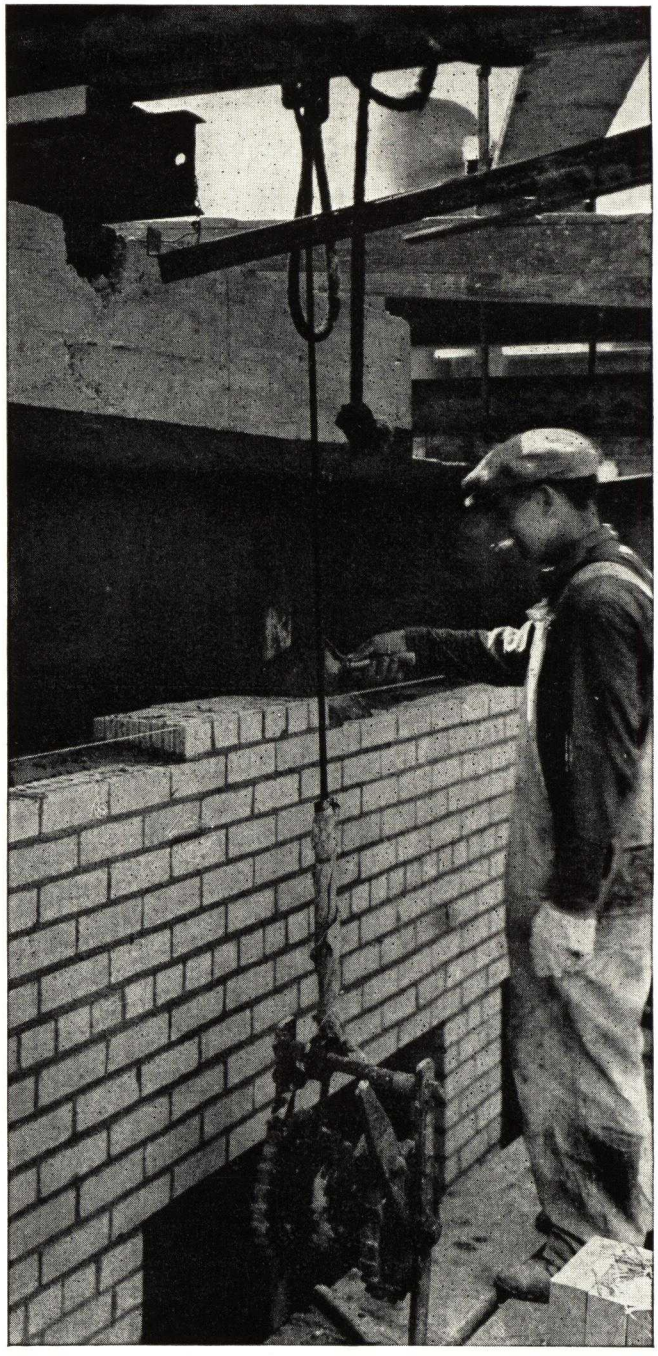
Every building of masonry construction should have adequate flashings built through the walls to impede the movement of moisture through inter-connecting voids in the masonry. These flashings protect spandrel beams, reinforcing steel, steel window and door frames against corrosion. Coating the interior surfaces of all exterior walls with Koppers Waterproofing Pitch or Koppers Dampproofing Paint produces a moisture-repellent film between the structural walls and furring.

Specification—Install flashings as shown on detail. In all places two (2) plies of Koppers Tarred Fabric set in two (2) trowel coatings of Koppers Plastic Cement shall be constructed. All flashing shall terminate one-half (½) inch from wall exteriors.

The interior surfaces of all exterior walls shall be brushed or sprayed with Koppers Concrete Priming Oil, using one (1) gallon for each two hundred (200) square feet. Eight (8) to twenty-four (24) hours later the well primed surfaces shall be mopped with Koppers Waterproofing Pitch. Two (2) coatings using a total of thirty (30) pounds of pitch for each one hundred (100) square feet shall be applied, permitting the first coating to cool before applying the second.

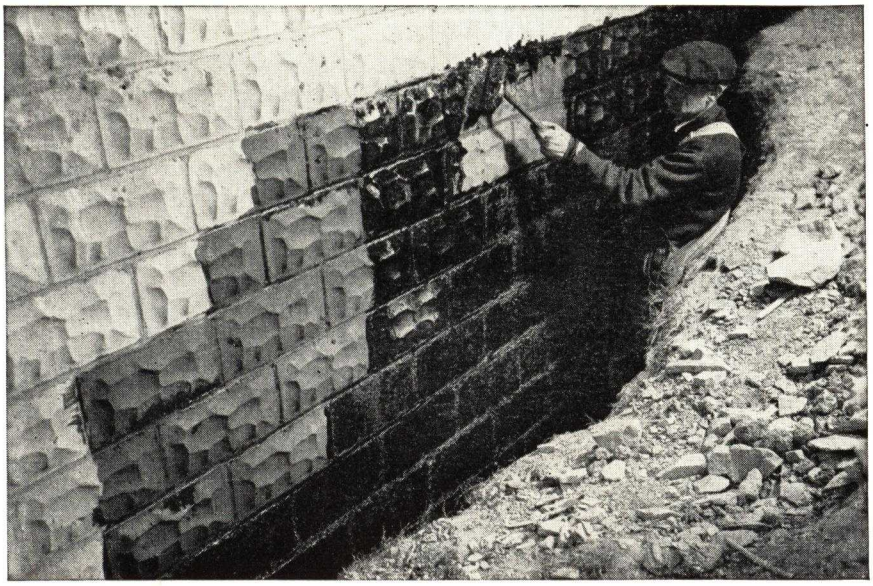
Alternate—(To be used in place of pitch moppings.).

Two coatings of Koppers Dampproofing Paint shall be applied by brush or spray using not less than one (1) gallon for each one hundred and fifty (150) square feet of surface and permitting the first coating to dry for not less than three (3) hours before making the second application.



Koppers Spandrel Waterproofing

Two plies of Koppers Tar Saturated Fabric set in two trowel coatings of Koppers Tar Base Plastic Cement. The dry surface of the outer ply of fabric keeps the bricks clean.



Applying Koppers High Penetration Primer and Seal Coat by Brush

KOPPERS DAMPPROOFING AND TERMITE PROOFING—PITCH METHOD

USES. For all brick or concrete foundations and abutments where back-fill will be used.

DETAILED SPECIFICATIONS

APPLICATION. Note—The surfaces should be free from all dirt. All cracks should be thoroughly wetted with water and then filled with Portland Cement Mortar.

First—Over the entire surface to be dampproofed apply a uniform brush coat of KOPPERS Concrete Priming Oil. Approximately one (1) gallon should be used for each one hundred (100) square feet.

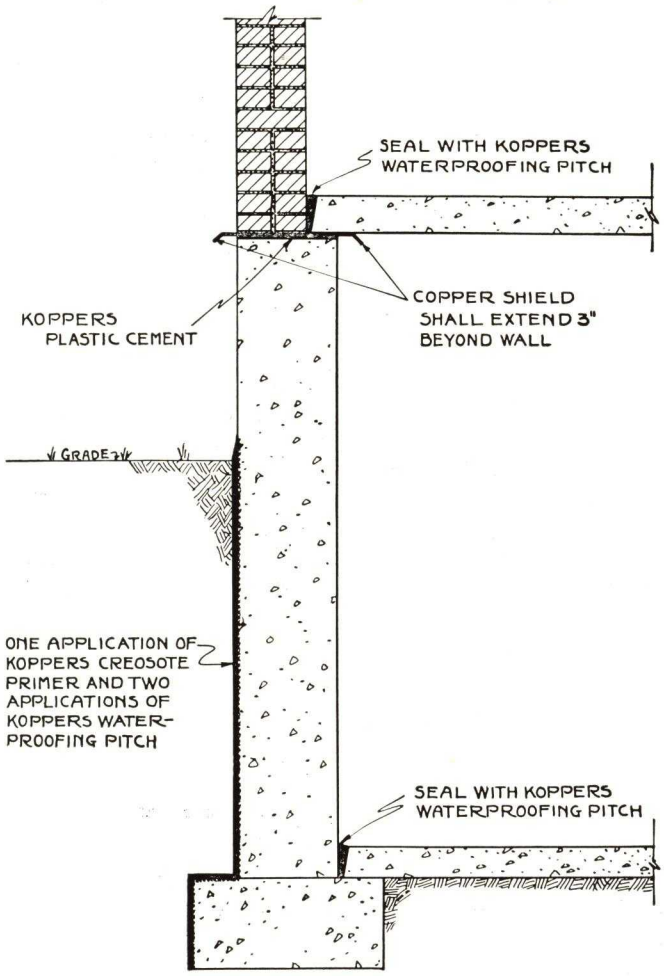
Second—Apply a mopping of KOPPERS Waterproofing Pitch. Approximately twenty-five (25) pounds per one hundred (100) square feet shall be used and the pitch shall be heated to a temperature at which it is entirely liquid, but this temperature shall not exceed three hundred and seventy-five (375) degrees Fahrenheit.

Third—A second mopping of Waterproofing Pitch shall then be applied over the entire surface of the first mopping. Approximately twenty-five (25) pounds per one hundred (100) square feet shall be used so that the entire amount of pitch applied shall amount to a total of approximately fifty (50) pounds per one hundred (100) square feet.

Fourth—The permanent back-fill shall be tamped into place immediately after the last mopping is applied.

Fifth—For additional protection against termites, coal tar pitch seals shall be provided at all places where floor slabs join foundation walls and between adjacent slabs. Seals shall be completely filled with KOPPERS Waterproofing Pitch. Also 20 oz. copper shields set in KOPPERS Plastic Cement shall be installed on top of all foundation walls as detailed.

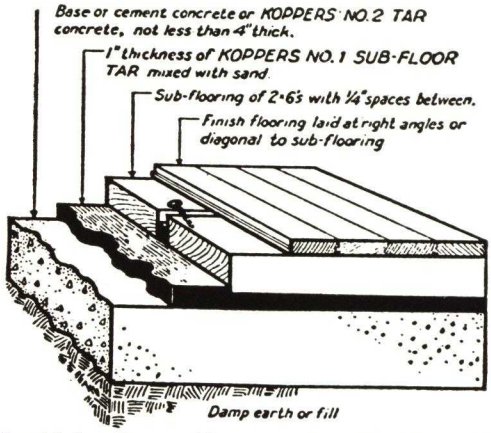
Note—Use KOPPERS Membrane Waterproofing when a head of water is encountered. See Page 32.



KOPPERS
DAMP AND TERMITE PROOFING
PITCH METHOD

KOPPERS SUB-FLOOR TAR DAMPPROOFING

In basements where the ground is damp and it is desired to use a wood finish floor, an effective dampproofing is necessary. The earth should be leveled off to proper grade. If earth or cinder fill is used it should be puddled and rolled or tamped to thoroughly compact it. The sub-base may be either a cement-concrete slab installed in the usual way, or a slab of KOPPERS No. 2 SUB-FLOOR TAR concrete. A cubic yard of crushed stone or gravel passing a 2¼" sieve but retained on a ¼" sieve is mixed with approximately 10 gallons of KOPPERS No. 2 SUB-FLOOR TAR which has been heated. This should be thoroughly rolled or tamped and brought to accurate grade.



Over the slab the dampproofing course is placed. One cubic yard of clean torpedo sand is heated (210° to 250° F.) and mixed with 25 to 30 gallons of KOPPERS No. 1 SUB-FLOOR TAR at the same temperature. The mixture is spread evenly over the slab to a thickness of from 1¼" to 1½" and leveled with a straight edge.

Well dried or treated planks are laid on this soft mixture before it cools and bedded by hammering, so that the coating compacts to a thickness of 1". If any plank is hammered below level, it is raised and more of the mixture applied beneath it. After the planks have been brought to proper level they are toenailed together. The sub-floor planks are preferably pressure treated with coal tar creosote meeting the Grade 1 specifications of the American Wood Preservers' Association. In food factories, creameries, etc., where the odor of creosote might be objectionable, the planks should be treated with a suitable salt preservative such as zinc chloride or Wolman salts. Planks to be creosoted should be dried before treatment. When a salt preservative is used, the planks should be dried after treatment, whether or not they were dried before treatment.

The finish floor is then laid at right angles or diagonal to the planks in the usual manner.

KOPPERS produces creosote, and treats wood with creosote, zinc chloride and Wolman salts. Complete information about creosote or treated lumber sent on request.

KOPPERS DAMPPROOFING—HIGH PENETRATION METHOD

USES. KOPPERS HP Primer is used with KOPPERS Seal Coat for protecting cement concrete against the disintegrating action of water. Concrete is permanent only when it is protected from the alkalies and sulphates often found in ground, lake, and sea waters. Continued contact with water also changes the structure of some of the chemical constituents of cement concrete, thus causing the concrete to lose some of its inherent strength. KOPPERS HP Primer penetrates the surface of the concrete making it water-repellent. KOPPERS Seal Coat seals the surface thus protecting it from erosion. This treatment is used particularly for dampproofing foundations, bridge abutments, basement and retaining walls, culverts, reservoirs, dams, sumps, pits, vats, tanks, and sewage disposal plants. On reinforced concrete this treatment also gives added protection to the reinforcing steel.

KOPPERS High-Penetration Primer and Seal Coat meet the United States Bureau of Public Roads, Specification TW-1-X and TR-1-25.

DETAILED SPECIFICATION

POURED CONCRETE

APPLICATION. Note—The concrete need not be thoroughly dry. Application of the HP Primer can begin as soon as forms are removed.

First—Apply with a brush, or spray a uniform coating of KOPPERS High-Penetration Primer over the entire surface to be protected. This first coating usually is absorbed as applied.

Second—Immediately apply in the same manner another coating of KOPPERS High-Penetration Primer over the first coating, allowing this coating to penetrate into the concrete.

Third—Repeat the same application as described under No. 2 until four (4) coatings have been applied. The last coatings may require one (1) or two (2) hours to be absorbed.

Fourth—Apply over the entire surface with a brush one (1) application of KOPPERS Seal Coat. This material shall be applied at a temperature from about eighty (80) to one hundred (100) degrees Fahrenheit. Allow the KOPPERS Seal Coat to dry thoroughly before disturbing the job.

Note—The application according to this specification will require about two (2) gallons of KOPPERS High-Penetration Primer and approximately one-half (½) gallon of KOPPERS Seal Coat per one hundred (100) square feet.

Superstructures—On Masonry superstructure exteriors, such as parapet walls, walls of buildings, etc., KOPPERS Lumino is used over HP Primer to give the surface an aluminum finish. Send for the Lumino folder.

PRECAST CONCRETE

Note—The precast piles or slabs shall be reasonably dry.

First—Prepare a bath of KOPPERS High-Penetration Primer large enough to accommodate the precast units and completely immerse these units for at least thirty (30) minutes, then remove the units from the bath and allow to drain and dry thoroughly.

Second—Apply a coating of KOPPERS Seal Coat, brushing thoroughly into the surfaces. The Seal Coat shall be applied at a temperature of from eighty (80) to one hundred (100) degrees Fahrenheit. Allow the Seal Coat to dry before disturbing the job.

KOPPERS MEMBRANE WATERPROOFING

KOPPERS Membrane Waterproofing is constructed in place by mopping plies of KOPPERS Tar Saturated Open Mesh Cotton Fabric and/or KOPPERS Approved Tarred Felt with KOPPERS Waterproofing Pitch. This produces a strong, elastic, continuous waterproofing blanket.

USES. KOPPERS Membrane Waterproofing below ground excludes moisture and water under head from basements, cellars, tunnels, shafts, sidewalk vaults, storage pits, sumps, etc.,—and the loss of water is prevented through reservoir walls, concrete or masonry storage tanks, swimming pools, basins, etc. Above ground it is recommended to prevent the passage of water through railroad and highway bridge decks, elevated highways, stadiums, masonry standpipes, swimming pools, shower baths, and the floors of dairies, abattoirs, and hotel kitchens.

GENERAL SPECIFICATIONS

The number of plies of KOPPERS Tar Saturated Fabric and/or KOPPERS Tarred Felt to be used depends upon the maximum hydrostatic head. Three (3) plies, and four (4) moppings of pitch (total 140 pounds of pitch for each 100 sq. ft.) are used on floors, bridge decks, shower baths, etc., not exposed to excessive heads of water. Water reservoirs, deep foundations, etc., require additional plies and moppings of pitch. Membrane waterproofings constructed with tarred fabric are tougher and stronger than those constructed with tarred felts, but otherwise are not superior to the latter. Tarred fabric is recommended particularly for use on bridges, roadways, tunnels, railroad track and machine isolation, under heavily loaded columns and where the waterproofing is exposed to vibration. On some projects it is economical to use tarred felt in the lower plies and tarred fabrics in the outermost ply adjacent to the protection course.

PREPARATION OF SURFACE. All surfaces which are to be waterproofed shall be reasonably smooth and free from projections or holes which might cause puncture of the membrane. The surface shall be dry so as to prevent the formation of steam when the hot pitch is applied and, immediately before the application of the waterproofing, the surface shall be thoroughly cleaned of dust and loose materials. No waterproofing shall be applied in wet weather or when the air temperature is below 35° F. unless vertical surfaces are heated and dried by salamanders, and horizontal surfaces are heated for one to two hours with a two-inch layer of hot sand. After the concrete is warm and thoroughly dry, the sand shall be swept back as work progresses.

APPLICATION OF WATERPROOFING. First—Beginning at the low point of the surface thoroughly mop a strip of concrete with KOPPERS Waterproofing Pitch. This mopping and all succeeding moppings on the concrete surface shall cover the concrete so that in no place shall gray spots be visible. Immediately following the first mopping, press the first strip of fabric into the hot pitch so that it is smoothly and firmly bonded to the concrete.

Second—Mop the edge of the first strip of fabric and the adjacent strip of concrete with KOPPERS Waterproofing Pitch, and into the hot pitch press a strip of fabric so that it forms a two (2) inch side lap with the first strip.

Third—Repeat the above application until one ply of fabric with two (2) inch laps has been laid over that portion of the surface designated by the waterproofing engineer.

Fourth—Again starting at the low point of the surface mop the first layer of fabric with hot pitch so that all threads of the fabric are completely hidden by pitch and into this press a strip of fabric which has been cut so as to break joints at the middle, one-third (⅓) or other portion of the width of the first ply of fabric, depending on the number of plies to be used.

Fifth—Repeat the above application using full width fabric until two plies of fabric have been laid over the surface.

Sixth—Apply the third and succeeding plies of fabric in the same way, making sure that fabric does not touch fabric in any place.

Seventh—Mop the entire top with KOPPERS Waterproofing Pitch. The completed waterproofing shall be firmly bonded membrane, and fabric shall not be exposed in any place.

Eighth—As soon as any portion of the waterproofing has been completed it shall be covered by the specified protection course—concrete, brick, tile or other suitable material.

GENERAL. Laps—Each sheet of fabric shall overlap the preceding sheet not less than two (2) inches at the sides. End laps shall be staggered at least twenty-four (24) inches from the end lap of the preceding ply.

End laps shall be not less than ten (10) inches wide.

The waterproofing shall be applied so that the direction of the flow of water is over and not against the laps.

Laps which have been exposed for any length of time shall be carefully examined for defects before connecting with other fabric and where any defects or insufficient lap areas are found the protection course shall be cut back sufficiently to give a proper lap between the membrane in place and the new work which is being applied.

DETAILS. All plies of fabric shall be rolled or pressed firmly into the hot pitch and shall be laid without wrinkles, buckles or kinks.

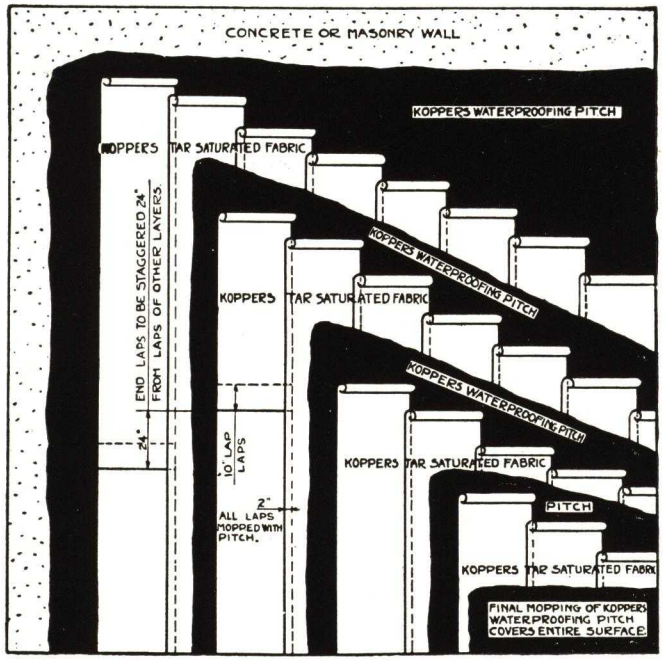
Pitch shall not be heated above three hundred and seventy-five (375°) degrees Fahrenheit.

All wall angles, corners or any place where in the opinion of the engineer or architect the waterproofing course may be subject to unusual strain there shall be applied on the water pressure side not less than two (2) additional reinforcement plies of fabric and moppings of pitch.

Insulate all hot water and steam pipes which project through or are near the surfaces to be waterproofed so as to prevent injury to the waterproofing. Extra plies of fabric and other precautions should be taken to prevent water from getting between the waterproofing and the waterproofed surface at all points where the membrane is penetrated by drains, pipes, etc.

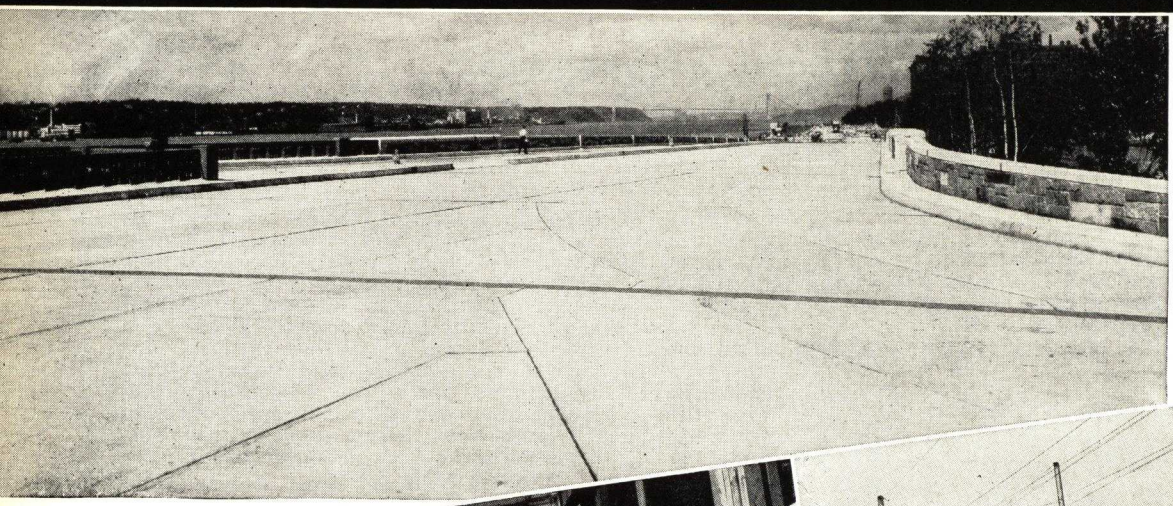
Plies of KOPPERS Tar Saturated Fabric or KOPPERS Approved Tarred Felt	Alternate Moppings of KOPPERS Waterproofing Pitch Required	Pounds of Pitch Required to Complete each 100 sq. ft. of Waterproofing
2	3	105
3	4	140
4	5	175
5	6	210
6	7	245

All membrane waterproofing shall be applied by an experienced waterproofing contractor.

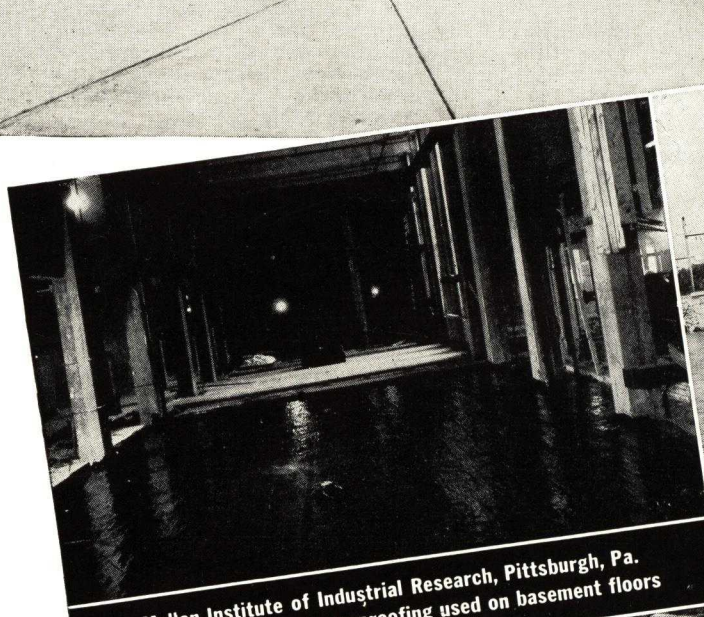


Typical Application 4 Ply

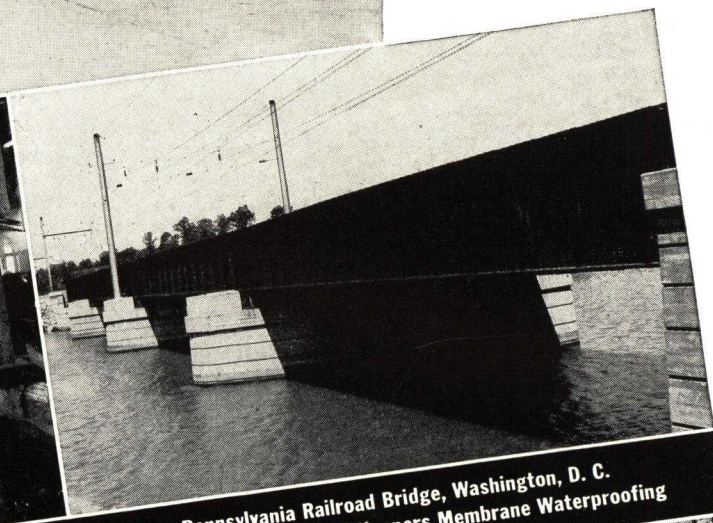
STRUCTURES PROTECTED BY KOPPERS MEMBRANE



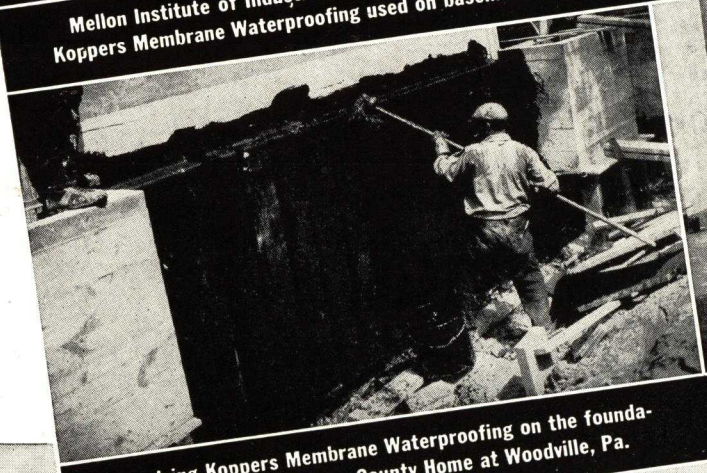
Westside Elevated Highway—W. 72 to W. 79 St., New York City. Koppers Membrane Waterproofing used on this project.



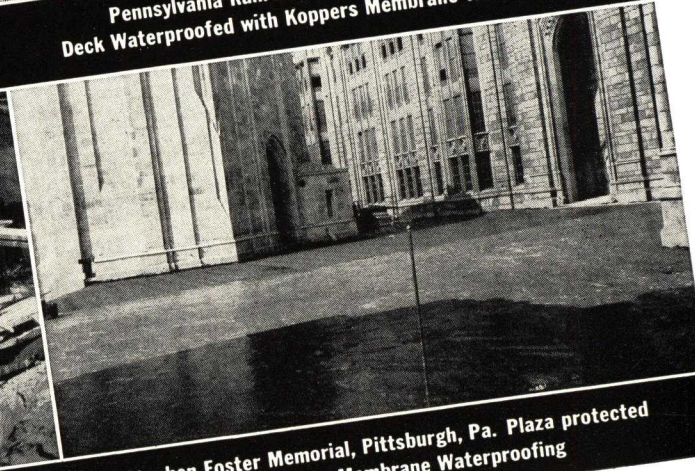
Mellon Institute of Industrial Research, Pittsburgh, Pa. Koppers Membrane Waterproofing used on basement floors



Pennsylvania Railroad Bridge, Washington, D. C. Deck Waterproofed with Koppers Membrane Waterproofing



Applying Koppers Membrane Waterproofing on the foundations of the Allegheny County Home at Woodville, Pa.

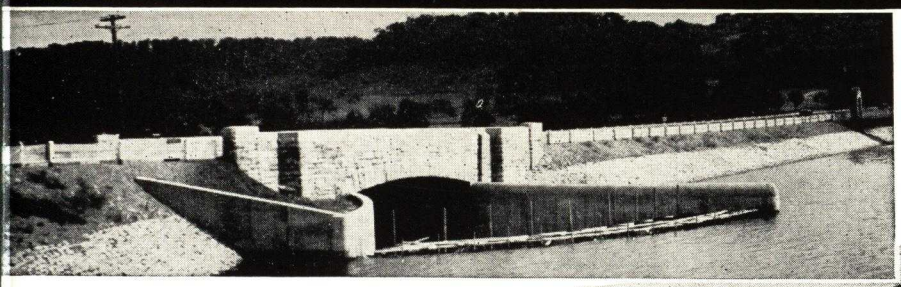


Stephen Foster Memorial, Pittsburgh, Pa. Plaza protected with Koppers Membrane Waterproofing

Koppers Gasproofing and Waterproofing on the sludge digestion tanks at the new sewage treatment plant at Columbus, Ohio. (In the background is a gas holder constructed by Koppers Company, Bartlett Hayward Division).

KOPPERS WATERPROOFING AND DAMPPROOFING SPECIFICATIONS

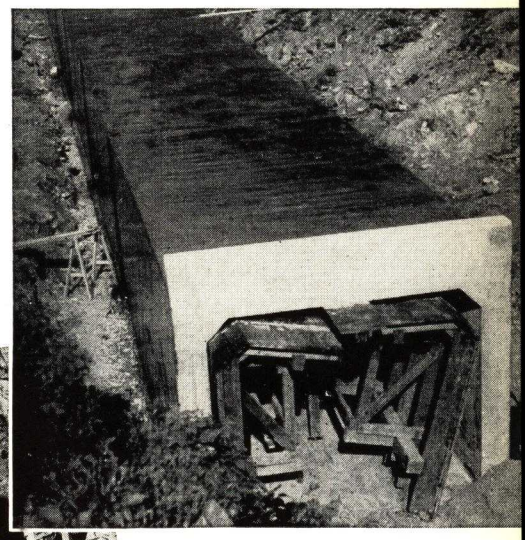
WATERPROOFING AND KOPPERS DAMPPROOFING

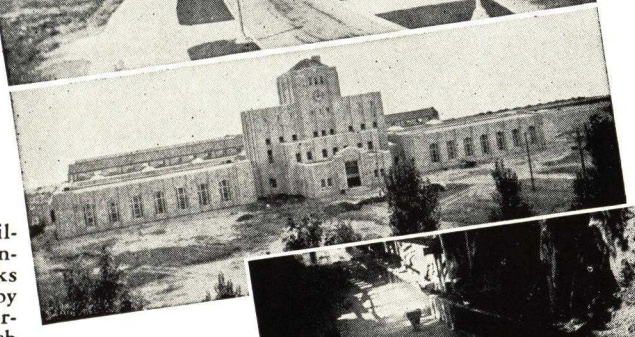


Artificial lake at North Park, Allegheny County, Pa. Under this roadway is a concrete dam which was protected with Koppers Dampproofing before the earth fill was made against it. The floor of the bridge is protected with Koppers Membrane Waterproofing.

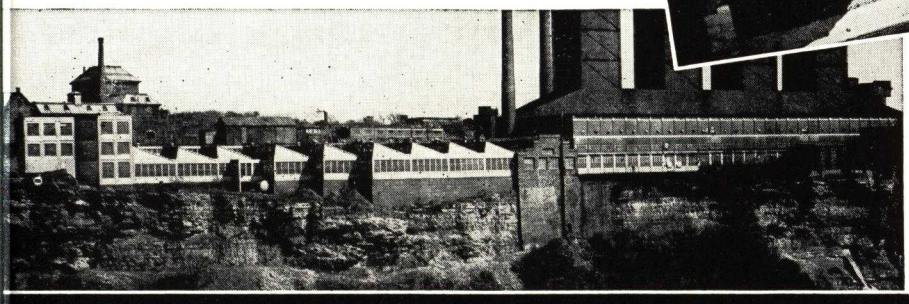
Waterproofing applied to concrete culverts through which Banksville Run was diverted in the relocation of Banksville Road, Pittsburgh, Pa.

Outer Drive—Chicago, Ill. Illinois Central 47th Street Viaduct protected with Koppers Membrane Waterproofing on deck.





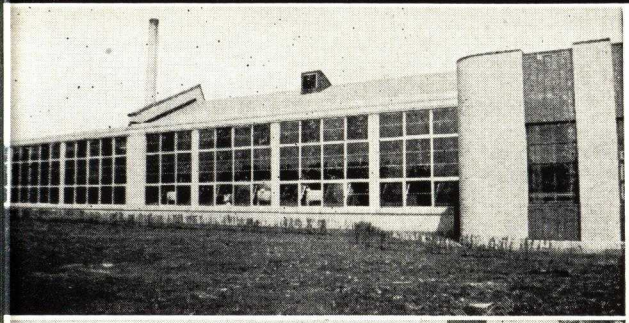
Water Filtration Plant, Milwaukee, Wisconsin. Concrete Water Storage tanks and conduits protected by Koppers Membrane Waterproofing. Koppers Pitch and Felt Roofing applied on all flat decks.



Koppers Waterproofing being applied around the base of the underpass to the plant of the Pittsburgh Plate Glass Company (under the tracks of the Pennsylvania Railroad) at Ford City, Pa.

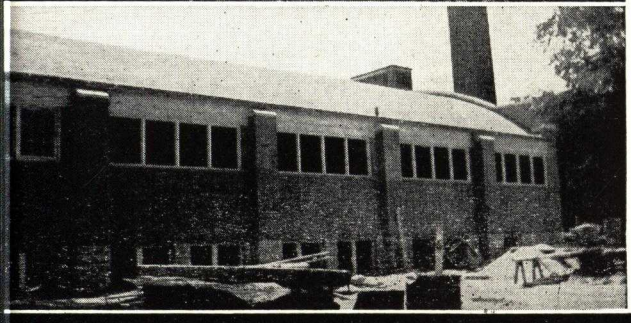
Aluminum Company Plant, Niagara Falls, N.Y. Sides of concrete saw teeth and three story concrete building painted with Koppers High Penetration Primer and Lumino.

TYPICAL KOPPERS STEEP ROOFS WITH SLAG SURFACES

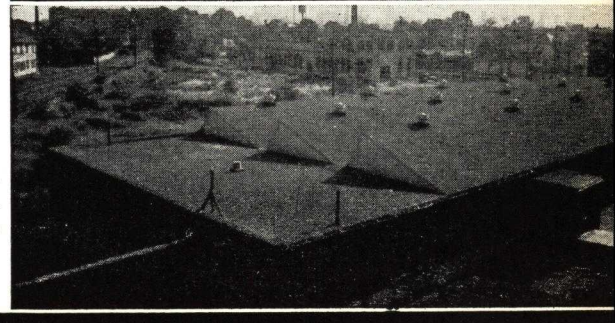


Baby Food Factory. Harold H. Clapp, Inc. Rochester, N.Y.

Episcopal High School Gymnasium, Alexandria, Virginia.



St. Charles High School Gymnasium, St. Charles, Missouri.



Receiving and Storing Building, American Tobacco Company, Dayton, Ohio.

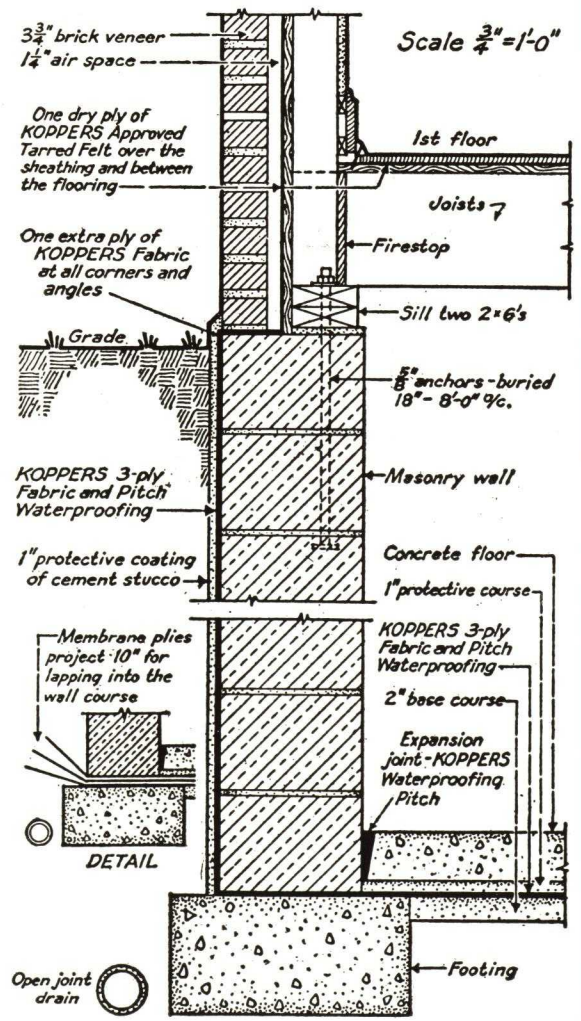
KOPPERS WATERPROOFING AND DAMPPROOFING SPECIFICATIONS

PENCIL POINTS DATA SHEETS

WATERPROOFING OF RESIDENCE FOUNDATIONS

Prepared by Don Graf, B.S., M.Arch.

Sheet No. F9 KOPPERS COMPANY PITTSBURGH

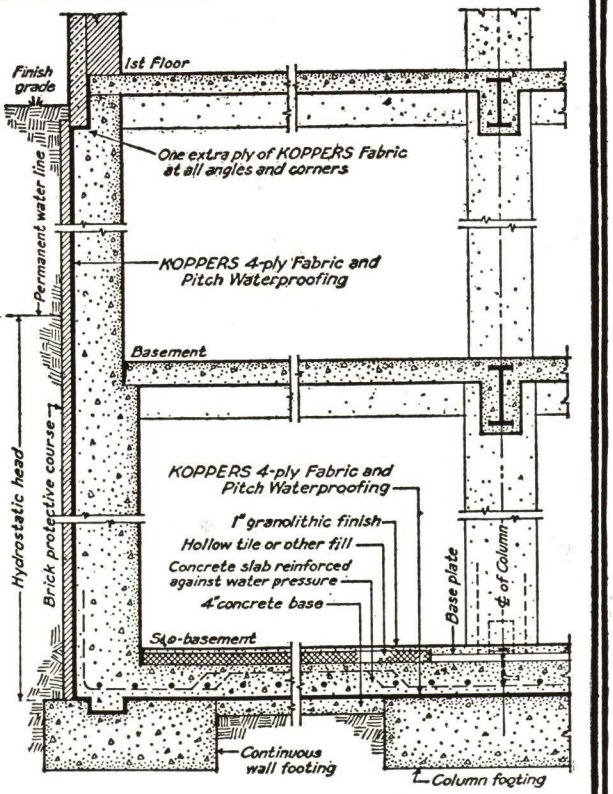


PENCIL POINTS DATA SHEETS

WATERPROOFING OF DEEP FOUNDATIONS

Prepared by Don Graf, B.S., M.Arch.

Sheet No. F9 KOPPERS COMPANY PITTSBURGH



In the construction of deep basements having unfavorable water conditions, the waterproofing method is shown here. The KOPPERS 4-ply Fabric and Pitch Waterproofing membrane will withstand a hydrostatic head up to 18'. From 18' to 25' 5 plies are used. A sheet of 20-oz. soft rolled copper should be placed between the plies beneath all columns, posts or walls under which the pressure exceeds 400 lbs. per sq. inch.

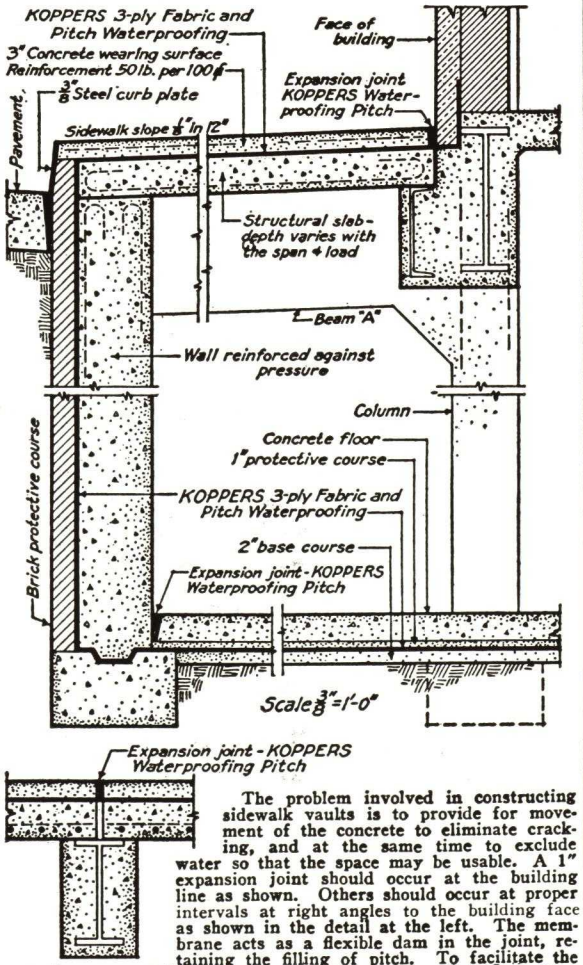
The sub-basement floor is reinforced as a flat slab to resist the upward pressure of the water. Inverted beams may be used, but these necessitate a greater amount of fill to bring the construction to a level to receive the wearing surface. If piles are used, the footings shown above become the pile cappings. No dowels need be run through the membrane.

PENCIL POINTS DATA SHEETS

WATERPROOFING OF SIDEWALK VAULT

Prepared by Don Graf, B.S., M.Arch.

Sheet No. F9 KOPPERS COMPANY PITTSBURGH



The problem involved in constructing sidewalk vaults is to provide for movement of the concrete to eliminate cracking, and at the same time to exclude water so that the space may be usable. A 1" expansion joint should occur at the building line as shown. Others should occur at proper intervals at right angles to the building face as shown in the detail at the left. The membrane acts as a flexible dam in the joint, retaining the filling of pitch. To facilitate the movement of the slabs, 2 dry plies of Koppers Approved Tarred Felt are placed between the bottom of the slab and its bearing surface on beams or wall, thus breaking the joint.

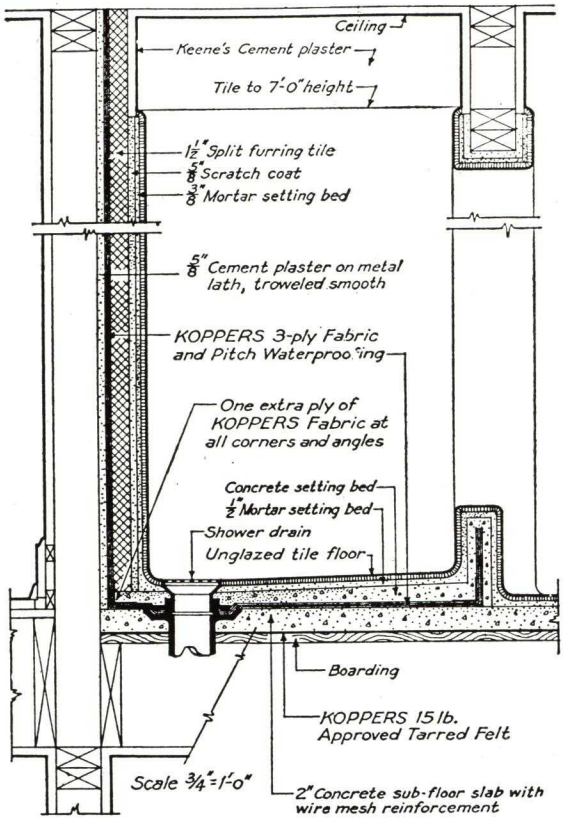
PENCIL POINTS DATA SHEETS

SHOWER BATH CONSTRUCTION

Prepared by Don Graf, B.S., M.Arch.

Sheet No. **D6**

KOPPERS COMPANY PITTSBURGH



The usual sizes for shower stalls are as follows:—30 x 36, 30 x 42, 36 x 36, 36 x 42, 42 x 42. Where space permits, the largest size given is desirable. Showers less than 36 x 36 in the clear should only be planned when space conditions make it mandatory. The door opening may be closed either with a water-proof curtain or any of the standard shower stall doors having ventilating panels.

The floor of the shower should be of an unglazed or abrasive tile, to prevent slipping. Glazed or unglazed tiles may be used for the walls at the discretion of the designer. Floor drains vary from 1½" to 3" wastes. The larger the better.

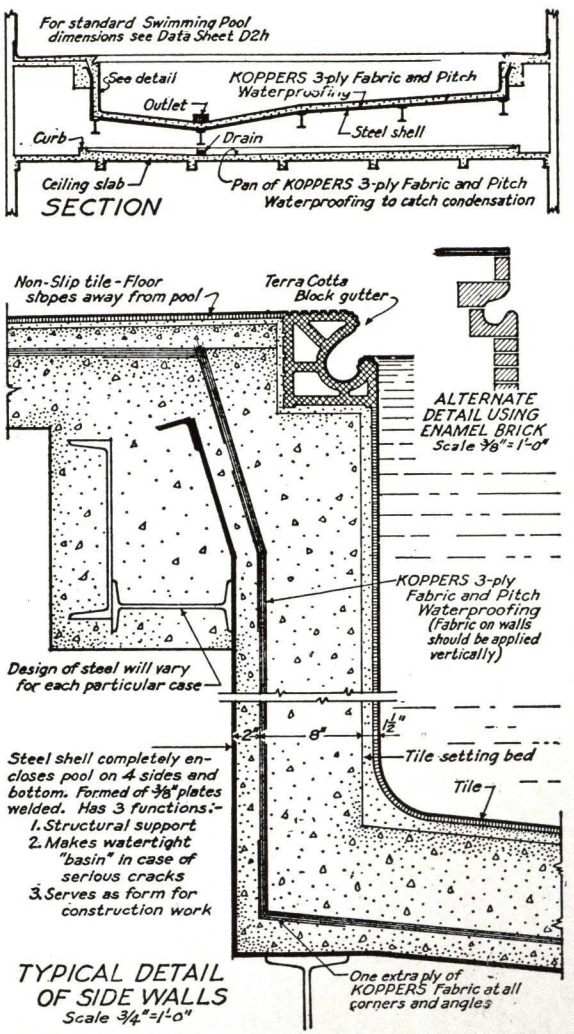
PENCIL POINTS DATA SHEETS

INDOOR SWIMMING POOL

Prepared by Don Graf, B.S., M.Arch.

Sheet No. **D2**

KOPPERS COMPANY. PITTSBURGH



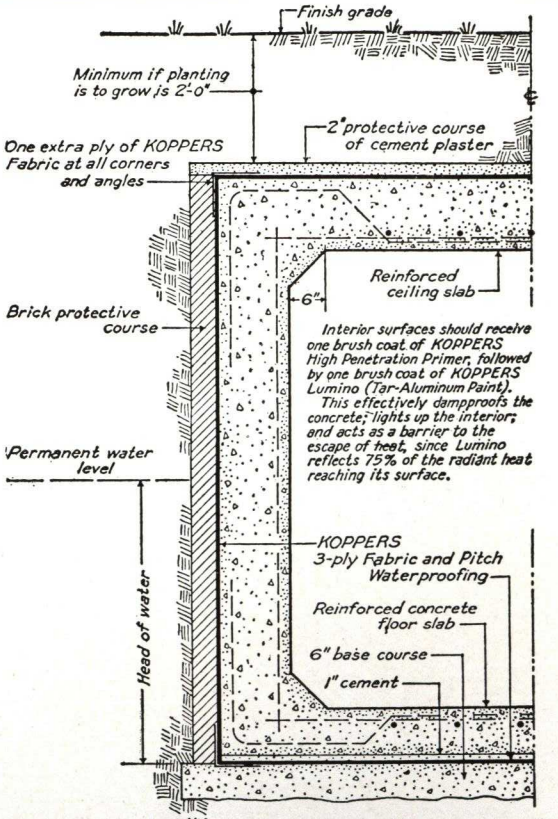
PENCIL POINTS DATA SHEETS

SUBTERRANEAN TUNNEL TO CONNECT BUILDINGS

Prepared by Don Graf, B.S., M.Arch.

Sheet No. **F9**

KOPPERS COMPANY PITTSBURGH



Frequently it is necessary to construct subterranean tunnels from one building to another, either for a passageway for circulation of people, or as a conduit to contain pipes and ducts. If the soil will retain ground water, or if the passage extends below the permanent water level, an effective waterproofing is necessary as shown above. This forms an unbroken envelope through which moisture is unable to penetrate.

The thickness of the floor slab and the reinforcing will depend upon the span and the head of water to be resisted. The thickness and reinforcing of the walls depend upon the height and the water head. The detail of the roof or ceiling slab will depend upon the span and the weight of earth to be sustained.

OTHER KOPPERS PRODUCTS

ROAD MATERIALS

Koppers Tarmac—
For construction, maintenance and repair of highways, streets, private driveways, plant roads, pavements, playgrounds, etc.

WOOD PRESERVATIVES

Koppers Coal Tar Creosote
Koppers Creosote-Coal Tar Solutions
Koppers Anthracene Oils
Koppers Kolineum
Koppers Shingle Stain Oils

PITCH COKE

A low ash carbon for the chemical and metallurgical industries

CRUDE NAPHTHALENE

Standard 74°, 76° and 78° grades

CRUDE TARS

Coke Oven Tar
Horizontal Retort Tar
Vertical Retort Tar
Water Gas Tar

REFINED TARS

Mold Wash Tar
Fish Net Tar
Pipe Dip
Saturating Tar

TAR ACIDS AND TAR ACID OILS

Phenol (82% and 90%)
Cresol (U. S. P., 3° Meta-Para Resin and plasticizer grades)
Cresylic Acid (Disintectant and insecticide grades)
Tar Acid Oils (15-25-35%)
Flotation Oils

LIGHT OILS

Benzol
Toluol
Xylol
Solvent Naphtha

AGRICULTURAL PRODUCT

Tree Spray Oil

BITUMINOUS PAINTS

Koppax Black Paints
Lumino Aluminum Paint
Heat Resisting Paints
Acid-Proof Paints
Paint Base Tars and Pitches

PRESSURE-TREATED WOOD

Treated Joists
Treated Sills
Treated Posts
Treated Sub-Flooring
Treated Structural Lumber
Treated Roof Stringers
Treated Poles
Treated Piling
Treated Foundation Timbers

Also all other types of treated wood, including ties, guard rails, posts, culverts, bridge material, etc.

KOPPERS COMPANY

Tar and Chemical Division

PITTSBURGH, PENNSYLVANIA

SALES OFFICES

NEW YORK, N. Y., Koppers Building, Harrison Turnpike, Kearny, N. J.
PROVIDENCE, R. I., Industrial Trust Building
CHICAGO, ILL., 39th Street and 52nd Avenue, Cicero, Ill.
WOODWARD, ALA. (Phone and Wire—Birmingham, Ala.)
PITTSBURGH, PA., Koppers Building

PLANTS

BUFFALO, N. Y.
CARROLLVILLE, WIS.
CICERO, ILL.
EVERETT, MASS.
FOLLANSBEE, W. VA
HAMILTON, OHIO
KEARNY, N. J.
NEW HAVEN, CONN.
PROVIDENCE, R. I.
ST. LOUIS, MO.
ST. PAUL, MINN.
SWEDELAND, PA.
UTICA, N. Y.
WOODWARD, ALA.
YOUNGSTOWN, OHIO

RU-BER-OID

BUILT-UP ROOFS

6
9

A half century of RU-BER-OID

SINCE 1892, when The Ruberoid Co. pioneered in the production of prepared-ready-to-lay roofing, the growth of the company, the use and number of its products, has been constant and has kept pace with the growth of the United States. Ruberoid products are found all over the world — East and West — at the equator and touching the Arctic Circle.

Ruberoid Built-up Roofing materials are made under the constant supervision of Ruberoid engineers who are experts. The formulae used in these materials have been developed over a long period of years and are the result of a vast amount of research and tests under actual conditions which roofs must meet.

Ruberoid specifications comprising all types of built-up roofs enable architects to specify the type of roof best adapted to construction and climatic conditions. Ruberoid Bonded Built-up Roofs provide for the architect, builder and owner, a guarantee for 10, 15 or 20 years, according to the specifications used. Ruberoid Bonded Roofs are applied only by approved roofing contractors and the guarantee is backed by a National Surety Bond.

There are four popular types of built-up roofing used for roof construction; Asbestos Felt and Asphalt, Coal Tar Pitch and Tarred Felt, Asphalt Felt and Asphalt and combination roofs consisting of Asphalt Felt, Asphalt-saturated Asbestos Felt and Roofing Asphalt.

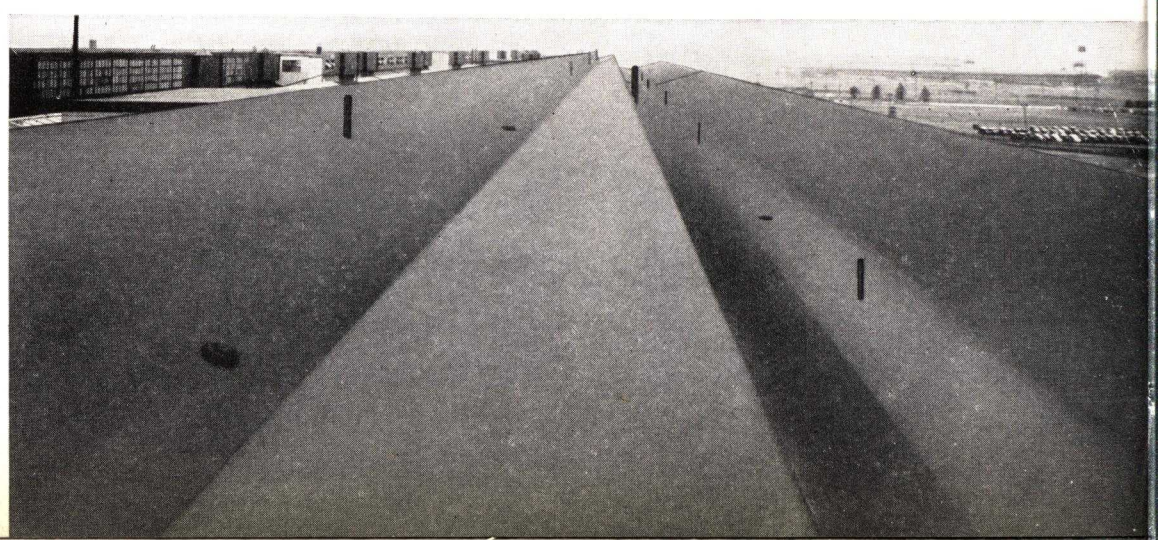
Climatic conditions, the pitch of the roof, proximity to fire hazards, construction of the roof deck and many other factors will determine what type of roof is selected. We can supply the materials for each of the four types of roofs, with specifications to meet any conditions.

On the opposite page are listed many of the Ruberoid Built-up Roofing Materials.

Tabulated on page 4 of this catalog is a chart, showing the specifications generally used for various types of roofs — the guarantees applying and other essential information.

On pages 5 to 11 are Ruberoid Specifications, covering each of the four principal types of roofs.

If you wish further information or have any unusual roofing problems, there is an efficient engineering department located at each of our district offices, ready to give you the benefit of their experience and to help you meet special conditions.



BUILT-UP ROOFING MATERIALS

ASPHALT FELTS — No. 151

Consist of rag felts saturated with waterproofing asphalt. Rolls in No. 12, 14, 15, 20, 24, 30 and 40 lb. weights. Weights indicate lbs. per 100 sq. ft. average weight. Roll content varies from 432 to 108 sq. ft. All weights except No. 12 carry Underwriters' Label.

TARRED FELTS — No. 152

Consist of rag felts saturated with Coal Tar. Furnished in No. 12, 14, 15, and 24 lb. weights in rolls containing from 432 to 216 sq. ft. Weights indicate lbs. per 100 sq. ft. All weights except No. 12 carry Underwriters' Label.

ASBESCOAT No. 60 Asbestos Base Sheet — No. 157

A heavy asbestos felt impregnated and coated on both sides with waterproofing asphalt and sanded with fine silica sand. Weight: 55 lbs. per 108 sq. ft. roll, 32 in. wide.

ASBESTOS FELTS — No. 158

Consist of felts made of asbestos fibres impregnated with waterproofing asphalt. Furnished as follows: Nos. 15, 20, 35 in 32 in. wide rolls. Nos. 15 and 20 contain 324 sq. ft. per roll. No. 35: 216 sq. ft. No. 15, also available in 4 in. wide rolls containing 121½ lin. ft. No. 20 has an additional coating of asphalt on one side.

COAL TAR PITCH — No. 155

Light Cooperage: 375 to 425 lbs. Heavy Cooperage: 625 to 675 lbs. Metal Containers: 500 lbs. Steel Drums: 475 lbs. Sm. light wood barrel—300 to 350 lbs. Large light wood barrel: 475 lbs. Wood barrels and metal drums: 400 lbs.

ASBESTOS COMBINATION FLASHING — No. 161

3-ply combination, consisting of one asphalt saturated fabric cemented between two asphalt impregnated asbestos felts. A very flexible flashing material having unusual strength due to the fabric insertion. No. 29—16 in. wide, No. 58—32 in. wide. 29 and 58 lbs. per 50 ft. 6 in. wide roll.

ASPHALT PRIMER — No. 154

A light penetrating asphalt coating for non-combustible decks and walls. Available in 60 and 30 gal. drums. Weight, approximately 7½ lbs. per gallon.

COAL TAR (Refined) — No. 156

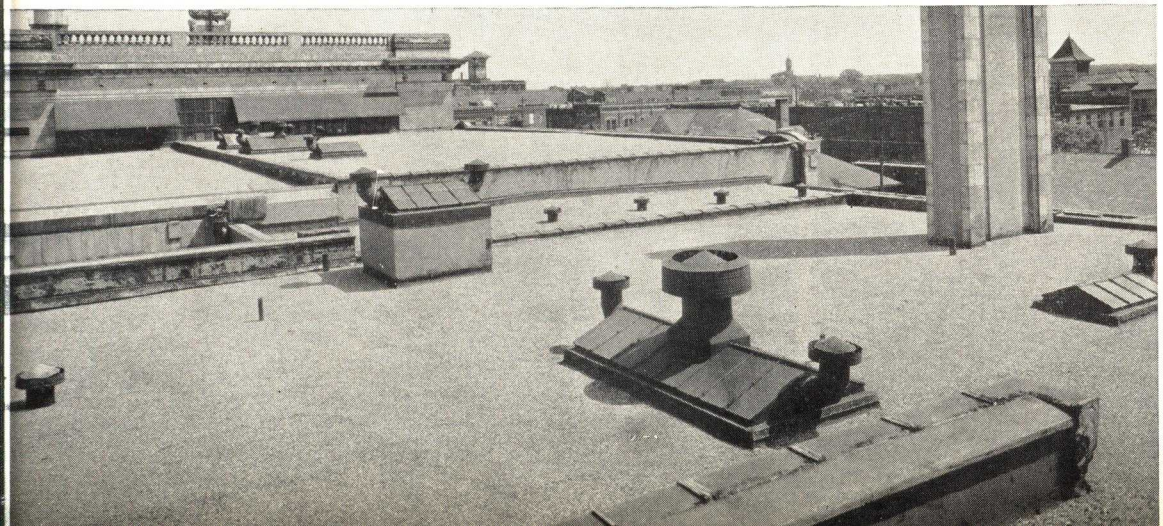
For use as a general preservative, underground and under water. Furnished in wood or metal barrels containing 50 gal. Weight: approximately 550 lbs.

TAR SATURATED ASBESTOS FELT — No. 159

Consists of asbestos felt saturated with coal tar. Used in construction of Asbestos Built-up Roofs. No. 15 lb.: 32 in., 324 sq. ft. per 45 lb. roll.

ROOFING ASPHALT — No. 153

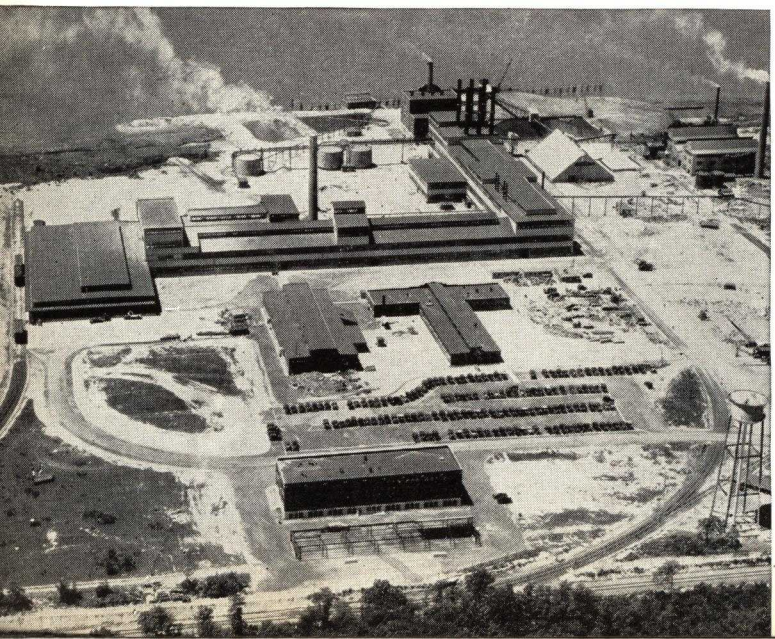
99-9/10% pure petroleum asphalt having a high rating in tests for ductility (stretch) and viscosity (adherence). Used in connection with built-up roofs as the cementing layer between the felts and for top-coating over the roof when all the felts have been laid. Furnished in 150 to 160° melting point for flat roofs and 180 to 190° melting point for steep roofs. Put up in metal drums weighing approximately 475 lbs. per drum and 410 lb. metal drums.



6/9 SUMMARY OF SPECIFICATIONS OF BUILT-UP ROOFS

TYPE No.	DESCRIPTION
1	Tar saturated Rag Felt and Coal Tar Pitch, Slag or Gravel Finish.
2	Asphalt saturated Rag Felt and Roofing Asphalt, Slag or Gravel Finish. Also Mineral-surfaced Finish.
3	Asbestos Felt Built-up Roofs, Asphalt saturated Asbestos Felts and Bond Roofing Asphalt, Smooth Finish.
4	Combination Asphalt and Asbestos Felts. Asphalt saturated Rag Felt, Asphalt saturated Asbestos Felt and Bond Roofing Asphalt, Smooth Finish.

Type No.	Specification No.	Designation	Construction of Deck	Limitation of Roof Pitch (Inches)	Surface Finish	Type of Roofing Felt Involved	Underwriters' Lab. Inc. Rating	Number of Plies of Felt	No. of Lbs. Pitch or Asphalt	Total Weight Per Square		Term or Guaranty Bonded Yrs.
										Gravel Surfaced	Surfaced Slag	
1	151	Pitch and Felt	Wood	2	Slag or Gravel	Tarred Rag Felt	A	One Layer Sheathing Paper, Four Plies No. 15 Tarred Felt	125	596	496	15
1	152	Pitch and Felt	Concrete	1	Slag or Gravel	Tarred Rag Felt	A	Three Plies No. 15 Tarred Felt	175	625	525	15
1	202	Pitch and Felt	Wood	2	Slag or Gravel	Tarred Rag Felt	A	One Layer Sheathing Paper, Five Plies No. 15 Tarred Felt	150	637	537	20
1	203	Pitch and Felt	Concrete	1	Slag or Gravel	Tarred Rag Felt	A	Four Plies No. 15 Tarred Felt	200	665	565	20
2	102	Asphalt Felt	Wood	Over 3	Mineral	Asphalt Felt	C	Two No. 15 Asphalt Felt, Two Ruberoid Dubl-Coverage Roofing	50	Min.	194	10
2	103	Asphalt Felt	Concrete	3 to 6	Mineral	Asphalt Felt	C	Ruberoid Concrete Primer, One No. 15 Asbestos Felt, Two Ruberoid Dubl-Coverage Roofing	80	Min.	218	10
2	153	Asphalt Felt	Wood	½ to 3	Slag or Gravel	Asphalt Felt	A	Four No. 15 Felts	100	566	466	15
2	154	Asphalt Felt	Concrete	½ to 3	Slag or Gravel	Asphalt Felt	A	Three No. 15 Felts	125	585	485	15
2	204	Asphalt Felt	Wood	½ to 3	Slag or Gravel	Asphalt Felt	A	Five No. 15 Felts	125	607	507	20
2	205	Asphalt Felt	Concrete	½ to 3	Slag or Gravel	Asphalt Felt	A	Four No. 15 Felts	150	625	525	20
3	150	Asbestos	Wood	½ to 6	Smooth	Asbestos	A	One No. 60 Asbestos, Two No. 20 Asbestos	75	Smooth	172	15
3	200	Asbestos	Wood	½ to 6	Smooth	Asbestos	A	One No. 60 Asbestos, Two No. 20 Asbestos	75	Smooth	172	20
3	201	Asbestos	Concrete	½ to 6	Smooth	Asbestos	A	One No. 60 Asbestos, Two No. 20 Asbestos	110	Smooth	215	20
4	100	Combination	Wood	½ to 6	Smooth	Rag & Asbestos	C	One No. 30 Rag Felt, Two No. 20 Asbestos	75	Smooth	149	10
4	101	Combination	Concrete	½ to 6	Smooth	Rag & Asbestos	A	One No. 30 Rag Felt, Two No. 20 Asbestos	100	Smooth	182	10
4	156	Combination	Wood	½ to 6	Smooth	Rag & Asbestos	C	One No. 40 Rag Felt, Two No. 20 Asbestos	75	Smooth	160	15
4	157	Combination	Concrete	½ to 6	Smooth	Rag & Asbestos	A	Two No. 15 Rag Felt, Two No. 20 Asbestos	130	Smooth	212	15
4	208	Combination	Wood	½ to 6	Smooth	Rag & Asbestos	B	One No. 40 Rag Felt, Three No. 20 Asbestos	95	Smooth	199	20
4	209	Combination	Concrete	½ to 6	Smooth	Rag & Asbestos	A	Two No. 15 Rag Felt, Three No. 20 Asbestos	130	Smooth	232	20



GENERAL SPECIFICATIONS

for

RUBEROID BONDED BUILT-UP ROOFS

Applicable to All Specifications for Ruberoid Built-up Roofs on the Following Pages

DEFINITIONS

Unless otherwise specifically stated in any case, the terms hereunder listed shall be construed in accordance with definitions as follows:

Manufacturer—The RUBEROID Co., whose main office is at 500 Fifth Avenue, New York, N. Y.

Contractor—The Roofing Contractor.

Asphalt Felt—Ruberoid No. 30 and 40 Asphalt Felt. (Exceptions: Specifications No. 157, 209. Use Ruberoid No. 15 Asphalt Felt.)

Asbestos Felt—Ruberoid No. 20 Asphalt-saturated Asbestos Felt.

Asphalt—Ruberoid Roofing Asphalt or Ruberoid Bond Roofing Asphalt.

Tarred Felt—Ruberoid No. 15 Tarred Felt.

Coal Tar Pitch—Ruberoid Coal Tar Pitch.

Asbestos Base Felt—Ruberoid No. 60 Asbestos Base Felt.

Concrete Primer—Ruberoid Concrete Primer.

Asphalt Base Felt—Ruberoid No. 40 Asphalt Felt.

WORK BY OTHERS

Over Board Sheathing: Specifications No. 100, 102, 150, 151, 153, 156, 200, 202, 204 and 208.

The roof deck must be constructed of seasoned lumber, dressed on upper side, dry and free from large cracks and knot holes. Roof boards must be securely nailed in place, leaving no nail heads above the wood surfaces. Surfaces must be properly graded to outlets and cant strips provided in the angle formed between the roof and vertical surfaces.

Over Board Sheathing With or Without Approved Insulation and Precast Gypsum Blocks: Specifications No. 151, 202.

If over boards, the roof deck shall be constructed of seasoned lumber, smooth and securely nailed, and free from large cracks or knot holes. It shall be properly graded to outlets and swept clean and free from all loose material.

Over Poured Concrete, Poured Gypsum, Precast Concrete Tile or Book Tile With or Without Approved Insulation: Specifications No. 101, 103, 152, 154, 157, 201, 203, 205 and 209.

The roof deck shall be thoroughly dry, smooth and free from loose material, and properly graded to outlets.

Where Book Tile is used the surface of the tile shall be covered with portland cement mortar 1-in. thick with a smooth and even finish.

Where poured gypsum or precast gypsum blocks are used, all felt shall be nailed as required when the roof deck is of boards.

For inclines exceeding 3-in. to the foot, if the deck is of concrete, wooden nailing strips must be provided at proper intervals.

Coves shall be provided in the angle formed between the roof and vertical surfaces.

GENERAL REQUIREMENTS APPLYING TO CONTRACTOR

The contractor must be approved by the manufacturer.

The contractor shall inspect the roof surfaces and shall not proceed with roofing work until all defects reasonably apparent by proper inspection and which might injure the roofing, have been remedied by others. The contractor assumes responsibility for existing undersurfaces as to their fitness to receive roofing when he proceeds with his work.

Roof surfaces shall be swept clean and free of all loose material before proceeding with roofing work.

The contractor shall afford all necessary facilities for inspections by the manufacturer.

GENERAL NOTES

Note 1—Insulated Roofs—If this roof is to be applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing and of a type that will retain nails.

No more insulation shall be laid at one time than can be promptly protected by roofing in the event of sudden weather changes. A felt cut-off shall be mopped along the edge of the insulation at a distance not greater than one width of insulating material from walls, curbs and other openings.

Note 2—Leader Heads, Vents, etc.—Leader heads, vents and other openings shall be furnished with metal flanges of sufficient width to permit proper connections with the roofing. If not so furnished an exception of responsibility will be taken for any leaks which may develop immediately adjacent. Flanges of scuppers, gutters, gravel guards, finishing or edging strips, leader heads and vents shall be set on top of all felts, nailed and double felt stripped.

BONDS

The Manufacturer's Surety Bond Guaranty as issued by the National Surety Corp. of New York, N. Y., covering a period of *. . . 10, 15, or 20 years, depending upon the specification used . . .* from date of completion of the work shall be furnished.

Note: This guarantee is not given on jobs of less than 50 squares, nor in such portions of the United States as are not covered by the Manufacturer's Inspection Service, except by special arrangement with the Manufacturer.

ASBESTOS FELT AND ASPHALT FELT, SMOOTH FINISH ROOF

For Use Over Board Sheathing

For Inclines Not Exceeding 6-in. per Ft. (Not to Be Used on True Level Decks)

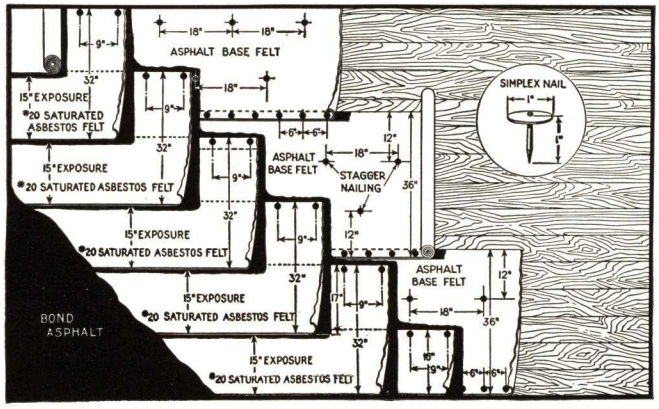
SPECIFICATION No. 100 (COMBINATION) — 10-YEAR BOND*

Underwriters' Laboratories Class C Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 10-year Guaranty Bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Lay one ply of No. 30 Asphalt Felt, lapping sheets 2-in. at edges and not less than 6-in. at end laps. Nail at 6-in. intervals



along lap and at 18-in. intervals along lines 12-in. from each edge of each sheet, the latter nails being staggered. This felt shall be turned up not less than 4-in. along all walls and vertical surfaces.

Second—Over entire surface lay two plies of No. 20 Saturated Asbestos Felt, embedding each sheet in Asphalt, lapping each sheet 17-in. over preceding one and rolling each sheet immediately behind the mop to insure proper adhesion of all sheets. In no place shall felt touch felt. Each sheet shall be nailed along back edge only from 1-in. to 1½-in. down, at intervals of approximately 18 in. These felts shall be cut off at angle of roof deck and all vertical surfaces.

Third—Over entire surface mop a uniform coating of Asphalt, using not more than 20 lb. per 100 sq. ft.

Total Approximate Weight, 100 sq. ft.....149 lbs.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly embedded by brooming felt. Asphalt shall not be heated to exceed 450° F.

All nailing of roofing to board surfaces shall be done with Simplex flat head roofing nails or with ⅞-inch galvanized roofing nails, driven through flat tin discs.

All roofing work shall be done to the satisfaction and approval of the manufacturer.

SPECIFICATION No. 101 (COMBINATION) — 10-YEAR BOND*

For Use Over Poured Concrete, Poured Gypsum, Gypsum Block, Precast Concrete Tile, Book Tile or Approved Insulation

For Incline Not Exceeding 6-in. per Ft. (Not to be Used on True Level Decks)

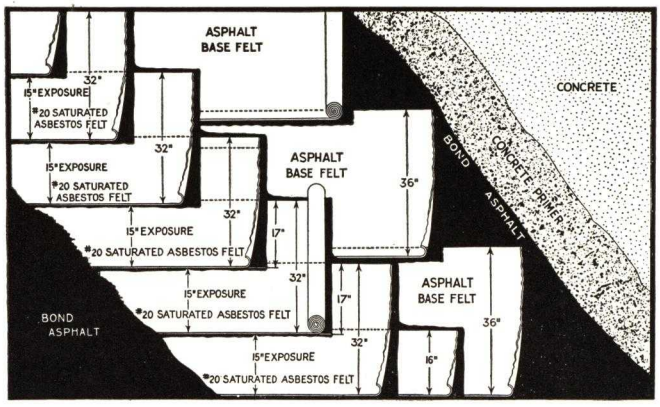
Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 10-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Coat entire surface with Primer applied cold, allowing same to dry thoroughly. Where plastic material is used to caulk joints of blocks, coating of primer shall be held back 2-in. from all joints.

Second—Over entire surface lay one ply of No. 30 Asphalt Felt in Roofing Asphalt, lapping each sheet 2-in. over preceding one at edges and not less than 6-in. at end laps. Roll each sheet immediately behind mop to insure proper adhesion of all sheets. Mopping



and rolling shall be so done as to secure a continuous bed of asphalt of uniform thickness. In no place shall felt touch felt or roof deck. Felts shall be cut off at angle of roof deck and all vertical surfaces.

On inclines exceeding 3-in. to the foot these sheets shall be nailed at intervals of 9-in. along the lap into the nailing strips.

Note: Where poured gypsum or precast gypsum blocks are used, all three plies of felt shall be nailed as specified for board decks.

Third—Over entire surface lay in asphalt two plies of No. 20 Saturated Asbestos Felt, lapping each sheet 17-in. over preceding one, rolling each sheet immediately behind mop to insure a uniform coating of hot asphalt. In no place shall felt touch felt.

On inclines exceeding 3-in. to the foot, sheets shall be nailed at intervals of 18-in. along the nailing strips or back edge.

These felts shall be cut off at angle of roof deck and vertical surfaces.

Fourth—Over entire surface mop a uniform coating of asphalt, using not more than 20 lb. per 100 sq. ft.

Total Approximate Weight 100 sq. ft.....182 lbs.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind hot mop and firmly embedded by brooming the felt. Asphalt shall not be heated to exceed 450° F.

All nailing of roofing shall be done with Simplex flat head roofing nails or with ⅞-inch galvanized roofing nails, driven through flat tin discs.

All roofing work shall be done to the satisfaction and approval of the manufacturer.

*For general specification see page 5.

COAL TAR PITCH AND TARRED FELT, GRAVEL OR SLAG FINISH ROOF

For Use Over Board Sheathing With or Without Approved Insulation and Precast Gypsum Blocks

For Inclines Not Exceeding 2-In. per Ft.

SPECIFICATION No. 151 — 15-YEAR BOND*

Underwriters' Laboratories Class A Rating

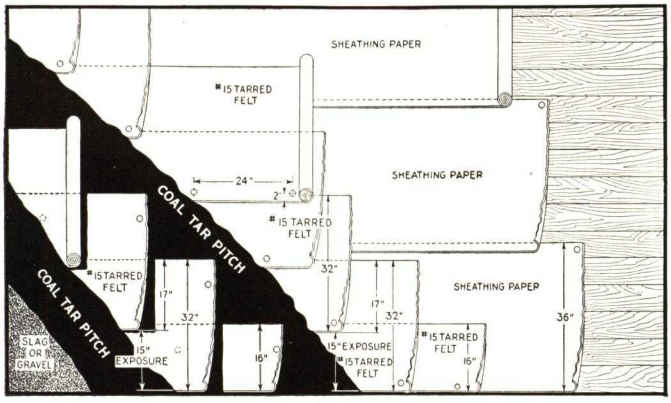
The roofing shall be a Ruberoid Bonded Roof carrying a 15-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Lay one thickness of sheathing paper, weighing not less than 5 lb. per 100 sq. ft., lapping sheets at least 1-in. If Precast Gypsum Block is used, sheathing paper may be omitted.

Second—Over entire surface lay two plies of No. 15 Tarred Felt, lapping each sheet 17-in. over preceding one, and turning up these felts not less than 4-in. along all vertical surfaces. Nail as often as is necessary to secure, until remaining felt is laid.

Third—Coat entire surface uniformly with Coal Tar Pitch.



Fourth—Over entire surface lay two plies of No. 15 Tarred Felt, lapping each sheet 17-in. over preceding one, mopping with Coal Tar Pitch full 17-in. on each sheet, so that in no place shall felt touch felt. Back edge of each sheet shall be nailed at intervals of 24-in. at a distance not greater than 6-in. from back edge of sheet. Such nailing as is necessary shall be done so that all nails are covered by not less than one ply of felt. Felts shall be cut off at angle of roof deck and walls or vertical surfaces.

Fifth—Over entire surface pour a uniform coating of Coal Tar Pitch into which, while hot, embed not less than 400 lb. of gravel or 300 lb. of slag for each 100 sq. ft. Gravel or slag shall be ¼-in. to ⅝-in. in size, dry and free from dirt. If roof is applied during cold weather, or slag or gravel is damp, it shall be heated and dried immediately before application.

Total Approximate Weight 100 sq. ft.. { gravel surface ..596 lb. / slag surface ....496 lb.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles. Pitch shall not be heated to exceed 400° F.

All nailing or roofing shall be done with Simplex flat head roofing nails or with ⅞-inch galvanized roofing nails, driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

ASPHALT FELT 36 IN. WIDE AND ASPHALT WITH SLAG OR GRAVEL SURFACE— SPECIFICATION NO. 153

15-Year Bond—Underwriters' Class A Rating—For inclines not exceeding 4-in. per Ft.

No sheathing paper is required.

SPECIFICATION No. 152 — 15-YEAR BOND*

For Use Over Poured Concrete, Poured Gypsum, Precast Concrete Tile or Book Tile With or Without Approved Insulation

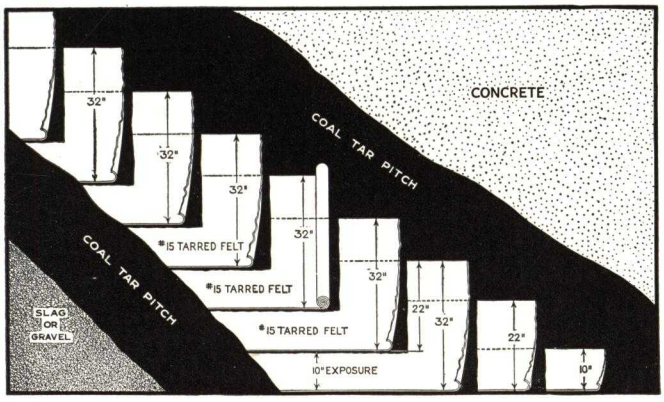
For Inclines Not Exceeding 1-in. per Ft.

Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 15-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Coat deck uniformly with Coal Tar Pitch. If Precast Concrete Tile is used, surface shall be spot or strip mopped.



Second—Over entire surface lay three plies of No. 15 Tarred Felt, lapping each sheet 22-in. over preceding one and mopping with Coal Tar Pitch full 22-in. on each sheet so that in no place shall felt touch felt. Felt shall be cut off at angle of roof deck and walls or vertical surfaces.

Third—Over entire surface pour a uniform coating of Coal Tar Pitch into which, while hot, embed not less than 400 lb. of gravel or 300 lb. of slag for each 100 sq. ft. Gravel or slag shall be from ¼-in. to ⅝-in. in size, dry and free from dirt.

If roof is applied during cold weather, or slag or gravel is damp, it shall be heated and dried immediately before application.

Total Approximate Weight 100 sq. ft.. { gravel surface ..625 lb. / slag surface ....525 lb.

WORKMANSHIP

All felt shall be laid without wrinkles or buckles. Pitch shall not be heated to exceed 400° F.

All roofing shall be done to the satisfaction and approval of the manufacturer.

ASPHALT FELT 36 IN. WIDE AND ASPHALT WITH SLAG OR GRAVEL SURFACE— SPECIFICATION NO. 154

15-Year Bond—Underwriters' Class A Rating—For inclines not exceeding 3-in. per ft.

Concrete primer is used.

*For general specification see page 5.

ASBESTOS FELT AND ASPHALT SMOOTH FINISH ROOF

For Use Over Board Sheathing

For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)

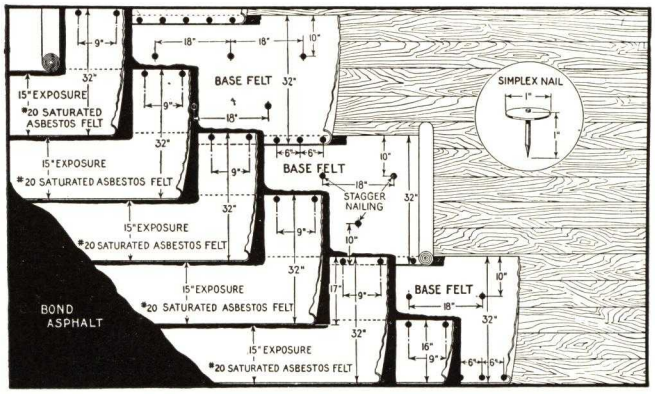
SPECIFICATION No. 200 — 20-YEAR BOND*

Underwriters' Laboratories Class A Rating

The roofing shall be Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Lay one ply of No. 60 Saturated Asbestos Base-Felt, lapping each sheet 2-in. at edges and not less than 6-in. at end laps. Nail at 6-in. intervals along lap, and also at intervals of 18-in. on a line 10-in. from each edge of sheet, staggering the nails. Felt shall be turned up not less than 4-in. along all vertical surfaces.



Second—Over entire surface embed in Asphalt two plies of No. 20 Saturated Asbestos Felt, lapping each sheet 17-in. over preceding one, rolling each sheet immediately behind mop to insure a uniform coating of hot Asphalt so that in no place shall felt touch felt. Each sheet shall be nailed along the back edge from 1 to 1½-in. down at intervals of approximately 18-in. These felts shall be cut off at angle of roof deck and walls or vertical surfaces.

Third—Over entire surface mop a uniform coating of Asphalt using not more than 20 lb. per 100 sq. ft.

Total Approximate Weight per 100 sq. ft.....172 lb.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly embedded by brooming the felt. The Asphalt shall not be heated to exceed 450° F.

All nailing of roofing to board surfaces shall be done with Simplex flat head roofing nails or with ⅞-inch galvanized roofing nails driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

SPECIFICATION No. 201 — 20-YEAR BOND*

For Use Over Poured Concrete, Poured Gypsum, Gypsum Block, Precast Concrete Tile, Book Tile or Approved Insulation

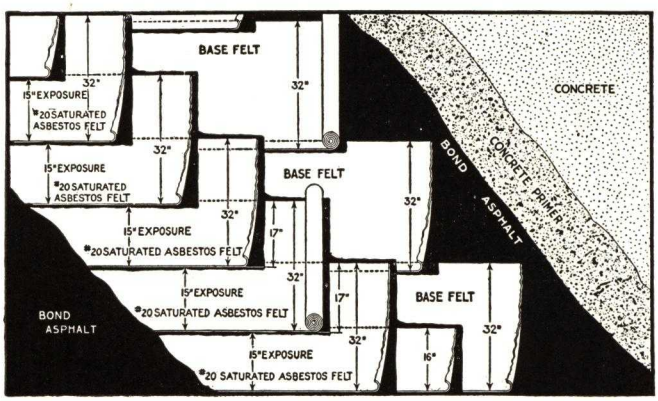
For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)
Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Coat entire surface with Concrete Primer applied cold and allow same to dry thoroughly. Where plastic material is used to caulk joints of blocks, coating of primer shall be held back 2-in. from all joints.

Second—Over entire surface embed in Ruberoid Bond Asphalt one ply of No. 60 Asbestos Base-Felt, lapping each sheet 2-in. over preceding one at edges and not less than 6-in. at end laps. Nail at intervals of 12-in. along laps into nailing strip. All felts shall be cut off at angle of roof deck and all walls or vertical surfaces.



Third—Over entire surface embed in Ruberoid Bond Asphalt two plies of No. 20 Asphalt-saturated Asbestos Felt, lapping each sheet 17-in. over preceding one, rolling each sheet immediately behind mop to insure a uniform coating of hot asphalt so that in no place shall felt touch felt.

On inclines exceeding 3-in. to the foot, these sheets shall be nailed 6-in. from back edge at intervals of 24-in. All felts shall be cut off at angle of roof deck and all walls or vertical surfaces.

Fourth—Over entire surface mop a uniform coating of Asphalt, using not more than 20 lb. per 100 sq. ft.

Total Approximate Weight per 100 sq. ft. .....215 lb.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly embedded by brooming the felt.

All nailing of roofing to roof surfaces shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails, driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

*For general specification see page 5.

COAL TAR PITCH AND TARRED FELT, GRAVEL OR SLAG FINISH ROOF

For Use Over Board Sheathing With or Without Approved Insulation and Precast Gypsum Blocks

For Inclines Not Exceeding 2-In. per Ft.

SPECIFICATION No. 202 — 20-YEAR BOND*

Underwriters' Laboratories Class A Rating

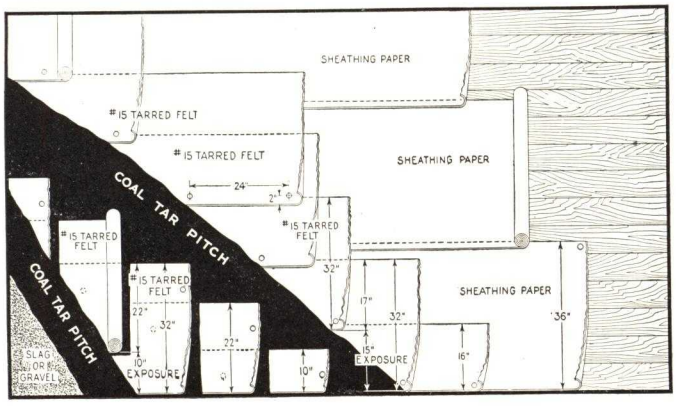
The roofing shall be a Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Lay one thickness of sheathing paper, weighing not less than 5 lb. per 100 sq. ft., lapping the sheets at least 1-in. If Precast Gypsum Block is used, sheathing paper may be omitted.

Second—Over entire surface lay two plies of No. 15 Tarred Felt, lapping each sheet 17-in. over preceding one and nailing enough to secure, until remaining felt is laid. These felts shall be turned up not less than 4-in. along all walls or vertical surfaces.

Third—Coat entire surface uniformly with Coal Tar Pitch.



Fourth—Over entire surface lay three plies of No. 15 Tarred Felt, lapping each sheet 22-in. over preceding one, mopping with Coal Tar Pitch the full 22-in. on each sheet, so that in no place shall felt touch felt. The back edge of sheet shall be nailed at intervals of 24-in. at a distance not greater than 6-in. from back edge of sheet. Necessary nailing shall be done so that all nails are covered by not less than two plies of felt. These felts shall be cut off at angle of roof deck and walls or vertical surfaces.

Fifth—Over entire surface pour a uniform coating of Coal Tar Pitch into which, while hot, embed not less than 400 lb. of gravel or 300 lb. of slag for each 100 sq. ft. Gravel or slag shall be ¼-in. to ⅝-in. in size, dry and free from dirt. If roof is applied during cold weather, or slag or gravel is damp, it shall be heated and dried immediately before application.

Approximate Weight per 100 sq. ft.....{ gravel surface ..637 lb. / slag surface ....537 lb.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles, and pitch shall not be heated to exceed 400° F.

All nailing of roofing shall be done with Simplex flat head roofing nails or with ⅞-inch galvanized roofing nails, driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

ASPHALT FELT 36 IN. WIDE AND ASPHALT WITH SLAG OR GRAVEL SURFACE— SPECIFICATION NO. 204

20-Year Bond-Underwriters' Class A Rating—For inclines not exceeding 3-in. per ft.

No sheathing paper is required.

SPECIFICATION No. 203 — 20-YEAR BOND*

For Use Over Poured Concrete, Poured Gypsum, Precast Concrete Tile or Book Tile With or Without Approved Insulation

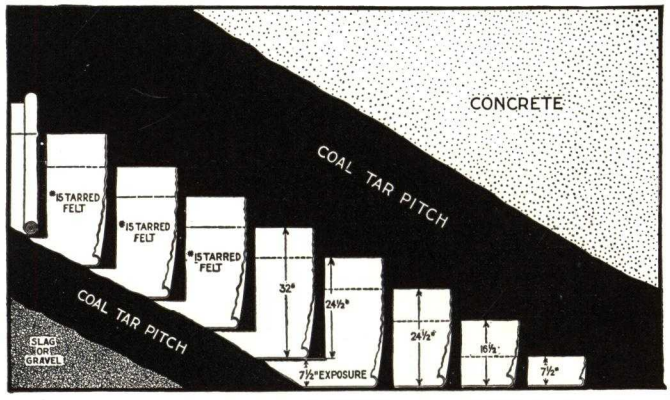
For Inclines Not Exceeding 1-In. per Ft.

Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Coat roof deck uniformly with Coal Tar Pitch. If Precast Concrete Tile is used, surface shall be spot or strip mopped.



Second—Over entire surface lay four plies of No. 15 Tarred Felt, lapping each sheet 24½-in. over the preceding one and mopping with Coal Tar Pitch the full 24½-in. on each sheet, so that in no place shall felt touch felt. These felts shall be cut off at angle of roof deck and walls or vertical surfaces.

Third—Over entire surface pour a uniform coating of Coal Tar Pitch into which, while hot, embed not less than 400 lb. of gravel or 300 lb. of slag for each 100 sq. ft. Gravel or slag shall be from ¼-in. to ⅝-in. in size, dry and free from dirt. If roof is applied during cold weather, or slag or gravel is damp, it shall be heated and dried immediately before application.

Approximate Weight per 100 sq. ft.....{ gravel surface ..665 lb. / slag surface ....565 lb.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles, and pitch shall not be heated to exceed 400° F.

All roofing shall be done to the satisfaction and approval of the manufacturer.

ASPHALT FELT 36 IN. WIDE AND ASPHALT WITH SLAG OR GRAVEL SURFACE— SPECIFICATION NO. 205

20-Year Bond-Underwriters' Class A Rating—For inclines not exceeding 3-in. per ft.

Concrete primer is used.

*For general specification see page 5.

ASBESTOS FELT AND ASPHALT FELT, SMOOTH FINISH ROOF

For Use Over Board Sheathing

For Inclines Not Exceeding 6-in. per Ft. (Not to Be Used on True Level Decks)

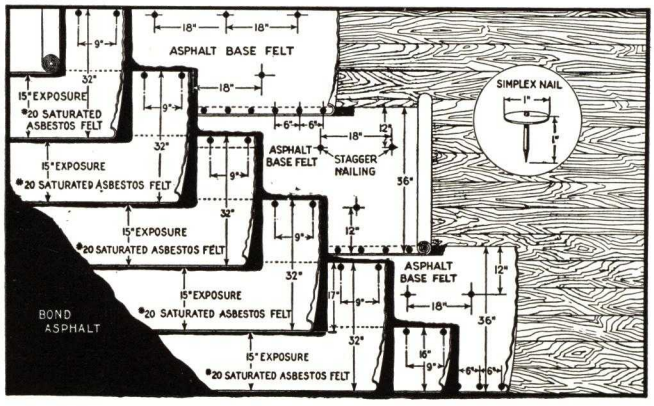
SPECIFICATION No. 156 (COMBINATION) — 15-YEAR BOND*

Underwriters' Laboratories Class C Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 15 year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Lay one ply of No. 40 Asphalt Base Felt, lapping each sheet 2-in. at edges and not less than 6-in. at end laps. Nail at 6-in. intervals along lap and also at intervals of 18-in. on a line 12-in. from each edge of sheet, staggering the nails. This felt shall be turned up not less than 4-in. along all walls and vertical surfaces.



Second—Over entire surface embed in Ruberoid Bond Asphalt two plies of No. 20 Asphalt-Saturated Asbestos Felt lapping each ply 17-in. over preceding one and rolling each ply immediately behind mop to insure a uniform coating of hot asphalt so that in no place shall felt touch felt. Each ply shall be nailed along back edge at intervals of approximately 18-in. These felts shall be cut off at angle of roof deck and all walls or vertical surfaces.

Third—Over entire surface mop a uniform coating of Asphalt, using not more than 20 lbs. per 100 sq. ft.

Total approximate weight, 100 sq. ft. .....149 lbs.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind hot mop and firmly embedded by brooming the felt. Asphalt shall not be heated to exceed 450° F.

All nailing of roofing to board surfaces shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

SPECIFICATION No. 157 (COMBINATION) — 15-YEAR BOND*

For Use Over Poured Concrete, Poured Gypsum, Gypsum Block, Precast Concrete Tile, Book Tile or Approved Insulation

For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)

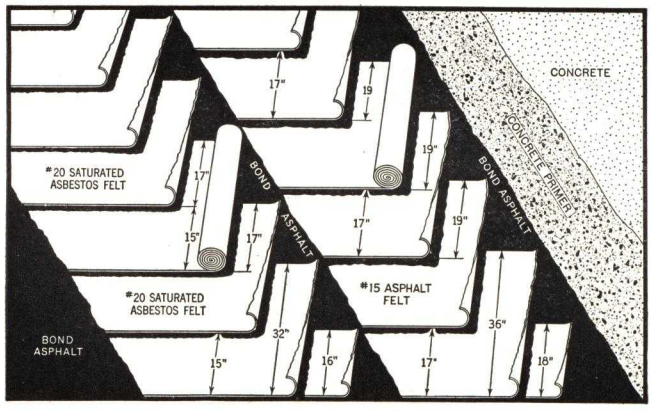
Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 15-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Coat entire surface with Primer applied cold, allowing same to dry thoroughly. Where plastic material is used to caulk joints of blocks, coating of primer shall be held back 2-in. from all joints.

Second—Over entire surface lay two plies of No. 15 Asphalt Felt in Ruberoid Bond Roofing Asphalt, lapping each ply 19-in. over preceding one and rolling each ply immediately behind mop to insure proper adhesion of all sheets. In no place shall felt touch felt. Felts shall be cut off at top of cove in angle of roof deck and all vertical surfaces.



On inclines exceeding 3-in. to the foot these sheets shall be nailed at intervals of 18-in. along back edge into the nailing strips.

Note: Where poured gypsum or precast gypsum blocks are used, all felt shall be nailed as specified for board decks.

Third—Over entire surface lay in asphalt two plies of No. 20 Asphalt-saturated Asbestos Felt, lapping each ply 17-in. over preceding one, rolling each ply immediately behind mop to insure a uniform coating of hot asphalt. In no place shall felt touch felt.

On inclines exceeding 3-in. to the foot, plies shall be nailed at intervals of 18-in. along back edge into the nailing strips.

The felt shall be cut off at angle of roof deck and vertical surfaces.

Fourth—Over entire surface mop a uniform coating of asphalt, using not more than 20 lbs. per 100 sq. ft.

Total Approximate Weight per 100 sq. ft. .....212 lbs.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly imbedded by brooming the felt. Asphalt shall not be heated to exceed 450° F.

All nailing of roofing to roof surfaces shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

*For general specification see page 5.

ASBESTOS FELT AND ASPHALT FELT, SMOOTH FINISH ROOF

For Use Over Board Sheathing

For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)

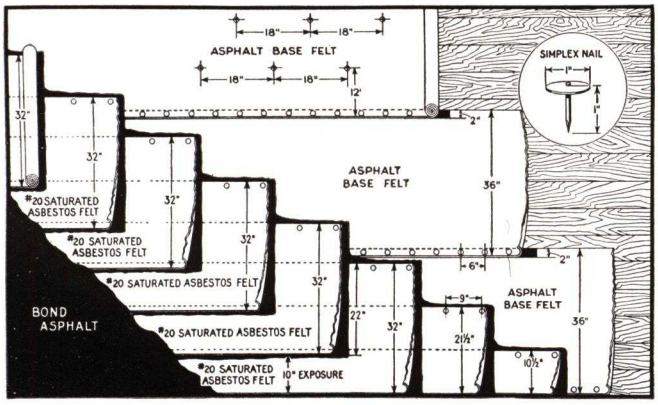
SPECIFICATION No. 208 (COMBINATION) — 20-YEAR BOND*

Underwriters' Laboratories Class B Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Lay one ply of No. 40 Saturated Asphalt Base Felt, lapping each sheet 2-in. and not less than 6-in. at end laps. Nail at 6-in. intervals along the lap. This felt shall be turned up not less than 4-in. along all vertical surfaces.



Second—Over this No. 40 Asphalt Base Felt embed in Ruberoid Bond Asphalt three plies of No. 20 Saturated Asbestos Felt, lapping each sheet 22-in. over preceding one, rolling each sheet immediately behind mop to insure a uniform coating of hot Ruberoid Bond Asphalt so that in no place shall felt touch felt. Each sheet shall be nailed along back edge from 1 to 1½-in. down at intervals of approximately 18-in. These felts shall be cut off at angle of roof deck and walls or vertical surfaces.

Third—Over entire surface mop a uniform coating of Asphalt, using not more than 20 lbs. per 100 sq. ft.

Total approximate weight per 100 sq. ft. .....199 lbs.

WORKMANSHIP

Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly embedded by brooming the felt. The Asphalt shall not be heated to exceed 450° F.

All nailing of roofing to board surfaces shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

SPECIFICATION No. 209 (COMBINATION) — 20-YEAR BOND*

For Use Over Poured Concrete, Poured Gypsum, Gypsum Block, Precast Concrete Tile, Book Tile or Approved Insulation

For Inclines Not Exceeding 6-In. per Ft. (Not to Be Used on True Level Decks)

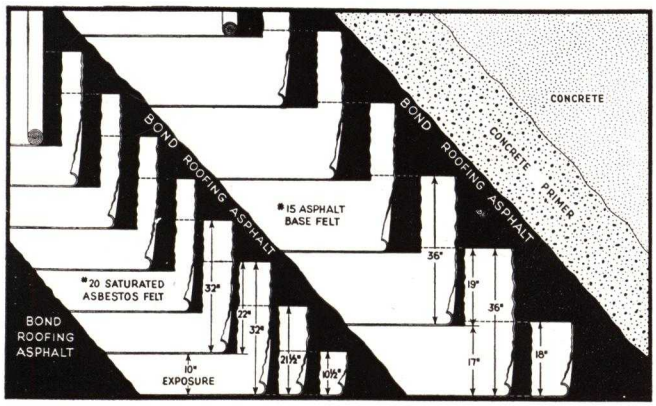
Underwriters' Laboratories Class A Rating

The roofing shall be a Ruberoid Bonded Roof carrying a 20-year guaranty bond, installed in accordance with conditions and specifications as hereinafter set forth.

SPECIFICATIONS FOR LAYING ROOFING

First—Coat entire surface with Primer applied cold, allowing same to dry thoroughly. Where plastic material is used to caulk joints of blocks, coating of primer shall be held back 2-in. from all joints.

Second—Over entire surface lay two plies of No. 15 Asphalt Felt in Roofing Asphalt, lapping each ply 19-in. over preceding one and rolling each ply immediately behind mop to insure proper adhesion of all sheets. In no place shall felt touch felt. Felts shall be cut off at top of cove or angle of roof deck and all vertical surfaces.



On inclines exceeding 3-in. to the foot these sheets shall be nailed at intervals of 18-in. along the back edge into nailing strips.

Third—Over entire surface embed in Ruberoid Bond Asphalt three plies of No. 20 Saturated Asbestos Felt, lapping each sheet 22-in. over preceding one, rolling each sheet immediately behind mop to insure a uniform coating of hot Roofing Bond Asphalt so that in no place shall felt touch felt. Each sheet shall be nailed 6-in. from back edge, at intervals of approximately 18-in. These felts shall be cut off at angle of roof deck and walls or vertical surfaces.

Note: Where poured gypsum or precast gypsum blocks are used, all felt shall be nailed as specified for board decks.

On inclines exceeding 3-in. to the foot, these sheets shall be nailed along back edge at intervals of 24-in.

Fourth—Over entire surface mop a uniform coating of Asphalt, using not more than 20 lbs. per 100 sq. ft.

Total Approximate Weight per 100 sq. ft. .....232 lbs.

WORKMANSHIP

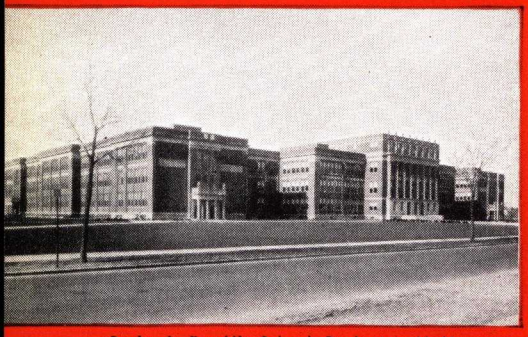
Felt shall be laid without wrinkles or buckles. It shall be rolled immediately behind the hot mop and firmly embedded by brooming the felt. Asphalt shall not be heated to exceed 450° F.

All nailing of roofing to board surfaces shall be done with Simplex flat head roofing nails or with ⅞-in. galvanized roofing nails driven through flat tin discs.

All roofing shall be done to the satisfaction and approval of the manufacturer.

*For general specification see page 5.

New unit of the Home Office Group of the Metropolitan Life Insurance Co., New York, N. Y. Protected with 45,000 square feet RU-BER-OID Built-up Roofing.
Architects—Dan Everett Waid & Harvey Wiley Corbett, N.Y.



Benjamin Franklin School, Rochester, N. Y.
Protected with 140,000 square feet RU-BER-OID Built-up Roofing.
Architect—Gordon and Kaelber, Rochester, N. Y.

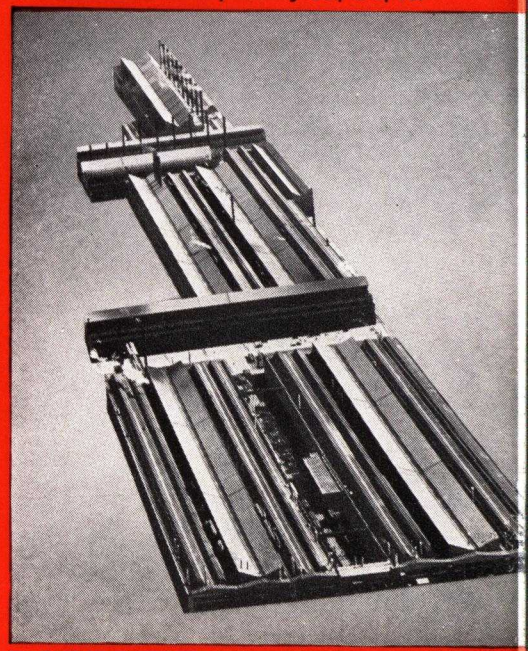
Chicago Merchandise Mart, Chicago, Ill. Protected with 225,000 square feet RU-BER-OID Built-up Roofing
Architects—Graham, Anderson, Probst & White, Chicago, Ill.

Manufacturing and Warehouse Building
Continental Can Company, Houston, Texas. Protected with 50,000 square feet RU-BER-OID Built-up Roofing.
Plans—Company Engineer.

Cleveland Stadium, Cleveland, Ohio.
Protected with 220,000 square feet RU-BER-OID Built-up Roofing.
Architects—Walker & Weeks, Cleveland, Ohio.

Huron Road Hospital, E. Cleveland, Ohio.
Protected with 19,000 square feet RU-BER-OID Built-up Roofing.
Architect--George S. Rider Co., Cleveland, Ohio.

Lawrence Hotel, Erie, Pa.
Protected with 11,200 square feet RU-BER-OID Built-up Roofing.
Roofer—McCreary Roofing Co., Erie, Pa.



The Ford Company Pressed Steel and Spring Upset Buildings at the River Rouge Plant are pictured here. Over 2,000,000 square feet RU-BER-OID Built-up Roofs protect Ford factories. Architect, Albert Kahn, Detroit, Mich.

SECTION 6

CONTINUED →

REILLY TAR & CHEMICAL CORPORATION

Manufacturers of Built-up Roofing and Waterproofing Materials

2513 So. Damen Avenue
CHICAGO, ILL.

Merchants Bank Building
INDIANAPOLIS, IND.

500 Fifth Avenue
NEW YORK, N. Y.

PLANTS

CHICAGO, ILL.
INDIANAPOLIS, IND.
GRANITE CITY, ILL.
NEWARK, N. J.
PROVO, UTAH
MOBILE, ALA.
NORFOLK, VA.
FAIRMONT, W. VA.
SEATTLE, WASH.
CHATTANOOGA, TENN.
DOVER, OHIO
MINNEAPOLIS, MINN.

PRODUCTS

Coal Tar Pitch.
Tarred Felt.
Refined Coal Tar.
Plastic Cement.
Roof Coating.

For Reilly Wood Preservative, see File Index.

"BUILT-UP" ROOFS

Reilly Bonded Tarred Felt and Bonded Pitch are manufactured especially for use in the construction of 10-year, 15-year and 20-year Bonded Roofs. These products conform with the requirements of the U. S. Government Specifications and Underwriters' Laboratories. A surety bond issued by the National Surety Corporation will be furnished upon completion of a Reilly 10, 15, or 20-year Bonded Roof, which has been subject to the careful inspection of our own inspector during its entire construction by a Reilly Approved Roofing Contractor.

In cases where the surety bond and inspection service are not essentially of interest, the application of Reilly Coal Tar Pitch and Reilly Tarred Felt in accordance with approved specifications provides the most durable, modern and satisfactory type of roof construction.

Reilly Bonded Roof Specifications provide for the following types of construction:

5-Ply for use over boards—20-Year Guarantee Bond
4-Ply for use over boards—15-Year Guarantee Bond
4-Ply for use over poured concrete or Gypsum—20-Year Guarantee Bond
3-Ply for use over poured concrete or Gypsum—15-Year Guarantee Bond

Note: In cases where only a 10-year Guarantee Bond is desired, our 10-year Bond will be issued on roofs constructed in accordance with our 15-year Specifications.

WATERPROOFING

Reilly Specifications for Waterproofing are available upon request.

SPECIFICATIONS FOR REILLY BONDED ROOFS
5-Ply Roof for Use Over Boards
20-Year Guarantee Bond

(Applies for flat surfaces or where the grade does not exceed two (2) inches per foot.)

The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knotholes, and free from loose material. If roof deck slopes, it shall be properly graded to outlets.

(a) Lay one (1) thickness of sheathing paper or unsaturated Felt, weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheets at least one (1) inch.

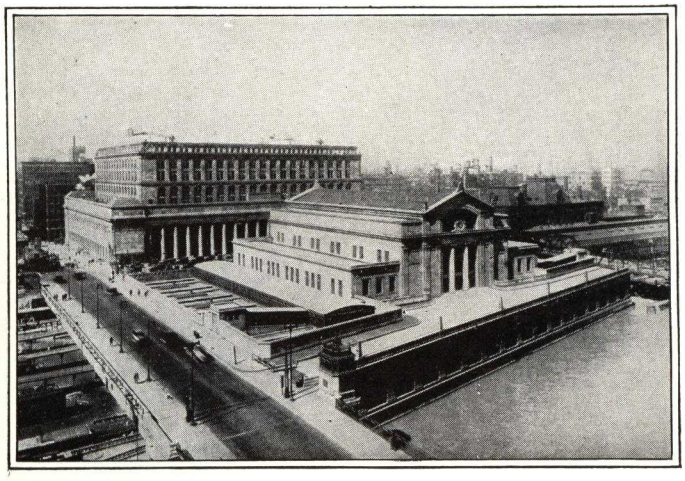
(b) Over the entire surface lay two (2) plies of Reilly Bonded Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, and nail as often as is necessary to hold in place until remaining Felt is laid.

(c) Coat the entire surface uniformly with Reilly Bonded Pitch.

(d) Over the entire surface lay three (3) plies of Reilly Bonded Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Reilly Bonded Pitch the full twenty-two (22) inches on each sheet, so that in no place shall Felt touch Felt. Such nailing as is necessary shall be done so that all nails will be covered by not less than two (2) plies of Felt.

(e) Over the entire surface pour from a dipper a uniform coating of Reilly Bonded Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

The felt shall be laid without wrinkles or buckles. Not less than one hundred and fifty (150) pounds of pitch shall be used



Installations

Reilly Roofing and Waterproofing have been installed on buildings of all types and sizes. Representative installations are shown on these pages.

At left:
Union Station, Chicago

At right:
Engineering Building, Chicago

for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

(f) The use of copper or lead for flashings and counter-flashings is recommended.

4-Ply Roof for Use Over Boards 15-Year Guarantee Bond

(Applies for flat surfaces or where the grade does not exceed two (2) inches per foot.)

The roof deck shall be of seasoned lumber, smooth and free from loose boards, large cracks or knotholes, and free from loose material. If roof deck slopes, it shall be properly graded to outlets.

(a) Lay one (1) thickness of sheathing paper or unsaturated Felt, weighing not less than five (5) pounds per one hundred (100) square feet, lapping the sheets at least one (1) inch.

(b) Over the entire surface lay two (2) plies of Reilly Bonded Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, and nail as often as is necessary to hold in place until remaining Felt is laid.

(c) Coat the entire surface uniformly with Reilly Bonded Pitch.

(d) Over the entire surface lay two (2) plies of Reilly Bonded Tarred Felt, lapping each sheet seventeen (17) inches over preceding one, mopping with Reilly Bonded Pitch the full seventeen (17) inches on each sheet so that in no place shall Felt touch Felt. Such nailing as is necessary shall be done so that all nails will be covered by not less than one (1) ply of Felt.

(e) Over the entire surface pour from a dipper a uniform coating of Reilly Bonded Pitch into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

The felt shall be laid without wrinkles or buckles. Not less than one hundred and twenty-five (125) pounds of pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

(f) The use of copper or lead for flashings and counter-flashings is recommended.

4-Ply Roof for Use Over Poured Concrete or Gypsum 20-Year Guarantee Bond

(Applies for flat surfaces or where the grade does not exceed two (2) inches per foot.)

The roof deck shall be smooth, firm, dry and free from loose material. If roof deck slopes, it shall be properly graded to outlets. On slopes exceeding one (1) inch and less than two (2) inches to the foot, roof deck shall permit nailing or creosoted wood nailing strips shall be set in the concrete flush with the surface and spaced three (3) feet apart. These strips to be placed up and down and not across the slope of the roof.

(a) Coat the concrete or gypsum uniformly with Reilly Bonded Pitch.

(b) Over the entire surface lay four (4) plies of Reilly Bonded Tarred Felt, lapping each sheet twenty-four and one-half (24½) inches over preceding one, mopping with Reilly Bonded Pitch the full twenty-four and one-half (24½) inches on each sheet so that in no place shall Felt touch Felt.

(c) When nailing is necessary nails should be placed not less than three (3) inches from the upper edge of each sheet and not more than three (3) feet apart. All nails shall be covered by not less than three (3) plies of felt.

(d) Over the entire surface pour from a dipper a uniform coating of Reilly Bonded Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

The Felt shall be laid without wrinkles or buckles. Not less than two hundred (200) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

(e) The use of copper or lead for flashings and counter-flashings is recommended.

3-Ply Roof for Use Over Poured Concrete or Gypsum 15-Year Guarantee Bond

(Applies for flat surfaces or where the grade does not exceed two (2) inches per foot.)

The roof deck shall be smooth, firm, dry and free from loose material. If roof deck slopes, it shall be properly graded to outlets. On slopes exceeding one (1) inch and less than two (2) inches to the foot, roof deck shall permit nailing or creosoted wood nailing strips shall be set in the concrete flush with the surface and spaced three (3) feet apart. These strips to be placed up and down and not across the slope of the roof.

(a) Coat the concrete or gypsum uniformly with Reilly Bonded Pitch.

(b) Over the entire surface lay three (3) plies of Reilly Bonded Tarred Felt, lapping each sheet twenty-two (22) inches over preceding one, mopping with Reilly Bonded Pitch the full twenty-two (22) inches on each sheet so that in no place shall Felt touch Felt.

(c) When nailing is necessary nails should be placed not less than three (3) inches from the upper edge of each sheet and not more than three (3) feet apart. All nails shall be covered by not less than three (3) plies of felt.

(d) Over the entire surface pour from a dipper a uniform coating of Reilly Bonded Pitch, into which, while hot, embed not less than four hundred (400) pounds of gravel or three hundred (300) pounds of slag for each one hundred (100) square feet. The gravel or slag shall be from one-quarter (¼) inch to five-eighths (⅝) inch in size, dry and free from dirt.

The Felt shall be laid without wrinkles or buckles. Not less than one hundred and seventy-five (175) pounds of Pitch shall be used for constructing each one hundred (100) square feet of completed roof, and the Pitch shall not be heated above four hundred (400) degrees Fahrenheit.

(e) The use of copper or lead for flashings and counter-flashings is recommended.

Above:
New Building, United States Supreme Court, Washington, D. C.

At Left:
New Department of Justice Building, Washington, D. C.

AMERICAN ASPHALT ROOF CORPORATION

15th Street and Blue River, KANSAS CITY, MO.

EAST ST. LOUIS, ILL. FORT WORTH, TEX. SALT LAKE CITY, UTAH

OLD AMERICAN ASPHALT ROOFINGS MADE FROM *WEATHERIZED ASPHALT

*Reg. U. S. Pat. Off.

Products

The trade name "Old American" covers a complete line of Asphalt Roofing Products, as well as a number of allied materials. Principal items are: Asphalt Shingles, Roll Roofing, Building Papers, Protective Coatings, Built-Up Roof Materials in both asphalt and pitch.

Of particular interest to the Architect and Engineer, is a group of specifications relating to the application of Old American Built-Up Materials on which a performance bond is required. These bonds guarantee maintenance expense for 10, 15 or 20 years, depending upon the type of roofing applied. They are furnished by the National Surety Corp. of New York.

Bonded roofs may be applied only by roofers specifically approved by the AMERICAN ASPHALT ROOF CORPORATION. They are competent, well established and equipped for correct and dependable work. Each roof so bonded is inspected during application by a factory representative.

Old American Roofing Is Made from Weatherized Asphalt

Old American Built-Up Asphalt Roofing contains a specially prepared, refined petroleum asphalt embodying that quality of resistance to the destructive forces of nature which a good roofing must have to endure throughout the years.

The processing and manufacture of this asphalt is controlled from start to finish by this company. From its initial introduction into the refining stills through special processes and until its actual amalgamation with other materials to form the finished products, a program of rigid control is maintained.

Throughout these processes, the asphalt is toughened, its vitality increased, and the resistant quality, which is such an important part in its use, is introduced. These processes, combined with a special selection of crude oils, produce WEATHERIZED Asphalt—an exclusive Old American product.

Write for Specifications

A complete specification is given on the opposite page, but this is only one of many specifications prepared by this company for the guidance of architects, engineers, and contractors. Listed below are some of the others and a specification manual covering these will be sent on request. Address the nearest office.

Specifications for Built-Up Roofs over Wood or Precast Gypsum and over Non-combustible Roof Decks

Guaranty bond, term of years	Maximum slope, inches per foot	Cementing material	Finished surface material
20	3	Asphalt	Gravel
20	6	Asphalt	Gravel
20	9	Asphalt	Mineral Surfaced Roofing
20	2	Coal Tar Pitch	Gravel
10/15	3	Asphalt	Gravel
10/15	6	Asphalt	Gravel
10/15	2	Coal Tar Pitch	Gravel
15	9	Asphalt	Mineral Surfaced Roofing
10	9	Asphalt	Mineral Surfaced Roofing
10	9	Asphalt	Asbestalc Surfaced Roofing
10	6	Asphalt	Asphalt

Specification for Special Types of Construction Including Flashing and Membrane Waterproofing

In addition to standard roof specifications shown above, specifications are available for special construction and special uses as follows: These include specifications for membrane waterproofing.

Roofs laid under Promenade Tile
Roofs for application over Steel Decks
Spray Pond or Condenser Table Decks
Flashings and Wall Treatments, including Flash-Lok Blocks
Swimming Pools, Girders, Highways, Reservoirs, etc.

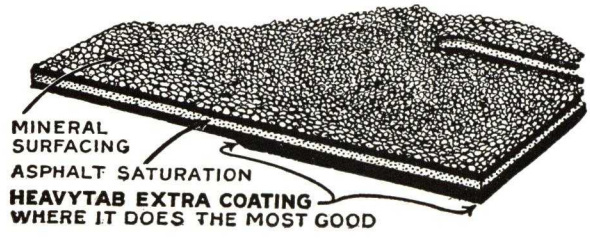
OLD AMERICAN HEAVYTAB STRIP SHINGLE

The Heavytab Strip Shingle is an outstanding example of the line of Asphalt Shingles bearing the trade name Old American. It embodies a new idea in asphalt shingle construction. Basically a squaretab shingle, its strength and wear resistance have been greatly increased by building an extra heavy coating of WEATHERIZED Asphalt on the *underside* of the exposed portion of the shingle.

Advantages

The advantages of this construction are confirmed by years of experience and observation.

More Waterproofing per Dollar—Asphalt functions best as a waterproofing agent when it is protected from the direct wear of the weather as in Heavytabs.



Longer Service—Asphalt saturation—the life of an asphalt shingle—is doubly guarded and hence the life of the roof is prolonged.

Greater Security—The tendency of each shingle to fit snugly to the course below is aided by the thickness of the coating and increased weight of the tab.

Attractive Appearance—The thicker butt produces a heavier shadow, thus a richer coloring on the roof.

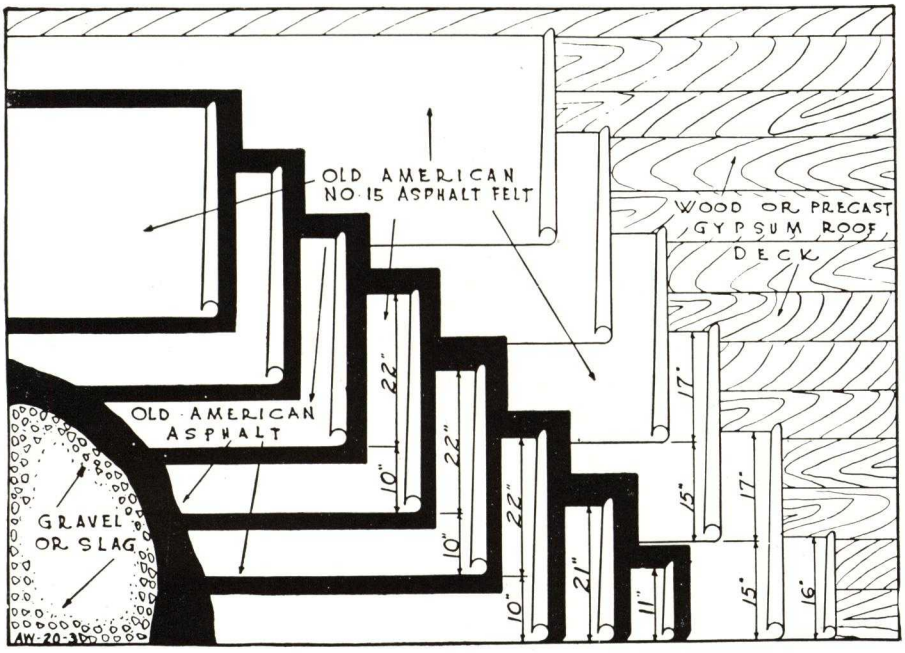
Increased Rigidity—The reinforcing of asphalt on the tab of the shingle extends up beyond the nailing line. Thus the binding effect of the nail is made more effective the full length of the tab.

OLD AMERICAN SPECIFICATION NO. A. W. 20-3

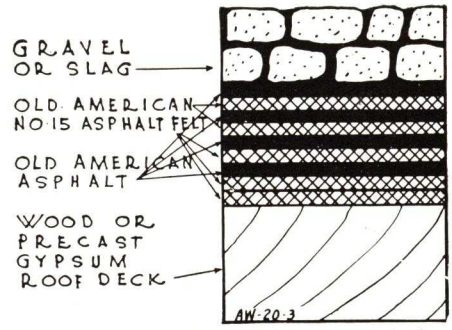
20-YEAR BOND

ASPHALT FELT AND ASPHALT, GRAVEL OR SLAG FINISH

(Typical Specification Sheet)



For Use Over Wood or Precast Gypsum
For Inclines Up to Three (3) In. per Ft.



Approximate quantities of materials required for the construction of each 100 sq. ft. of completed roof surface:

Old American No. 15 Asphalt Felt, Five (5) Thicknesses	75 lbs.
Old American Asphalt	140 lbs.
Roofing Nails and Flat Tin Discs	2 lbs.
Roofing Gravel	400 lbs.
	617 lbs.

The felt shall be laid without wrinkles or buckles. Asphalt shall be heated from 400° F. to 425° F., not in excess thereof.
In estimating, we suggest adding 5% extra to provide for end laps and turn up on walls where needed.

Roof Deck

The roof deck shall be of seasoned lumber, smooth, dry and free from loose materials, and all large cracks or knot holes shall be filled or covered. Gypsum precast slabs shall be properly grouted. If roof deck is inclined, it shall be properly graded to outlets. All drainage connections shall be set to permit free flow of water. Cant strips shall be provided in all angles formed by the roof deck and vertical surfaces. The foregoing requirements are obligations of the Owner or General Contractor.

Application of Materials

FIRST: Lay over the entire surface two (2) thicknesses of Old American No. 15 Asphalt Felt, lapping each sheet seventeen (17) inches over the preceding one and nail with seven-eighths (⅞) inch roofing nails driven through flat tin discs at intervals of six (6) inches along the laps and stagger nailed at eighteen (18) inch intervals, on parallel lines spaced ten (10) inches apart. All felts thus laid shall be cut off at the top of the cant strip.

If 36-inch width felt is used, felt shall be lapped nineteen (19) inches.

Alternate: One thickness of Old American No. 30 Asphalt Felt lapped two (2) inches, may be used in lieu of two (2) thicknesses of No. 15 Asphalt Felt mentioned above, nailed in a like manner.

SECOND: Over the entire surface imbed in Old American Asphalt three (3) thicknesses of Old American No. 15 Asphalt Felt, lapping each sheet twenty-two (22) inches over the preceding one, rolling each sheet immediately behind the mop to insure a complete and uniform coating of hot asphalt, so that in no place shall felt touch felt. All ends of felts to be lapped six (6) inches. All felts thus laid shall be cut off at the top of the cant strip.

If 36-inch width felt is used, felt shall be lapped twenty-four and two-thirds (24⅔) inches.

THIRD: After all felts have been laid and all flashings and connections installed, pour from a dipper a uniform coating of Old American Asphalt, into which, while hot, imbed not less than 400 lbs. of gravel or 300 lbs. of slag per each 100 square feet of surface. The gravel or slag shall be dry and free from dirt, and shall be from one fourth (¼) inch to five-eighths (⅝) inch in size.

Insulation

If roof is to be applied over insulating material, the insulation must be firm, capable of withstanding traffic without crushing, and of a type that will retain nails.

No more insulation shall be laid at one time than can be promptly protected by roofing in event of sudden weather changes.

Where insulating materials meet parapet walls, cant strips, curbs, or other openings, the edge of such insulating material shall be protected by mopping a felt (or saturated fabric) strip to the roof deck, under the insulating material, folding this strip back and mopping it to the top of the insulating material, for a distance of not less than four (4) inches from the edge. When more than one layer or thickness of insulating material is used, each layer shall break joints with the preceding layer.

The built-up roof to be applied over insulation shall be constructed in accordance with Old American Specification No. A. C. 20-3.

Leader Heads, Vents, Etc.

Leader Heads, Vents and other openings shall be furnished with metal flanges of sufficient width (5" to 6" recommended) to permit proper connection with the roofing. All scuppers, gutters, gravel guards, edging or finishing strips, leader heads and vent flanges, shall be set on top of all felts, same to be securely nailed and flashed with not less than two (2) thicknesses of felt, mopped in.

Note: The AMERICAN ASPHALT ROOF CORPORATION will give its Twenty (20) Year Surety Guaranty Bond covering the roof, providing same is applied by a roofing contractor approved by the AMERICAN ASPHALT ROOF CORPORATION, in strict accordance with the above specifications and subject to their inspection and approval.

This guaranty is not given on jobs of less than 50 squares, nor in such sections of the United States as are not regularly covered by the Manufacturers Inspection Service, except by special arrangement.

BIRD & SON, inc.

Manufacturers of Bird Asphalt Shingles and Siding

MILLS AND GENERAL OFFICES

EAST WALPOLE, MASS.

CHICAGO OFFICE AND PLANT: 1472 West 76th Street

NEW YORK OFFICE: 295 Fifth Ave.

SHREVEPORT, LA., Office and Plant: Aero Drive

CANADA: Building Products Ltd., HAMILTON, ONT., MONTREAL, QUE.

For Catalog on Built-up Roofing and Flashings, see File Index.

QUALITY HIGHLIGHTS OF BIRD SHINGLES AND SIDING

Specially Prepared Felt

The felt used in Bird roofing is made by a special felting machine and the fibres are actually felted, allowing the felt to be thoroughly saturated.

Complete Saturation

The Immersion Process used in saturating Bird Felt permits 190% to 200% saturation, well above Underwriters' Laboratory Specifications. A completely saturated felt is essential because this is the foundation on which the roofing is built.

Special Shatter-Resistant Coating

This quality is obtained by special preparation of the coating asphalt and gives a more workable and durable product.

Every Granule Firmly Embedded

The Mineral granules used in surfacing Bird shingles and sidings are thoroughly cleaned and primed with oil to assure a firm embedding of every granule. This firm embedding gives better appearance and greater durability.

Durable Color

Because of particular selection and Bird controlled coloring process, all surfacing granules used in Bird shingles are durable.

Wide Distribution

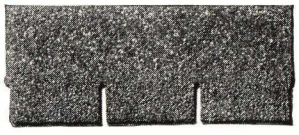
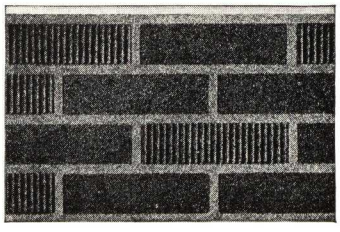
Bird Shingles, Sidings, and Building Materials are stocked in all parts of the United States, east of the Rocky Mountains, by reputable dealers.

Climatic Resistance

Bird Asphalt Slate Surfaced Shingles and Siding will meet every climatic resistance.

High, low, and extraordinary temperature changes will not impair their protective efficiency, beauty, and durability.

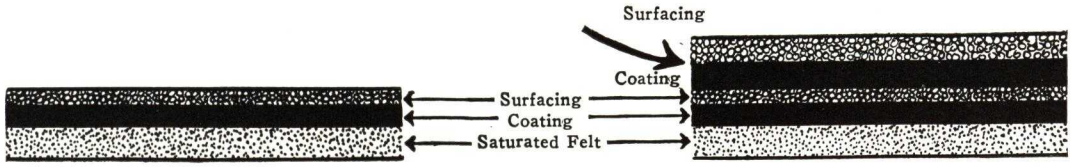
TYPES AND SPECIFICATIONS OF BIRD ASPHALT SHINGLES OF SPECIAL INTEREST TO ARCHITECTS

Name	Shape of Shingle	Color	Size, in.	Approx. Wt., lbs.	No. Shingles per sq.	Head Lap, in.	Exposure, in.
WEATHER-TEX 3 in 1 Thick Butt SHINGLES		Green Dura Green Slate Blende	12x36	210	80	2	5
SPECIAL 3 in 1 Thick Butt SHINGLES		Bright Red, Green, Dura Green, Black, Russett Glo, Slate Blende, Sunset Blende, Mt. Green Blende.	15x36	251	80	5	5
INSULATED BRIC SIDING		Bright Red White Mortar Blende B. White Mortar	12 wide 8½ ft. long	194	12		

An exterior finish of brick design with a ½ in. of insulating board.

BIRD THICK BUTT SHINGLES

Have Additional Layers of Real Protection



Cross Section of Ordinary Shingle Construction

Cross Section of Bird Thick Butt Construction

Advantages of Bird Thick Butts

1. Added life because there are double layers of asphalt and surfacing mineral on the exposed portion.

2. Added beauty because the black background showing through the cut-outs more clearly defines the units of color and gives deeper shadow effects.

3. Added weight and massiveness where most needed.

4. Added fire resistance because of extra mineral.

5. Added thickness of butt makes them conform better to roof deck.

6. Added protection because the extra weight on exposed portion holds them firmly in place.

Special Treatment of Mineral

The mineral used in the surfacing of Bird Shingles is specially treated with a low volatile, free flowing, colorless oil. This oil application cleans and primes the granule, thereby allowing a perfect bonding with the asphalt coating. The mineral is then heated to insure firm embedding in the asphalt coating.

"Shatter-Resistant" Coating

The coating asphalt used in Bird Shingles to seal the saturated felt base and hold the mineral surfacing in place is so treated that it is rendered "Shatter-Resistant." This makes Bird Shingles easier to handle in cold weather and more durable because the ice forming on them will not tear off the mineral surfacing as it melts and slides down the roof.

This special process permits the application of a greater percentage of mineral surfacing. This accounts for the famous "Shatter-Resistant" coating, well known in Bird Thick Butt Shingles.

BIRD NEPONSET BLACK BUILDING PAPER

A Building Standard for Over 40 Years

As a Sheating Paper Over Outside Sheathing—Wall Uninsulated

Neponset Black Building Paper has been known and specified by architects for years as a waterproof building paper of the highest grade. A strong-bodied paper thoroughly saturated with asphalt, protected with asphaltic coating on both sides, giving an absolutely waterproof paper. Recommended particularly for use:

1. Under all kinds of roofing.

2. Behind clapboards and shingles or stucco on the walls of buildings.

3. Between floors.

4. Between double floors that extend over an open porch.

5. Within walls of house, store or factory in place of backplaster.

6. For cellar lining.

7. For cold storage work.

Put up in rolls 36 in. wide containing 500 sq. ft., weighing 50 lbs. per roll.

Specifications for Use of Bird Neponset Black Waterproof Building Paper

Beneath Clapboards and Shingles—Underneath the clapboards or shingles shall be applied 1 layer of Bird Neponset Black Waterproof Building Paper, lapped not less than 2 in. and tacked to hold in place.

Beneath Roofing—Underneath the roofing, 1 layer of Bird Neponset Black Waterproof Building Paper shall be applied; paper to be lapped not less than 2 in. and tacked along the seams, sufficient to hold in place.

Back of Stucco—Over the sheathing boards 1 layer of Bird Neponset Black Waterproof Building Paper lapped not less than 2 in. Hold paper in place with furring strips spaced about 16 in. on center. Nail metal lath firmly to furring strips and apply stucco to the lath.

Beneath Double Floors—Between the double floors or underneath the parquetry shall be placed 1 layer of Bird Neponset Black Building Paper. Paper to be lapped not less than 2 in. and tacked sufficiently to hold in place.

Specifications for Use of Bird Neponset Black Waterproof Paper for Walls or Ceilings Insulated With a Fill Insulation

Nail Neponset Black Building Paper over the studs, right over the insulation and under the lath and plaster. The sheets should be lapped and joined on the studs, carried to the ceiling and floor, so as to leave no opening through which vapor may pass to the insulation. In the case of ceilings, Neponset Black Building Paper should be nailed to the furring strips before the lath is applied.

When Neponset Black Building Paper is applied according to this specification to prevent moisture penetrating Fill Insulation, Bird 30 lb. Super Sheating, or 15 lb. Asphalt Felt should be used as the sheathing paper over the rough outside body and beneath the finished shingles or clapboards.

Where Rock Wool, Asbestos or other insulation is used in the stud spaces, or between rafters of a ceiling, Bird Neponset Black Building Paper should be used to prevent penetration of moisture and the consequent condensation which may result in damaging the walls by water or greatly reduce the value of the insulation.

It is necessary that this specification be followed in the case of Fill Insulations of the type of Rock Wool, Asbestos, etc., to prevent the water from new plaster reaching the insulation and being absorbed by it, which will greatly reduce its insulating value and at a later time may stain the walls and ceilings.

This specification will also guard against humidity in air-conditioned houses from reaching the Fill Insulation and condensing there.

MEMORANDA

PRODUCT DATA

FLINTKOTE

ASPHALT *and* ASBESTOS SHINGLES *and* SIDINGS · BUILT-UP ROOFING · ROLL ROOFING ROCK WOOL *and* BOARD INSULATION

FLINTKOTE ASPHALT • •

Flintkote Asphalt Shingles

The chart on this page describes the four major types of Asphalt Shingles that are available and gives comparative information concerning them.

Asphalt Shingles are made of:

(1) FELT, a durable fabric that forms their foundation.

(2) A SATURANT of asphalt, the waterproofing agent which penetrates the felt and forms a protective coating around the fibres.

(3) A COATING of specially prepared asphalt on top and back that seals in the saturant and makes the Shingle weatherproof.

(4) A SHIELD of weather and fire resistant colored minerals firmly imbedded in the outer coating, which combines beauty with safety and forms the final protection against the weather.

Flintkote Products

Asphalt Shingles and Siding
Asbestos Shingles and Siding
Built-up Roofing
Roll Roofing
Asphalt Emulsions
Protective Coatings

For:

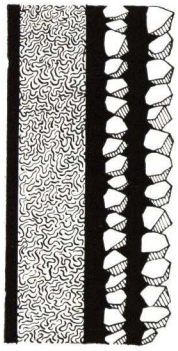
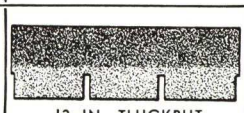
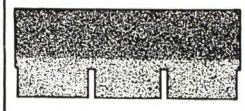
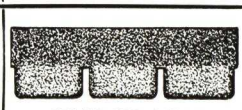
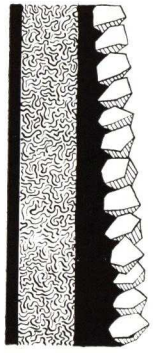
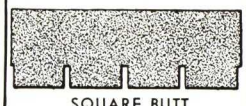
Rock Wool Insulation
Insulation Board
Hard Board

See File Index

Sales Offices

NEW YORK, N. Y......50 W. 50th St.
ATLANTA, GA.....1215 Sylvan Rd., S.W.
BOSTON, MASS...826 Park Square Bldg.
CHICAGO, ILL.....624 So. Michigan Ave.
DETROIT, MICH.....14201 Schaefer Hwy.
NEW ORLEANS, LA......
.....Poland and Galvez St.
WACO, TEX......Superior Life Bldg.

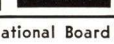
Products of the same high quality are sold by the Beckman-Dawson Roofing Company and Richardson Roofing, affiliates of The Flintkote Company.

Types and Descriptive Data		Product	
	**THIKBUT SHINGLES** The drawing at the left is a cross section of the butt of a *Thikbut* Shingle. Thikbut Shingles are standard shingles that have an extra protective coating of asphalt and an additional surfacing of mineral thus providing twice as much material on the exposed portion of the shingle. This is the most satisfactory and economical type of Asphalt Shingle.	 12 IN. THICKBUT  15 IN. THICKBUT	**Strips** 12 in. Thikbut 15 in. Thikbut ▲
	SETAB SHINGLES The drawing at the left is a cross section of the butt of a *Setab* Shingle. Setab Shingles are standard shingles that have been hand dipped in asphalt and minerals thus completely sealing the felt at the exposed edge.	 STANDARD SETAB TAPERED SETAB	**Strips** Standard Tapered Setab †
	**TAPERED SHINGLES** The drawing at the left is a cross section through the butt of a *Tapered* Shingle. Tapered Shingles are standard shingles with a tapered coating of asphalt on the exposed side of the shingle thus providing extra thickness at the butt.	 TAPERED TAPERED STRIP	**Individuals** Tapered ★ † ▲ **Strips** Tapered †
	STANDARD SHINGLES The drawing at the left is a cross section through the butt of a *Standard* type of shingle. Standard Shingles are composed of one layer of felt saturated with asphalt and surfaced on the top surface with fire resisting materials.	 SUPER GIANT  SQUARE BUTT SPECIAL HEXAGON	**Individuals** Dutch Lap Super Giant **Strips** 10 in. Square Butt 12½ in. Square Butt ▲ 12 in. Giant Square Butt † ▲ 11⅓ in. Spec. Hexagons 12⅓" Spec. Hexagons ⊙ ▲

★ Not available in East.
† Not available in South.
⊙ Not available in Middlewest.
▲ Not available in Pacific Coast Zone.

*Subject to change without notice.

• • SHINGLE PRODUCT DATA*

Dimensions Inches	Shingles Per Sq.	Bundles Per Sq.	Aver. Approx. Wt.	Underwriters' Label**	Headlap Inches	Exposure Inches	Relative Cost Material Only (See Footnote)	Colors (Note: Numerals refer to color reproductions on rear cover)
12 x 36	80	3	210#	"C"	2	5		Blue Black (2), Tile Red (3), Clover Green (7), Mottled Red (1), Mottled Green (8), Mottled Gray (4), Mottled Brown (5) ★ ▲, Dusk Blue ★ ▲.
15 x 36	80	3	250#	"C"	5	5		Blue Black (2), Tile Red (3), Clover Green (7), Mottled Red (1), Mottled Green (8), Mottled Gray (4) ★.
12 x 36	80	3	230#	"C"	2	5		Blue Black (2), Tile Red (3), Clover Green (7), Canyon Red (1), Canyon Green (8), Canyon Brown (5), Canyon Gray (4), Georgian Green (8), Green (6), Dusk Blue.
12 x 36	80	4	355#	"C"	2	5		
10 x 13½	300	4	360#	"C"	4½	4½		Blue Black (2), Tile Red (3), Clover Green (7), Green (6), Antique Brown, Slate Blend (4), Red Blend (1), Green Blend (8).
12 x 36	80	3	275#	"C"	2	5		Blue Black (2), Tile Red (3), Clover Green (7), Green (6), Warm Blend (1), Kool Blend (8).
12 x 16	113	2	162#	"C"	2	10 x 13		Blue Black (2), Tile Red (3), Clover Green (7), Green (6) ⊙, Red Blend (1) †, Green Blend (8) †, Weathered Brown (5) ⊙.
12 x 16	226	4	325#	"C"	6	5		
10 x 36	100	2	210#	"C"	2	4		Blue Black (2), Tile Red (3) †, Clover Green (7), Green (6), Warm Blend (1) †, Kool Blend (8).
12½ x 36	100	3	266#	"C"	4½	4		
12 x 36	80	3	257#	"C"	2	5		Blue Black (2), Tile Red (3), Clover Green (7), Green (6), Spring Blend (8), Autumn Blend (1).
11⅓ x 36	86	2	167#	"C"	2	4⅔		
12⅓ x 36	86	2	186#	"C"	3	4⅔		Blue Black (2), Tile Red (3), Clover Green (7).

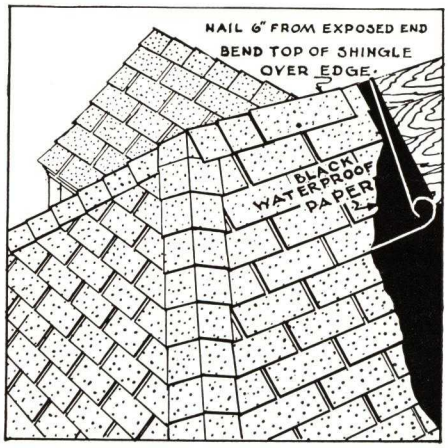
**All products listed above carry the approved Class "C" Label of the National Board of Fire Underwriters.

NOTE—The graphs in the "Relative Cost" column above represent the relative sales prices of material only. Labor costs are not included. The longer the line, the more expensive the product.

ASPHALT SHINGLES • • •

General Information

Asphalt shingles must be applied on slopes having an incline of 4 in. or more to the foot. Asphalt Saturated Felt or Black Waterproof Paper should be applied over the deck before applying shingles. Only well seasoned boards of narrow width and uniform thickness should be used. While plaster is drying, adequate ventilation in the building should be provided to prevent warpage or swelling of roof sheathing. Chalk lines should be established from ridge to eaves and across roof to assure proper exposure and alignment of shingles. Shingle cutouts may be broken in thirds or halves. As with all quality materials good performance depends upon proper application, therefore, the detailed application Directions included in each square of shingles should be followed.



HIPS AND RIDGES

Individual shingles of the same color should be used to cover all hips and ridges, applied in overlapping manner (Boston style) with not more than 5 in. exposed, and nailed 6 in. from the exposed edges on each side of hip or ridge. No nails should be exposed. Shingles should be warmed in the sun before bending over ridges. If individual shingles of the same color are not available, strip shingles may be cut into individuals and used. The exposed portion of the shingles should be applied away from prevailing winds.

VALLEYS

Valleys should be laid with two thicknesses of mineral surfaced roofing, one 9 in. wide with another 18 in. wide on top, applied before shingles are laid so that shingles will overlap valleys. Shingles should be trimmed to leave a trough 6 in. wide at the ridge and 8 in. wide at the eaves, and nailed 2 in. apart and 1 in. from the valley with all nail heads covered with Flintkote Plastic Fibrated Cement. Shingles should be sealed to valleys with Flintkote Plastic Cement applied in ribbons 2 in. wide. Chimneys, dormers, skylights, etc., should be flashed with prepared roofing and Flintkote Plastic Fibrated Cement. Flashings should extend well under shingles. All counter flashings should be of metal.

EAVES AND STARTERS

On all eaves a galvanized iron drip edge 12 in. wide, painted on both sides should be applied. Over this, 18 in. mineral surface Roll Roofing should be applied as a starter course, flush with eave. It should be nailed at 24 in. intervals along eave about 3 in. from edge. Shingles may then be applied as specified in the direction sheets.

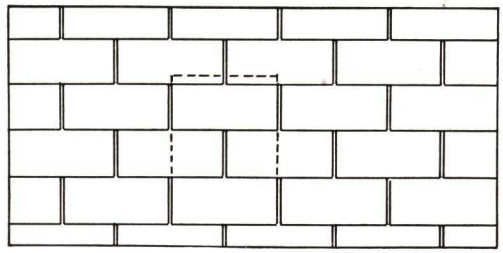
• • • APPLICATION AND DETAILS

Individuals

There are three common methods employed in applying individual shingles—the American Method, the Wide Space Method, and the Dutch Lap Method. All methods make a good roof, but differ in appearance and life. (The drawings explain the appearance and method of application.) 1½ in. x 12 gauge galvanized iron nails with 7/16 in. heads should be used.

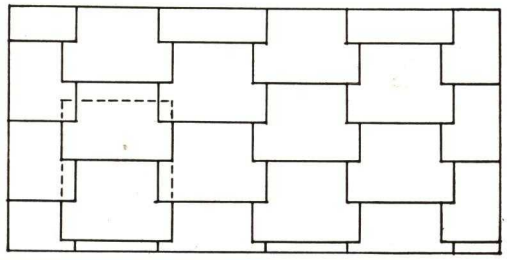
AMERICAN METHOD

The American Method illustrated at the right is the most commonly used. While the American Method is the most pleasing in appearance, it required the maximum amount of material. Requires 3 lbs. of nails per square.



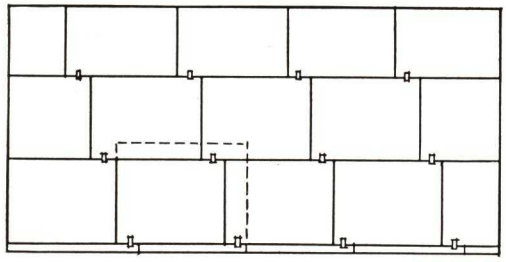
WIDE SPACE METHOD

The Wide Space Method shown at the right, while less pleasing in appearance, assures a safe roof and uses only two-thirds as much material. Requires 2¼ lbs. of nails per square.



DUTCH LAP METHOD

The Dutch Lap Method is the most economical since it requires only one-half as much material as the American Method. This method requires the use of copper clips under one corner and has a head lap of 2 in. and a side lap of 3 in. Requires 1½ lbs. of nails per square.

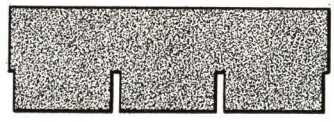


Strip Shingles

Strip Shingles are 36 in. long and vary in width from 10 to 15 in. and comprise three (and sometimes four) shingles in one piece of material. These naturally are more economical to apply than Individual Shingles since three (or four) shingles may be laid in about the same time as one Individual. There are two general classes of Strip Shingles—Square Butt Shingles and Hexagonal.

SQUARE BUTT STRIP SHINGLES

The cut at the right shows a Square Butt Strip Shingle. When these are applied on the roof they have the appearance of American Method Shingles and give the same coverage. Four 1 in. x 11 gauge with 7/16 in. head galvanized iron nails should be used with each shingle nailed through the shingle ½ in. directly above the cutout.



HEXAGON STRIP SHINGLES

The cut at the right shows a Hexagon Strip Shingle. This is a very economical product providing good protection. Hexagon Strip Shingles are best suited where low cost is of great importance. Four 1 in. x 11 gauge 7/16 in. head galvanized iron nails are required for each shingle. Nails should be located ½ in. above cutout and end nails ¾ in. from edge of shingle.

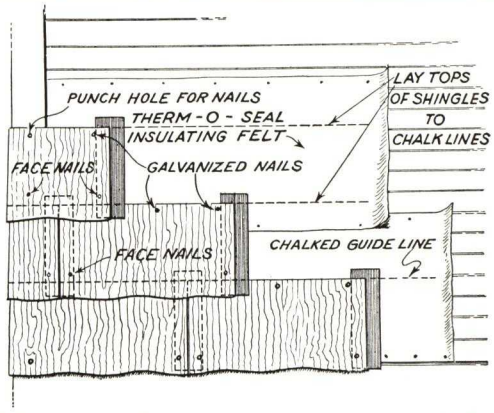
ASBESTOS CEMENT • • •

Characteristics

Flintkote Asbestos roofing and siding materials are manufactured from Pure Asbestos fibres and Portland Cement which are formed into the various shingle shapes under hydraulic pressure. Both of these materials are non-combustible, thus resulting in fireproof products. These permanent materials will last almost indefinitely and do not require painting or staining to preserve their life. Asbestos Roofing. Shingles are available in natural gray, green, red and blue-black; Asbestos Sidings in silver gray, white and in the several different styles shown in the table below.

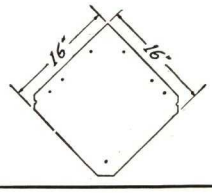
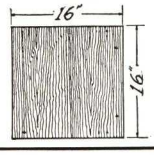
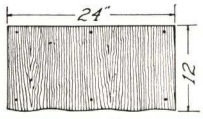
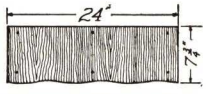
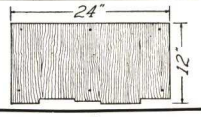
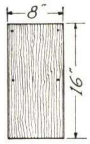
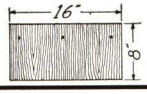
GENERAL APPLICATION INFORMATION

All surfaces over which Asbestos Shingles are to be applied should be smooth and true. Asbestos Shingles should always be kept in a dry place until applied. All cutting or punching of Asbestos Shingles should be done with an Asbestos Shingle Cutter, which is especially designed for this purpose. The use of a waterproof felt under shingles is necessary. Detailed application directions are included in each square of the shingles and should be followed for satisfactory results.



All valleys and flashings should be of the metal most durable for the locality. Special starting shingles are available where required. The drawing above illustrates the method of applying Asbestos Siding.

PRODUCT DATA — FLINTKOTE ASBESTOS CEMENT ROOFING AND SIDING*

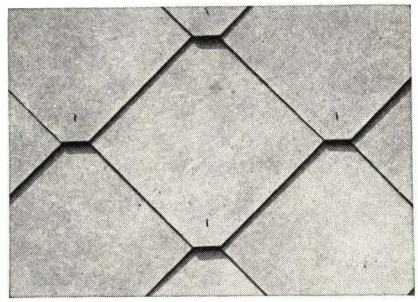
Product		Dimensions Inches	Approx. Weight per sq.	Shingles per sq.	Head Lap Inches	Side Lap Inches	Exposure Inches
ROOFING SHINGLES							
Hexagonal French Method No. 10		16 x 16 x 5/32	265#	86	.....	3	13 x 13
Dutch Lap Method No. 20		16 x 16 x 5/32	280#	92	3	4	12 x 13
SIDING SHINGLES							
Waveline** No. 60		12 x 24 x 5/32	185#	57	1½	.....	10½ x 24
Waveline** No. 70		7¾ x 24 x 5/32	210#	96	1½	.....	6¼ x 24
Shake** No. 80		12 x 24 x 5/32	195#	60	1¼-2	.....	10 x 24
Wide Space No. 100		8 x 16 x 5/32	245#	160	2	1½	Top 7 x 5 Butt 7 x 8
Top Lap No. 150		8 x 16 x 5/32	245#	165	2½	.....	5½ x 16

*Subject to change without notice.
**Vertical Joint Strips and face nails are supplied in package.

• • ROOFING AND SIDING PRODUCTS

HEXAGONAL METHOD ROOFING SHINGLES

Hexagonal Roofing Shingles are smooth surfaced shingles sixteen inches square, laid as shown in the illustration at the right. A small copper storm anchor is used at the lower end of the shingle holding it securely in place. Special starting course shingles are available and should be used.



HEXAGONAL METHOD

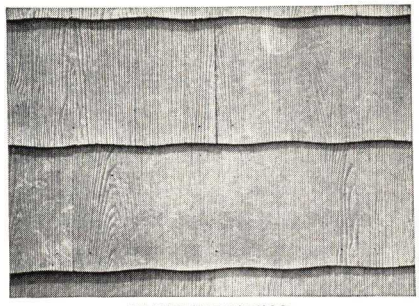
DUTCH LAP METHOD ROOFING SHINGLES

Dutch Lap Method Roofing Shingles are sixteen inches square with the grain of cypress reproduced as a surface pattern and are laid as shown in the illustration at the right. A small copper clip is used at the lower corner. Dutch Lap Method Roofing Shingles may be laid with 1/4 or 1/3 side lap. With the 1/3 side lap vertical joints break directly above each other in every other course similar to the American Method of application.

DUTCH LAP METHOD

WOODGRAIN SIDING SHINGLES

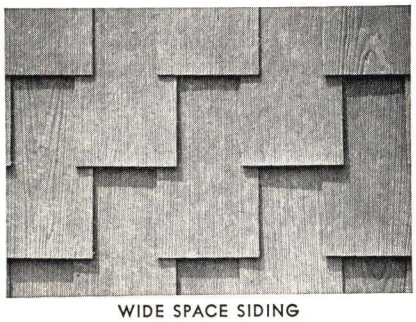
The illustration at the right shows the appearance of woodgrain Asbestos Siding Shingles. The product shown is our 12 x 24 in. Waveline material. This same type siding material is also available with a Shake design on the butt, and the Waveline is furnished in narrower widths (see table). Asphalt coated felt strips 3 in. wide are supplied for use under joints. Special cadmium plated face nails are supplied with each square of shingles.



WAVELINE SIDING

WIDE SPACE SIDING SHINGLES

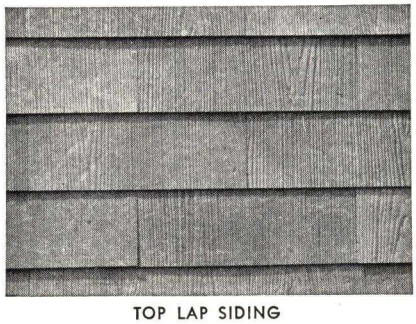
The Wide Space Siding Shingles shown at the right provide an interesting and different pattern. They may be applied with space fillers between shingles which may be flush with exposed butt or dropped one inch to make more interesting effects. These shingles are applied without felt strips or face nails.



WIDE SPACE SIDING

TOP LAP SIDING SHINGLES

Top Lap Siding Shingles are smaller units being only 8 x 16 in. and are laid with a narrow exposure. They have a straight edge in contrast to the Waveline and Shake Designs. No face nails are required with this product. All 24 in. long Asbestos Siding Shingles are packaged in cardboard containers with steel straps to protect them.



TOP LAP SIDING

FLINTKOTE BUILT-UP ROOFING

ENGINEERING SERVICES BY ROOFING ENGINEERS

Flintkote Sales Engineers are prepared to furnish definite recommendations as to the correct type of roof to be used with any type of construction. Any special problem may be referred to them with assurance of cooperation.

BUILT-UP ROOFING MATERIALS AND APPLICATION

Flintkote Built-up Roofing Materials are manufactured in our own plants according to our strict specifications. With this control of manufacture quality of product is certain and identical in all respects from all of our factories.

Flintkote Bonded Built-up Roofs are applied only by Flintkote approved roofers insuring a roof built to exact specifications as required by THE FLINTKOTE COMPANY.

TYPES AND FINISHES OF BUILT-UP ROOFS

Flintkote specifications have been made complete by incorporating the following types of built-up roofing construction, each for a specified term of years:

(1) Smooth Surfaced Asphalt Roofs; **(2)** Gravel or Slag Surfaced Asphalt Roofs; **(3)** Crushed Slate Surfaced Asphalt Roofs; **(4)** Coal Tar Felt and Pitch Roofs.

All of the above roofs will be bonded if desired.

BOND FOR BUILT-UP ROOF AND FLASHINGS

If a Flintkote Bond is required, the roof shall be inspected by an authorized Flintkote Inspector. Such bonds will be given only when the roof is laid by an approved Flintkote Franchise Roofer in strict accordance with specifications.

Flintkote Standard Flashing Specifications used in conjunction with a bonded roof specification, will carry a flashing endorsement for a period of years corresponding to the type of flashing used.

VISKALT COMPOUND

Viskalt Compound is an especially refined asphalt used where a superior product is desired and is particularly required for smooth surface roofs.

FLINTKOTE VISKALT SATURATED FELT

Viskalt Saturated Felt is the highest quality type of felt in both material and manufacture for use in built-up roofing. The high quality of this felt is maintained because of the fact that it is super-saturated with the same type of bitumen used in the production of Viskalt. This felt carries the Underwriters' Label as provided for built-up roofing purposes.

Made in weights of 14 lbs., 15 lbs. and 30 lbs. per 100 sq. ft.

TABULATED SPECIFICATIONS FOR VARIOUS TYPES OF FLINTKOTE BUILT-UP ROOFING †

Period of bond—years	Specification Designation	Page No.	Limitations of roof incline in inches per foot	Surface finish	Construction: Number of plies of felt	Construction: Layers of bitumen	Material weights: Primer	Sheathing paper	Base sheet	Asphalt felt	Tarred felt	Rex construction	Cap sheet	Asphalt	Pitch	Viskalt	Static roof coating	Gravel	Slag	Smooth	Weight per square: Mineral surfaced	Gravel surfaced	Slag surfaced	Underwriters classification
Standard Specifications for Wood or Precast Gypsum Decks																								
20	**A-3-W**	9	¼ up to 3	Gravel or slag	One 30-lb. felt (asphalt) Three 15-lb. felts (asphalt)	4	....	....	32	49	....	....	....	140	....	....	....	400	300	....	....	621	521	A
20	**A-4-W**	9	¼ up to 2	Gravel or slag	Five 15-lb. felts (tar) One sheathing paper	4	....	5	....	....	81	....	....	....	150	....	....	400	300	....	....	636	536	A
15	**B-3-W**	9	¼ up to 3	Gravel or slag	One 30-lb. felt (asphalt) Two 15-lb. felts (asphalt)	3	....	....	32	32	....	....	....	110	....	....	....	400	300	....	....	574	474	A
15	**B-4-W**	9	¼ up to 2	Gravel or slag	Four 15-lb. felts (tar) One sheathing paper	3	....	5	....	....	65	....	....	....	125	....	....	400	300	....	....	595	495	A
15	**B-2-W**	9	3 up to 9	Mineral	Three 15-lb. felts (asphalt) Rex Construction	4	....	....	....	49	....	110	....	120	....	....	....	....	....	....	279	....	....	C
10	**C-3-W-S****	9	3 up to 6	Gravel or slag	Five 15-lb. felts (asphalt)	5	....	....	....	81	....	....	....	125	....	....	....	325	250	....	....	531	456	C
10	**C-1-W-C**	9	¾ up to 3	Cap sheet	One 34-lb. base sheet Two 15-lb. felts One 34-lb. cap sheet	3	....	....	35	32	....	....	34	90	....	....	....	....	....	191	....	....	....	C
10	**C-2-W**	9	3 up to 9	Mineral	Two 15-lb. felts (asphalt) Rex Construction	2	....	....	....	32	....	110	....	60	....	....	....	....	....	....	202	....	....	C
10	**C-1-W**	9	¾ up to 3	Viskalt	One 30-lb. felt (asphalt) Two 15-lb. felts (asphalt)	3	....	....	32	32	....	....	....	....	....	90	....	....	....	154	....	....	....	C
10	**C-1-W-E**	9	¾ up to 3	Static roof coating	One 30-lb. felt (asphalt) Two 15-lb. felts (asphalt)	3	....	....	32	32	....	....	....	60	....	....	30	....	....	154	....	....	....	C
Standard Specifications for Non-combustible Decks																								
20	**A-3-C**	10	¼ up to 3	Gravel or slag	Four 15-lb. felts (asphalt)	5	9*	....	....	65	....	....	....	180	....	....	....	400	300	....	....	654	554	A
20	**A-4-C**	10	¼ up to 2	Gravel or slag	Four 15-lb. felts (tar)	5	....	....	....	....	65	....	....	....	200	....	....	400	300	....	....	665	565	A
15	**B-3-C**	10	¼ up to 3	Gravel or slag	Three 15-lb. felts (asphalt)	4	9*	....	....	49	....	....	....	150	....	....	....	400	300	....	....	608	508	A
15	**B-4-C**	10	¼ up to 2	Gravel or slag	Three 15-lb. felts (tar)	4	....	....	....	....	49	....	....	....	175	....	....	400	300	....	....	624	524	A
15	**B-2-C**	10	3 up to 9	Mineral	Two 15-lb. felts (asphalt) Rex Construction	4	9	....	....	32	....	110	....	120	....	....	....	....	....	....	271	....	....	C
10	**C-3-C-S****	10	3 up to 6	Slag or gravel	Four 15-lb. felts (asphalt)	5	9*	....	....	65	....	....	....	125	....	....	....	325	250	....	....	624	449	C
10	**C-1-C-C**	10	¾ up to 3	Cap sheet	Three 15-lb. felts (asphalt) One 34-lb. cap sheet	4	9	....	....	49	....	....	34	120	....	....	....	....	....	212	....	....	....	C
10	**C-2-C**	10	3 up to 9	Mineral	One 15-lb. felt (asphalt) Rex Construction	3	9	....	....	15	....	110	....	90	....	....	....	....	....	....	224	....	....	C
10	**C-1-C**	10	¾ up to 3	Viskalt	Three 15-lb. felts (asphalt)	4	9	....	....	49	....	....	....	....	....	120	....	....	....	178	....	....	....	C
10	**C-1-C-E**	10	¾ up to 3	Static roof coating	One 30-lb. felt (asphalt) Two 15-lb. felts	4	9	....	32	32	....	....	....	90	....	....	30	....	....	193	....	....	....	C
Standard Specifications for Under Promenade Tile																								
10	**C-1-P**	11	Up to 1	Tile	Five 15-lb. felts (asphalt)	6	9	....	....	81	....	....	....	180	....	....	....	....	....	270	....	....	....	....
10	**C-4-P**	11	Up to 1	Tile	Five 15-lb. felts (tar)	6	....	....	....	....	81	....	....	....	200	....	....	....	....	281	....	....	....	....

*Primer required only on gypsum decks.

**A similar type of specification for steep inclines is available for 20-yr. bond period.

Over steel decks with at least ½-in. layer of insulation any specification for non-combustible decks may be used, provided that on all decks having inclines of over 3 in. per foot provision for nailing is made.

Note: Specifications for use in the eleven western states are different from above, and can be obtained from offices of PIONEER-FLINTKOTE COMPANY (see page 2 for addresses, etc.). No bonds are issued in Pacific Coast area. Slag or gravel surfaced roofs are recommended for use in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma as we will not bond smooth surfaced asphalt roofs in that area.

†Subject to change without notice.

Architects' Condensed Specifications

BUILT-UP ROOFING OVER WOOD OR PRECAST GYPSUM DECKS

SPECIFICATION A-3-W (BOND: 20 YEARS)

Type—Slag or Gravel Surface Viskalt Saturated Felts, Asphalt.
Deck—Wood (or precast gypsum).
Incline—¼-in. up to 3-in. per foot.
Classification—Underwriters' "A."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification A-3-W applied as follows subject to the Flintkote detailed specification. Apply a Flintkote 30-lb. Viskalt Saturated Felt (or two layers of 15-lb. Viskalt Saturated Felt lapped 19 in.) laid dry and nailed. Over this base apply three layers of 15-lb. Viskalt Saturated Felt in shingle construction lapped 24¾ in. and solidly cemented with Flintkote Roofing Asphalt. Coat surface with a heavy pouring of Flintkote Roofing Asphalt and embed 400 lbs. of gravel or 300 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 20 years.

SPECIFICATION A-4-W (BOND: 20 YEARS)

Type—Slag or Gravel Surface Tarred Felts, Rex Blended Pitch.
Deck—Wood (or precast gypsum).
Incline—¼-in. up to 2-in. per foot.
Classification—Underwriters' "A."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification A-4-W applied as follows subject to Flintkote detailed specification. Apply one layer of sheathing paper and over this apply two layers of Flintkote 15-lb. Tarred Felt laid dry in shingle construction, lapped 17 in. and nailed. Over these dry felts apply three additional layers of 15-lb. Tarred Felts in shingle construction, lapped 22 in. and solidly cemented with Flintkote Rex Blended Pitch. Coat surface with a heavy pouring of Flintkote Rex Blended Pitch and embed 400 lbs. of gravel or 300 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 20 years.

SPECIFICATION B-3-W (BOND: 15 YEARS)

Type—Slag or Gravel Surface Viskalt Saturated Felts, Asphalt.
Deck—Wood (or precast gypsum).
Incline—¼-in. up to 3-in. per foot.
Classification—Underwriters' "A."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification B-3-W applied as follows subject to the Flintkote detailed specification. Apply a Flintkote 30-lb. Viskalt Saturated Base Felt (or two layers of 15-lb. Viskalt Saturated Felt, lapped 19 in.) laid dry and nailed. Over this base apply two layers of 15-lb. Viskalt Saturated Felt in shingle construction, lapped 19 in., and solidly cemented with Flintkote Roofing Asphalt. Coat surface with a heavy pouring of Flintkote Roofing Asphalt and embed 400 lbs. of gravel or 300 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 15 years.

SPECIFICATION B-4-W (BOND: 15 YEARS)

Type—Slag or Gravel Surface Tarred Felts, Rex Blended Pitch.
Deck—Wood (or precast gypsum).
Incline—¼-in. up to 2-in. per foot.
Classification—Underwriters' "A."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification B-4-W applied as follows subject to the Flintkote detailed specification. Apply one layer of sheathing paper and over this apply two layers of 15-lb. Tarred Felts laid dry in shingle construction, lapped 17 in. and nailed. Over these dry felts apply two additional layers of 15-lb. Tarred Felts in shingle construction, lapped 17 in., and solidly cemented with Flintkote Rex Blended Pitch. Coat surface with a heavy pouring of Flintkote Rex Blended Pitch and embed 400 lbs. of gravel or 300 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 15 years.

SPECIFICATION B-2-W (BOND: 15 YEARS)

Type—Mineral surfaced Rex Construction, Viskalt Saturated Felts, Flintkote Roofing Asphalt.
Deck—Wood (or precast gypsum).
Incline—3 in. up to 9 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification B-2-W applied as follows subject to the Flintkote detailed specification. Apply one layer of 15-lb. Viskalt Saturated Felt laid dry and nailed. Over this felt apply two additional layers of 15-lb. Viskalt Saturated Felt lapped, 19 in. and cemented solidly to the first felt and to each other with Flintkote Roofing Asphalt. Over these felts apply Rex Construction Roofing in two layers, solidly cemented to each other with Flintkote Roofing Asphalt.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 15 years.

SPECIFICATION C-3-W-S (BOND: 10 YEARS)

Type—Slag or Gravel Surface Viskalt Saturated Felts, Flintkote Roofing Asphalt.
Deck—Wood (or precast gypsum).
Incline—3 in. up to 6 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-3-W-S applied as follows subject to the Flintkote detailed specification. Apply five layers of 15-lb. Viskalt Saturated Felts in shingle construction, lapped 29¼ in., nailed as specified, and cemented solidly between laps for a distance of 25 in. with Flintkote Roofing Asphalt. Coat surface with a heavy pouring of Flintkote Roofing Asphalt and embed 325 lbs. of gravel or 250 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.
Note: A similar type of specification is available for 20-year bond period.

SPECIFICATION C-1-W-C (BOND: 10 YEARS)

Type—Smooth Surface 34-lb. Flintkote Cap Sheet, Viskalt Saturated Felts, Flintkote Roofing Asphalt.
Deck—Wood (or precast gypsum).
Incline—¾ in. up to 3 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-1-W-C applied as follows subject to the Flintkote detailed specification. Apply one layer of Flintkote 35-lb. base sheet laid dry and nailed. Over this felt apply two layers of 15-lb. Viskalt Saturated Felts, lapped 19 in., and solidly cemented with Flintkote Roofing Asphalt. Over these felts apply one layer of Flintkote 34-lb. Cap Sheet, lapped 6 in., and solidly cemented with Flintkote Roofing Asphalt.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.
Note: Bond on this specification not issued in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma.

SPECIFICATION C-2-W (BOND: 10 YEARS)

Type—Mineral Surfaced Rex Construction, Viskalt Saturated Felts, Flintkote Roofing Asphalt.
Deck—Wood (or precast gypsum).
Incline—3 in. up to 9 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-2-W applied as follows subject to the Flintkote detailed specification. Apply two layers of 15-lb. Viskalt Saturated Felts laid dry, lapped 19 in., and nailed. Over these felts apply Rex Construction Roofing in two layers solidly cemented with Flintkote Roofing Asphalt.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.

SPECIFICATION C-1-W (BOND: 10 YEARS)

Type—Smooth Surfaced Viskalt Saturated Felts, Flintkote Viskalt Roofing Compound.
Deck—Wood (or precast gypsum).
Incline—¾ in. up to 3 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-1-W applied as follows subject to the Flintkote detailed specification. Apply a Flintkote 30-lb. Viskalt Saturated Base Felt laid dry and nailed. Over this base apply two layers of 15-lb. Viskalt Saturated Felts in shingle construction; lapped 19 in., and solidly cemented with Flintkote Viskalt Roofing Compound. Felts shall be surfaced with a heavy coating of Viskalt Roofing Compound.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.
Note: Bond on this specification not issued in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma.

SPECIFICATON C-1-W-E (BOND: 10 YEARS)

Type—Smooth Surfaced, Viskalt Saturated Felts, Flintkote Roofing Asphalt, top surfaced with Static Roof Coating.
Deck—Wood (or precast gypsum).
Incline—¾ in. up to 3 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-1-W-E applied as follows subject to the Flintkote detailed specification. Apply a Flintkote 30-lb. Viskalt Saturated Felt laid dry and nailed. Over this base apply two layers of 15-lb. Viskalt Saturated Felt in shingle construction, lapped 19 in., and solidly cemented with Flintkote Roofing Asphalt. Felt shall be surfaced with Static Roof Coating (Fibrated) three gallons per 100 sq. ft.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.
Note: Bond on this specification not issued in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma.

BUILT-UP ROOFING — NON-COMBUSTIBLE DECKS

SPECIFICATION A-3-C (BOND: 20 YEARS)

Type—Slag or Gravel Surface Viskalt Saturated Felts, Asphalt.
Deck—Non-combustible (poured or precast concrete, poured gypsum or book tile).
Incline—From 1/4 in. up to 3 in. per foot (wood nailing strips on 4-ft. centers required on inclines over 2 in. per foot unless surface of deck allows nailing).
Classification—Underwriters' "A."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification A-3-C applied as follows subject to the Flintkote detailed specification. (Where deck is of gypsum, prime surface with asphalt primer.) Apply four layers of 15-lb. Flintkote Viskalt Saturated Felts laid in shingle construction, lapped 27½ in., and solidly cemented with Roofing Asphalt. Coat surface with heavy pouring of Flintkote Roofing Asphalt and embed 400 lbs. of gravel or 300 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 20 years.

SPECIFICATION A-4-C (BOND: 20 YEARS)

Type—Slag or Gravel Surface Tarred Felts, Rex Blended Pitch.
Deck—Non-combustible (poured or precast concrete, poured gypsum or book tile).
Incline—From 1/4 in. up to 1 in. per foot on poured or precast concrete or book tile; from 1/4 in. up to 2 in. per foot on poured gypsum.
Classification—Underwriters' "A."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification A-4-C applied as follows subject to the Flintkote detailed specification. Apply four layers of Flintkote 15-lb. Tarred Felts in shingle construction, lapped 24½ in., and solidly cemented with Flintkote Rex Blended Pitch. Coat surface with heavy pouring of Flintkote Rex Blended Pitch and embed 400 lbs. of gravel or 300 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 20 years.

SPECIFICATION B-3-C (BOND: 15 YEARS)

Type—Slag or Gravel Surface Viskalt Saturated Felts, Asphalt.
Deck—Non-combustible (poured or precast concrete, poured gypsum or book tile).
Incline—From 1/4 in. up to 3 in. per foot (wood nailing strips on 4-ft. centers required on inclines over 2 in. per foot unless surface of deck allows nailing).
Classification—Underwriters' "A."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification B-3-C laid as follows subject to the Flintkote detailed specification. (Where deck is of gypsum prime surface with asphalt primer.) Apply three layers of 15-lb. Flintkote Viskalt Saturated Felts in shingle construction, lapped 24¾ in., and solidly cemented with Flintkote Roofing Asphalt. Coat surface with heavy pouring of Flintkote Roofing Asphalt and embed 400 lbs. of gravel or 300 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 15 years.

SPECIFICATION B-4-C (BOND: 15 YEARS)

Type—Slag or Gravel Surfaced Tarred Felts, Rex Blended Pitch.
Deck—Non-combustible (poured or precast concrete, poured gypsum or book tile).
Incline—From 1/4 in. up to 1 in. per foot on poured or precast concrete or book tile; from 1/4 in. up to 2 in. per foot on poured gypsum.
Classification—Underwriters' "A."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification B-4-C laid as follows subject to the Flintkote detailed specification. Apply three layers of Flintkote 15-lb. Tarred Felts in shingle construction, lapped 22 in., and solidly cemented with Flintkote Rex Blended Pitch. Coat surface with heavy pouring of Flintkote Rex Blended Pitch and embed 400 lbs. of gravel or 300 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 15 years.

SPECIFICATION B-2-C (BOND: 15 YEARS)

Type—Mineral Surfaced Rex Construction, Viskalt Saturated Felts, Flintkote Roofing Asphalt.
Deck—Non-combustible (poured concrete or poured gypsum).
Incline—3 in. up to 9 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification B-2-C laid as follows subject to the Flintkote detailed specification. Prime the deck with Flintkote Asphalt Primer. Apply two layers of 15-lb. Viskalt Saturated Felt lapped 19 in. and solidly cemented in Flintkote Roofing Asphalt. Over these felts apply Rex Construction Roofing in two layers, solidly cemented to each other with Flintkote Roofing Asphalt.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 15 years.

SPECIFICATION C-3-C-S (BOND: 10 YEARS)

Type—Slag or Gravel Surface Viskalt Saturated Felts, Flintkote Roofing Asphalt.
Deck—Non-combustible.
Incline—3 in. up to 6 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-3-C-S laid as follows subject to the Flintkote detailed specification. Prime the deck with Flintkote Asphalt Primer and apply four layers of 15-lb. Viskalt Saturated Felt, lapped 27½ in., solidly cemented with Flintkote Roofing Asphalt. Coat surface with a heavy pouring of Flintkote Roofing Asphalt and embed with 325 lbs. of gravel or 250 lbs. of slag.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.
Note: A similar type of specification is available for 20-year bond period.

SPECIFICATION C-1-C-C (BOND: 10 YEARS)

Type—Smooth Surfaced Cap Sheet, Viskalt Saturated Felts, Flintkote Roofing Asphalt.
Deck—Non-combustible.
Incline—¾ in. up to 3 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-1-C-C laid as follows subject to the Flintkote detailed specification. Prime the deck with Flintkote Asphalt Primer. Apply three layers of 15-lb. Viskalt Saturated Felts lapped 24¾ in. and solidly cemented with Flintkote Roofing Asphalt. Over these felts apply one layer of Flintkote 34-lb. Cap Sheet lapped 6 in. and cemented solidly with Flintkote Roofing Asphalt.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.
Note: Bond on this specification not issued in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma.

SPECIFICATION C-2-C (BOND: 10 YEARS)

Type—Mineral Surfaced Rex Construction, Viskalt Saturated Felts, Flintkote Roofing Asphalt.
Deck—Non-combustible (poured concrete or poured gypsum).
Incline—3 in. up to 9 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-2-C laid as follows subject to the Flintkote detailed specification. Prime the deck with Flintkote Asphalt Primer. Apply one layer of 15-lb. Viskalt Saturated Felt solidly cemented with Flintkote Roofing Asphalt. Over this felt apply Rex Construction roofing in two layers solidly cemented with Flintkote Roofing Asphalt.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.

SPECIFICATION C-1-C (BOND: 10 YEARS)

Type—Smooth Surfaced Viskalt Saturated Felt and Flintkote Roofing Asphalt.
Deck—Non-combustible (poured or precast concrete, poured gypsum or book-tile).
Incline—From ¾ in. up to 3 in. per foot.
Classification—Underwriters' "C."
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-1-C applied as follows subject to the Flintkote detailed specification. Prime the deck with Flintkote Asphalt Primer. Apply three layers of 15-lb. Viskalt Saturated Felts in shingle construction, lapped 24¾ in., and solidly cemented with Flintkote Viskalt Roofing Compound. Felts shall be surfaced with Viskalt Roofing Compound.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.
Note: Bond on this specification not issued in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma.

SPECIFICATION C-1-C-E (BOND: 10 YEARS)

Type—Smooth Surfaced Viskalt Saturated Felt and Flintkote Roofing Asphalt, top surfaced with Static Roof Coating.
Deck—Non-combustible (poured or precast concrete, poured gypsum or book tile).
Incline—¾ in. up to 3 in. per foot.
Classification—Underwriters' "C".
Insert Under "Roofing"—Built-up Roofing shall be a Flintkote Specification C-1-C-E applied as follows subject to the Flintkote detailed specification. Prime the deck with Flintkote Asphalt Primer. Apply one layer of 30-lb. Viskalt Saturated Felt cemented solidly with Flintkote Roofing Asphalt. Over this base apply two layers of 15-lb. Viskalt Saturated Felt in shingle construction, lapped 19 in. and solidly cemented with Flintkote Roofing Asphalt. Felt shall be surfaced with Static Roof Coating (Fibrated) three gallons per 100 sq. ft.
Flashing—A Flintkote standard flashing shall be used.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.
Note: Bond on this specification not issued in or south of the states of South Carolina, Georgia, Tennessee, Arkansas and Oklahoma.

BUILT-UP ROOFING UNDER PROMENADE TILE

SPECIFICATION C-1-P (BOND: 10 YEARS)

Type—Viskalt Saturated Felts and Flintkote Roofing Asphalt.
Deck—Concrete.
Incline—Not over 1 in. per foot.
Insert Under "Roofing"—Built-up Roofing under Promenade Tile shall be a Flintkote Specification C-1-P applied as follows subject to the Flintkote detailed specification. Apply five layers of Flintkote 15-lb. Viskalt Saturated Felts in two, two, and one ply construction, solidly cemented with Flintkote Roofing Asphalt and surfaced with a heavy coating of Flintkote Roofing Asphalt.
Flashing—Copper Cap and Base Flashing shall be used, reinforced with three plies of 15-lb. Viskalt Saturated Felts cemented solidly with Flintkote Roofing Asphalt.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.

SPECIFICATION C-4-P (BOND: 10 YEARS)

Type—Tarred Felts and Rex Blended Pitch.
Deck—Concrete.
Incline—Not over 1 in. per foot.
Insert Under "Roofing"—Built-up Roofing under Promenade Tile shall be a Flintkote Specification C-4-P applied as follows subject to the Flintkote detailed specification. Apply five layers of Flintkote 15-lb. Tarred Felt in two, two and one ply construction, solidly cemented with Flintkote Rex Blended Pitch and surfaced with a heavy coating of Rex Blended Pitch.
Flashing—Copper Cap and Base Flashing shall be used, reinforced with three plies of 15-lb. Viskalt Saturated Felts solidly cemented with Flintkote Roofing Asphalt.
Bond—Manufacturers' bond on roofing shall be furnished for a period of 10 years.

RECOMMENDATIONS WHERE INSULATION IS USED

Insulation Used Under Pitch and Gravel Roofs—Over Wood Decks—*Normal Conditions*—Apply two layers of 6-lb. rosin sheathing paper over wood deck. Nail insulation into wood deck. Over insulation apply respective specification as over non-combustible decks.

Humid Conditions in the Building Itself—Before application of insulation apply one layer of sheathing paper and two layers of 15-lb. tarred felts laid dry and nailed. Apply insulation mopped solid in pitch and over insulation apply respective specification as over non-combustible decks, mopping all felts solidly to insulation. Where more than one layer of insulation is used each successive layer shall be mopped solidly with pitch to the preceding layer. Where incline is over 3 in. per foot insulation should also be nailed into deck.

Insulation Used Under Asphalt Types of Roofs—Over Wood Decks—*Normal Conditions*—Apply two layers of 6-lb. sheathing paper laid dry. Nail insulation into deck and over insulation apply respective specifications as over non-combustible deck, mopping all felts solidly to insulation.

Humid Conditions in the Building Itself—Before application of insulation apply two layers of 15-lb. felt laid dry, lapped 19 in. Apply insulation mopped solid in asphalt and over insulation apply respective specification as over non-combustible decks, mopping all felts solidly to insulation. Where more than one layer of insulation is used each successive layer shall be mopped solidly with asphalt to the preceding layer. Where incline is over 3 in. per foot insulation should also be nailed into deck.

Insulation Used Under Asphalt or Pitch and Gravel Roofs—Over Non-combustible Decks—*Normal Conditions*—Insulation shall be solidly cemented to deck which has previously been primed and on inclines over 3 in. per foot nailing should be provided. Where more than one layer of insulation is used, each successive layer shall be cemented solidly with asphalt to the preceding layer if an asphalt specification is used (or with pitch if a pitch and gravel specification is used). Over insulation apply respective specification as over non-combustible decks, mopping all felts solidly to insulation.

Humid Conditions in the Building Itself—Over the primed deck apply a heavy mopping of roofing asphalt (or pitch) and embed two layers of 15-lb. felt solidly cemented with asphalt if an asphalt specification is used (or with pitch if a pitch and gravel specification is used). On inclines of 3 in. per foot, nailing should be provided. Where more than one layer is used, each successive layer should be cemented solidly with asphalt or pitch to the preceding layer. Over insulation apply respective specification as over non-combustible decks, mopping all felts solidly to insulation.

REQUIREMENTS WHERE STEEL DECKS ARE USED

All steel decks shall be primed with asphalt primer if not provided with a shop coat and shall be covered with at least one ply of rigid insulation mopped solid with roofing asphalt. Over insulation apply the respective specification as over non-combustible decks. Where incline is over 3 in. per foot, means of fastening insulation to steel decks should be provided.

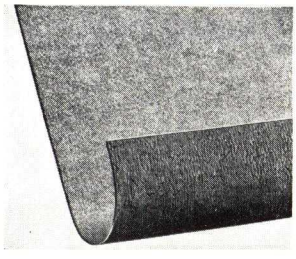
FLINTKOTE ROLL ROOFINGS

Flintkote Roll Roofings are available either with mineral surfacing or smooth surface. Both types of roofing are made on heavy felts that have been saturated with a special asphalt, coated on both sides with coating asphalt and surfaced either with colored granules or with talc or mica. A special corrugated surface on smooth-surface roofings is also available. Roll roofings of this type are primarily intended for use on farm buildings, sheds, industrial plants and other types of buildings where a low cost roofing is required.

DATA ON FLINTKOTE MINERAL SURFACED ROOFING*

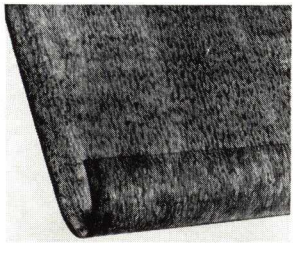
Av. wt. roll, lb.	Approx. sq. ft. per roll	Approx. width roll, in.	Underwriters label, class	Colors
75	108	36		Green, Red, Blue-black and Clover Green
90	108	36	C	Green, Red, Clover Green and Tile Red, Blue-Black.

"REX FLINTKOTE"



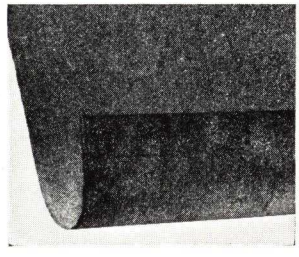
"Rex Flintkote" is a smooth Roll Roofing of the highest quality material surfaced with "Rayflex" finish on one side and corrugated mica finish on the other. Nails and cement furnished (see table).

FLINTKOTE "STALWART"



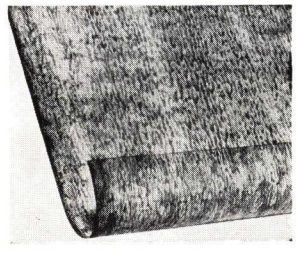
Flintkote "Stalwart" is a smooth Roll Roofing that meets government and railroad specifications. Gunmetal corrugated finish on both sides (see table).

FLINTKOTE "RELIANCE"



Flintkote "Reliance" is a smooth Roll Roofing surfaced with mica on both sides (see table).

FLINTKOTE "GUARDIAN"



Flintkote "Guardian" is a moderately priced smooth Roll Roofing, corrugated with talc finish both sides. Most suitable where permanency is not paramount (see table).

DATA ON FLINTKOTE SMOOTH SURFACE ROLL ROOFING*

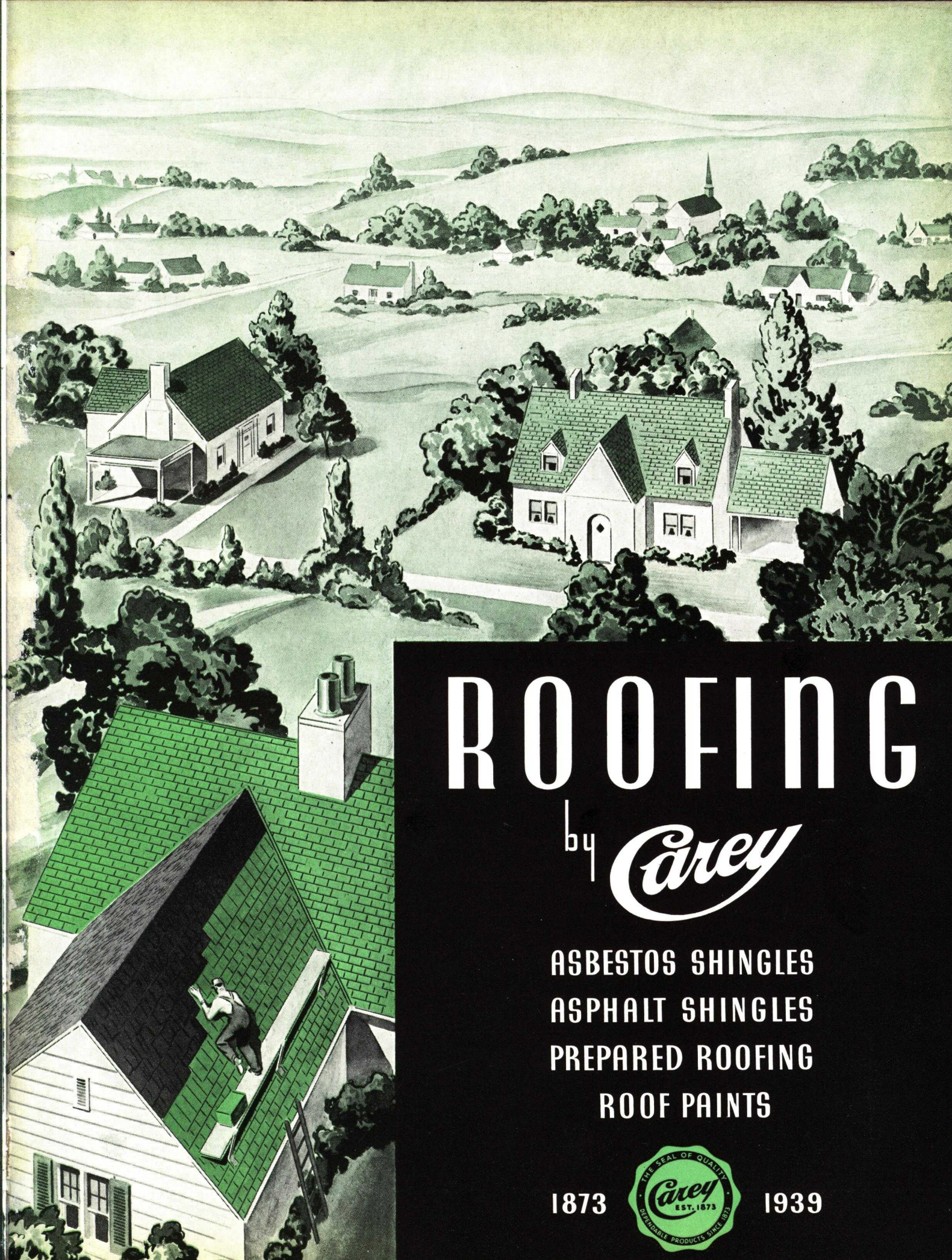
Rex Flintkote				Stalwart				Reliance				Guardian			
Av. wt. per roll, lb.	Approx. sq. ft. per roll	Approx. width of roll, in.	Underwriters' label, class	Av. wt. per roll, lb.	Approx. sq. ft. per roll	Approx. width of roll, in.	Underwriters' label, class	Av. wt. per roll, lb.	Approx. sq. ft. per roll	Approx. width of roll, in.	Underwriters' label, class	Av. wt. per roll, lb.	Approx. sq. ft. per roll	Approx. width of roll, in.	Underwriters' label, class
55	108	36	C	45	108	36	C	45	108	36	..	35	108	36	..
65	108	36	C	55	108	36	C	55	108	36	C	45	108	36	..
75	108	36	C	65	108	36	C	65	108	36	C	55	108	36	..
..	..	..	..	..	..	..	..	75	108	36	C	..	..	..	..

*Subject to change without notice.

COLOR CHART OF FLINTKOTE ASPHALT SHINGLES

To simplify the presentation of the numerous colors and blends in which Flintkote Asphalt Shingles are available, four basic plain colors and four basic blends are reproduced herewith. Each panel is numbered in its lower left corner. These numbers are keyed to the tabulated information presented on page three of this catalog. Please refer to page three for detailed color specifications of Flintkote Asphalt Shingles.

Note: These colors are as faithful as can be obtained by modern printing. Some variations are to be expected because of reproduction limitations and slight differences in the manufacturing processes of the various products.



ROOFING

by Carey

ASBESTOS SHINGLES
ASPHALT SHINGLES
PREPARED ROOFING
ROOF PAINTS

1873 1939

THERE'S A Carey ROOF FOR EVERY BUILDING

6/14

The Philip Carey Company through more than sixty years of experience in the manufacture and application of roofing materials and accessories has developed a complete line of roofs.

From the smallest temporary shed to the finest type of permanent construction there is a Carey Roof to meet your exact requirements. In this book are described the various types, weights and finishes of Carey Prepared Roofing materials, including:

SELECTION TABLE

GROUP	SHAPE	NAME	Sizes, In.	Exposure, In.	Head-lap, In.	Weight per sq., lb.	Under-writers' Label	Page
Careystone ASBESTOS-CEMENT SHINGLES	(A) (B) (C) (D)	(A) Scotch-American No. 20	12 x24	9x20	3	260	Class "B"	4
		(B) Shakes No. 38	16 x16	7	9	465	Class "A"	5
		(C) Scotch No. 30	16x16x 3/16	12x13	4	290	Class "B"	5
		(D) French No. 70	16x16x 5/32	13	3	260	Class "B"	5
Careystone ASBESTOS-CEMENT SIDING	(E) (F) (G)	(E) Old Colony Duo Edge—No. 210	12 x24	10½x24	1½	180		6
		(F) Duo "8"—No. 220	9½x24	8x24	1½	190		7
		(G) Colonial Clapboards	3/16x9x96	7	2	240		7
ASPHALT INDIVIDUAL SHINGLES *Plain Back †Cork Back	(H) (I) (J)	(H) Asfaltslate	12 x16	5	6	325* 345†	Class "C"	12
			9 x12¾	4	4¾	253	Class "C"	12
		(I) Careylok (Standard)	12 x16	10	2	130*	Class "C"	13
		(I) Careylok (Extra Heavy)	12 x16	10	2	162* 172†	Class "C"	13
		(J) Careylok (Hexagonal)	16 x16		2½	130* 140†	Class "C"	13
ASPHALT STRIP SHINGLES *Plain Back †Cork Back	(K) (L) (M)	(K) 2 Tab, Hexagonal	11⅓x36	4⅔	2	167* 177†	Class "C"	15
			12⅓x36	4⅔	3	186*	Class "C"	15
			14½x36	4⅔	5⅙	225*	Class "C"	15
		(L) 3 Tab, Square Butt	12 x36	5	2	210* 215†	Class "C"	16
			15 x36	5	5	270†	Class "C"	16
		(M) 4 Tab, Square Butt	10 x36	4	2	210*	Class "C"	16
			12½x36	4	4½	266*	Class "C"	16

PREPARED ROLL ROOFING.....PAGES 17, 18

BUILDING PAPERS, FELTS AND CAP SHEETS .....PAGE 19

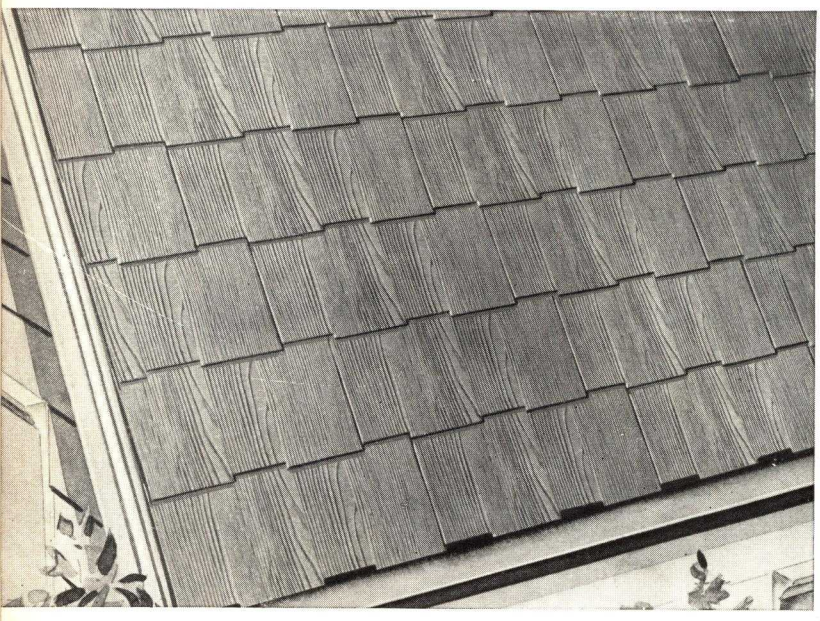
CAREYSTONE SHINGLES, with the exception of the French method, have the appearance of attractive wood shingles. The texture is an effective reproduction of wood grain set in everlasting Portland Cement and asbestos fibre. By a scientific process, selected Portland Cement is reinforced with everlasting asbestos fibres and combined under great pressure into a permanent shingle possessing natural properties that enable it to resist the destructive influence of time, and in addition, possess that peculiar property of increasing in toughness and strength upon exposure to the elements. They never require painting or other upkeep expense, and will last as long as the home upon which they are applied. Careystone Asbestos-Cement Shingles are made in both roofing and siding units. Popular colors meet every demand of architecture or personal taste.

Careystone

ASBESTOS CEMENT SHINGLES and SIDING

Careystone SHINGLES

SCOTCH AMERICAN No. 20



Most recent of the Careystone Asbestos Shingles is the new Scotch-American. The applied cost of this shingle is approximately that of the French Method — hitherto the lowest priced asbestos shingle — yet, it gives the effect of a high priced individual shingle laid in the most expensive manner — random widths and staggered butts.

Attractive appearance combined with the low cost of the Scotch-American Shingle extends the use of this fire-proof, maintenance-free Careystone roof to all buildings.

With one-third less exposure than the old style Scotch or Dutch Lap unit, this shingle is even more weatherproof, and has many more appealing shadow lines.

Size: 12 x 24 in. Exposure 9 x 20 in., 80 pieces (4 bundles) per square.

Colors: French Gray, Solid Black, Weathered Brown, Forest Green.

Required: 160 Needle Point Nails, 80 copper anchors per square.

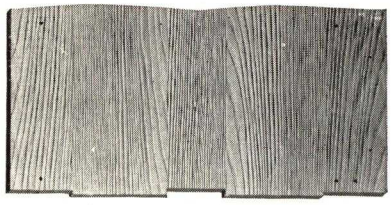
Weight: Approximately 260 lbs. per square.

Underwriters' Label Class B

Reversible: Careystone Scotch-American Shingles are reversible, and can be applied with the curved edge exposed to secure a most unique thatched effect.

The two illustrations show the two interesting treatments possible with Careystone Scotch-American Shingles. With either the Staggered Butt or the Wave Thatched Exposure a most attractive roof, with the appearance of authentic wood shingles but with the long life of asbestos shingles, is the result.

Showing Thatch Butt Exposed



Showing Wave Line Exposed

Packaged in special carton — completely protected to insure shingles arriving on job in perfect condition.

Apply Careystone Shingles over Carey 15 or 30-lb. Feltex or Carey Roll Roofing.

Careystone SHINGLES
FIREPROOF and PERMANENT

CAREYSTONE SHAKES (Duplex) No. 38

This unique development embodies two Tapered American Method Shingles in one piece, thus reducing the labor of application almost half. At the same time showing broad shadow lines both at the butt and on the sides, bringing into bold relief the individual shingle. The accompanying illustration shows a random width and staggered butt design of utmost architectural appeal which is achieved without the usual application difficulties. They are self-spacing and self-aligning. *Conventional design also available.**

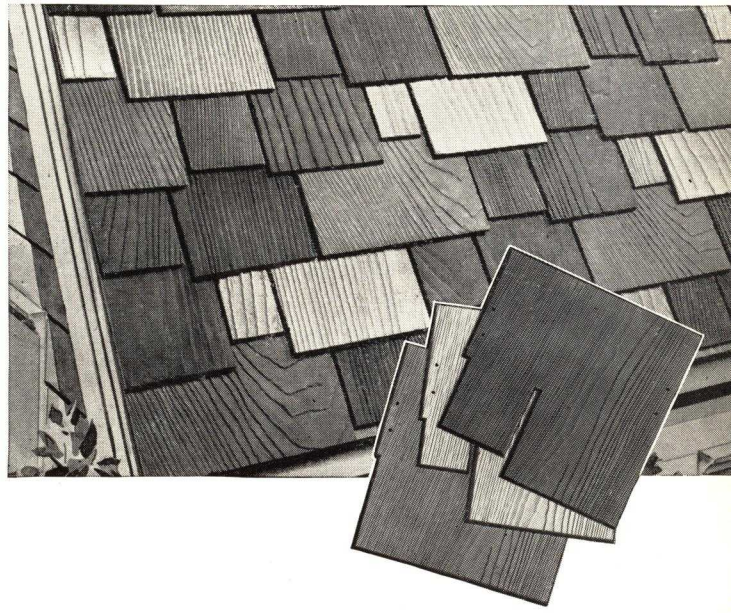
Size: 16 x 16 in. overall — tapered to approx. ¼-in. butt. **130 pieces** (10 bdls.) per square. Exposure approx. 7 in. Require: 260 Needle Point Nails per square.

Colors: Windsor Gray, Bowling Green Blend (variegated cool greens and gray), Fall Blend (warm tones of red, brown and gray) and Black.

*Conventional design furnished in Gray, Red, Brown, Black and Forest Green.

Weight: Approximately 460 lbs. per square.

Underwriters' Label Class A.



SCOTCH METHOD No. 30

Careystone Scotch Method Shingles make a desirable and artistic roof for homes where the element of cost is an important factor. They have the texture and appearance of American Method Shingles, though the cost is but slightly more than for the French Method.

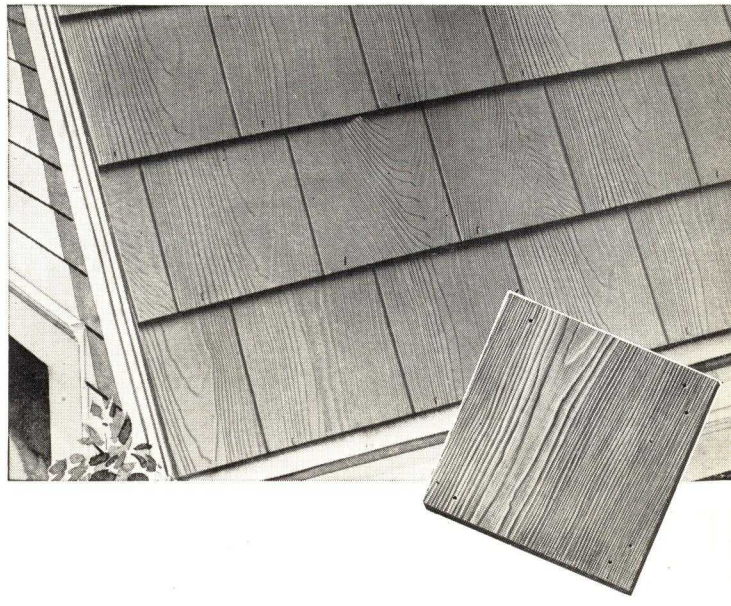
Size: 16 x 16 x 3/16 ins. *92 shingles (6 2/15 bdls.) per square. Exposure: 12 x 13 ins. Required: 184 Needle Point Nails and 92 Copper Storm Nails per square. *Actual coverage 99 2/3 square feet.

Note: Also applied with 5 1/3 in. side lap requiring 104 shingles per square.

Colors: Windsor Gray, Georgian Red, Solid Black, Mottled, Bristol Green.

Weight: Approximately 290 lbs. per square.

Underwriters' Label Class B.



FRENCH METHOD No. 70

French Method Shingles are made of Careystone Asbestos and Cement. Their smooth stone-like surface combines beauty, protection and permanent service at low cost.

Size: 16 x 16 x 5/32 in. Smooth Finish. 3 in. Headlap. 86 shingles (5 6/16 bundles) per square.

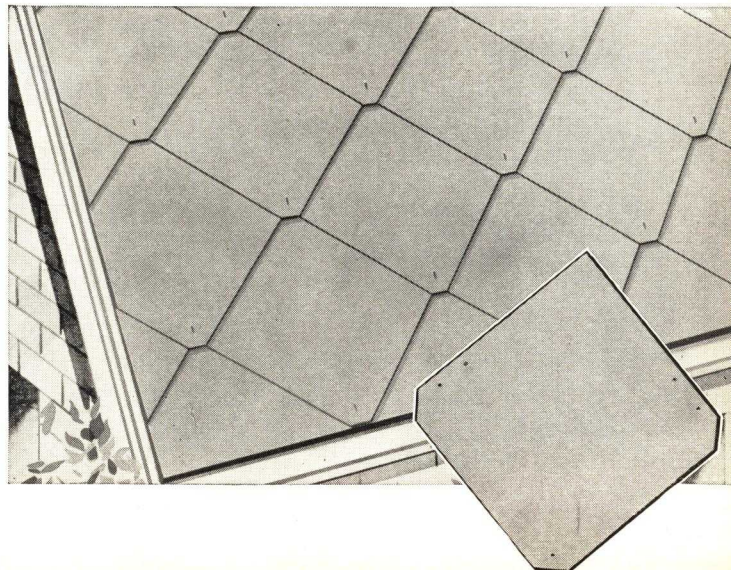
Required: 172 Needle Point Nails and 86 Copper Storm Nails per square.

Colors: Gray, Red, Solid Black, Mottled, Green.

Weight: Approximately 260 lbs. per square.

Underwriters' Label Class B.

Apply Careystone Shingles over Carey 15 or 30-lb. Feltex or Carey Roll Roofing.



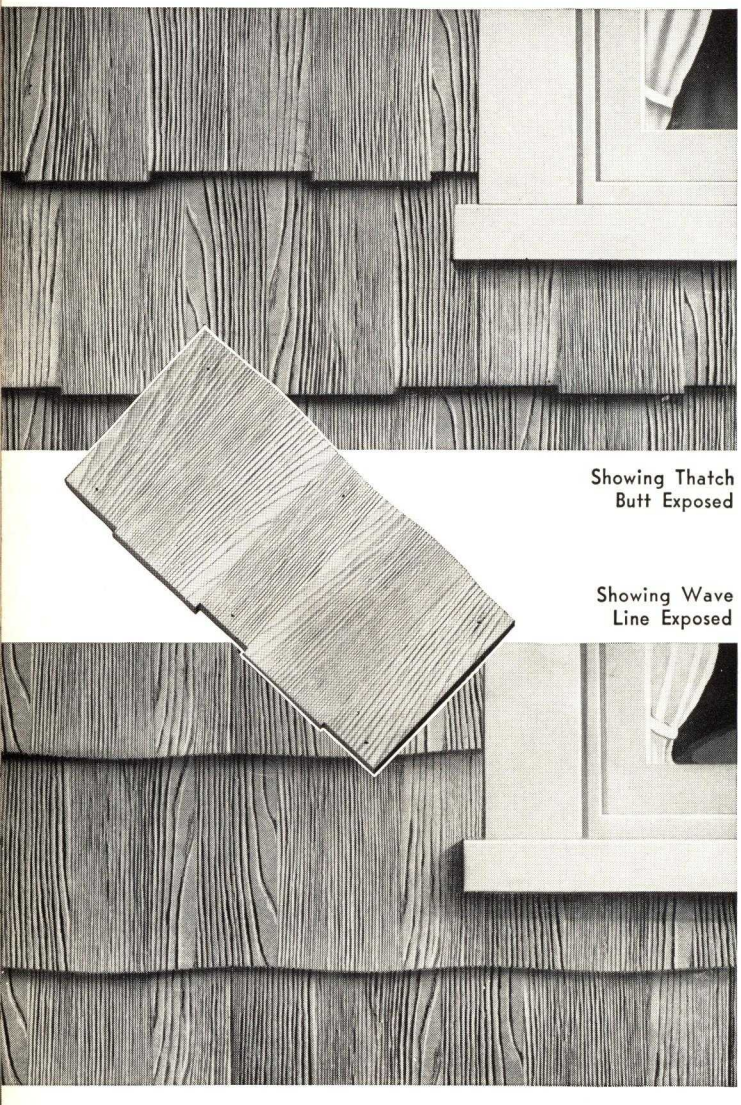
Careystone ASBESTOS — CEMENT SIDING FOR ANY STYLE HOME

6/14

AN AUTHENTIC REPRODUCTION of wood grain texture, a wide variety of patterns, choice of outstanding colors, adaptability to all types of architecture through various widths of exposure, plus complete freedom from maintenance expense are just a few of the many desirable features found in the new line of Careystone Siding that makes it worthy of your consideration as a sidewall material in the construction of new homes.

THE 15 IMPORTANT FEATURES

1. Low First Cost
2. Distinctive and Beautiful Appearance
3. No Up-Keep Expense
4. No Painting Required
5. Fire-proof
6. Adaptability of Design
7. "Wood Grain Texture"
8. Variety of Patterns
9. Warmer in Winter
10. Cooler in Summer
11. Will Not Rot
12. Will Not Deteriorate
13. Will Not Curl
14. Termite Proof
15. Enhanced Value



Showing Thatch Butt Exposed

Showing Wave Line Exposed

OLD COLONY DUO-EDGE No. 210

Old Colony Siding meets the demand for a side wall material that combines the charm of individual wood shingles with the fire-proof maintenance-free qualities of Asbestos and Portland Cement. This new Careystone Siding Unit is so designed that when laid with one edge exposed it gives the attractive broken lines of thatch butt shingles laid in random widths.

The effect of individual shingles laid with staggered butts and random widths is secured through careful selection and arrangement of adjacent panels of contrasting wood grain texture on each unit.

By exposing the other edge a very pleasing wave line appearance is secured.

A unique treatment can be obtained by using both the wave line and thatch butt exposures on the same building. This multiple design feature offers a wide freedom of choice in securing individual effects.

Size: 12 x 24 ins. Exposure: 10½ x 24 ins. 57 pieces (three bundles) per square. Either edge — wave line or thatch butt — can be exposed.

Weight: Approximately 180 lbs. per square.

Colors: French Gray, Weathered Brown, Bristol Green, Mottled and **Ducks-back White.**

All nail holes one-eighth in. diameter Maximum of 171 Headlap nails required. Should be same or similar to face nails furnished with units. Extras included: 57 pieces 4 x 12 in. smooth black backer strips and 11 oz. of special alloy face nails.

Application and insulation is considerably improved when Careystone is laid over Carey Utilizit Board.

DUO "8" • No. 220

With Careystone Duo "8" No. 220 the architect is offered almost unlimited opportunity to plan exterior wall treatments. This is another double edge unit made with thatch butt on one edge and a straight line on the other, which can be laid with either edge continually exposed or alternated. Ten or more separate and distinctive patterns can be achieved by combining this unit with the wider Old Colony Siding.

In the manufacture of Duo "8" siding, special attention has been given to the arrangement of the grain to bring out the effect of random width individual shingles in the finished job. There is hardly a home or building that cannot be enhanced by one or more of the desirable effects possible through such flexibility in application.

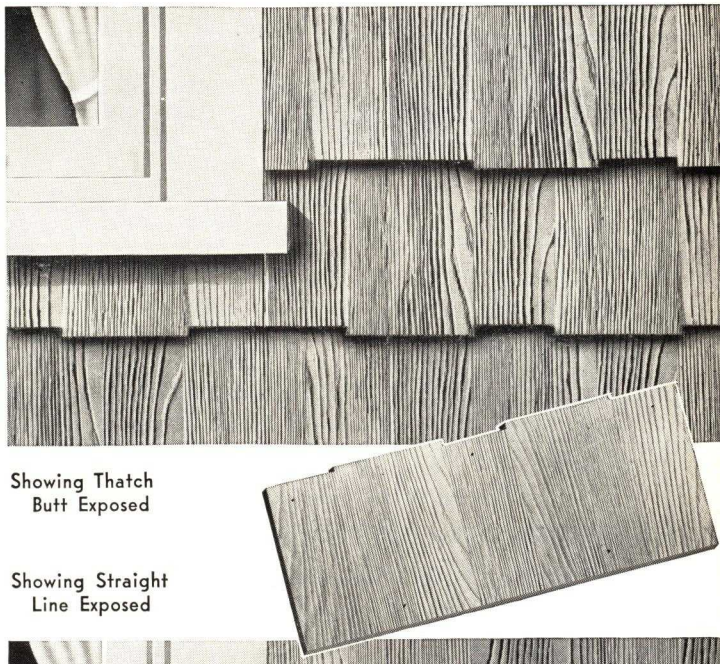
Size: 9½ x 24 ins. Exposure 8 x 24 ins. 75 pcs. (3 bdls.) per square.

Weight: Approximately 190 lbs. per square.

Color: French Gray and **Ducks-back White.**

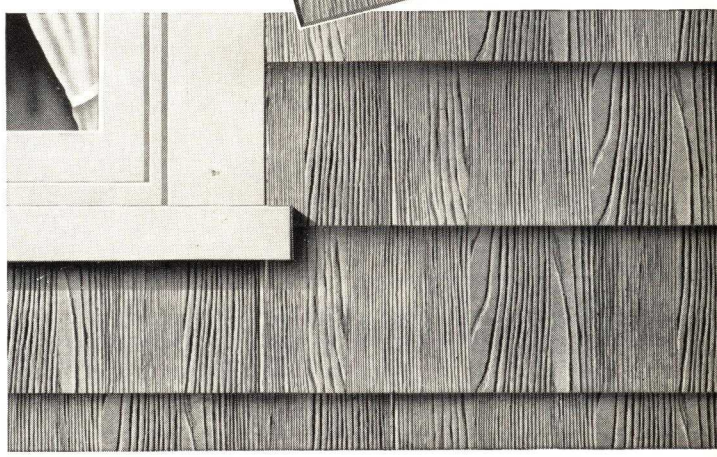
All nail holes ⅛-in. diameter. Maximum of 171 Headlap Nails required. Should be same or similar to face nails furnished with units.

Extras included: (75) 4 x 9 in. smooth black backer strips and 14 oz. special alloy face nails.



Showing Thatch Butt Exposed

Showing Straight Line Exposed



COLONIAL CLAPBOARD SIDING

Careystone Colonial Clapboard Siding is readily adaptable to almost every type of frame design. Its merit is substantiated by repeat orders for a new housing project which, upon completion, will use approximately one-half million square feet.

A pleasing contrast is achieved when Colonial Clapboard Siding is used in conjunction with other types of Careystone Siding Units whether for upper story or gable end treatments.

Size: $\frac{3}{16}$ in. x 9 in. x 8 ft. Headlap 1½ ins. Exposure 7½ in.

Weight: Approximately 240 lbs. per square.

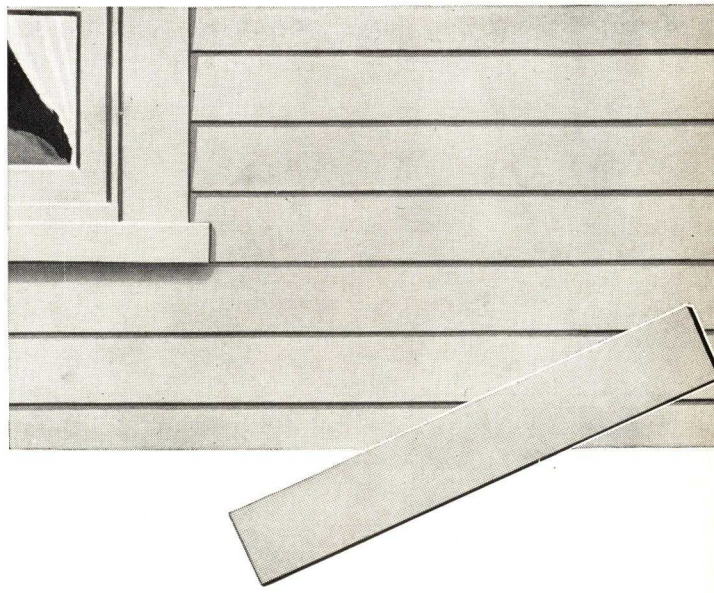
Color: **Ducks-back White** and Buff.

20 pcs. (2 closed cartons) per square. (Actual coverage 102.3 sq. ft. of surface.)

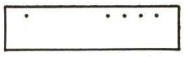
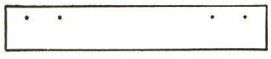
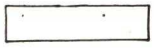
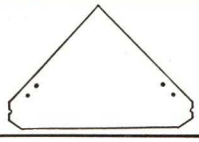
Furnished: Sufficient black backer strips and special alloy face nails.

Drilled for both head and face nailing on 16-in. centers.

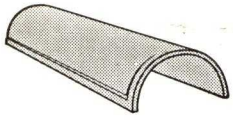
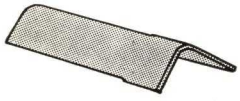
Application is considerably improved when Careystone is laid over Carey Utilizit Board.



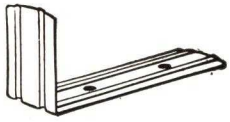
STARTERS FOR **Careystone** SHINGLES

SHAPE	STYLE	SIZES, In.	COLORS	COVERAGES (Per 100 lineal ft.)	WEIGHTS, Lbs. (Per 100 lineal ft.)
	American	8 x 16	Mixed	75 pcs. (3-15/20 bdls.)	130
	Scotch	4 x 16	Gray, Red, Brown, Black, Green	100 pcs. (5 bdls.)	90
	Scotch-American	4 x 24	Manchester Gray, Black, Bristol Green	60 pcs. (3 bdls.)	75
	French Method Eave Starter	4 x 16	Mixed	75 pcs. (3 bdls.)	60
	French Method Second Starter	20½ (wide)	Gray, Red, Mottled, Black, Green	60 pcs. (3 bdls.)	120

RIDGE SHINGLES AND ROLLS

	Hip and Ridge Shingles No. 57	5½ to 6 wide 16 long	Windsor Gray, Georgian Red, Weathered Brown, Solid Black, Bristol Green	336 Shingles (11-6/30 bdls.)	400
	Curved Ridge Roll	16-in. lengths	Windsor Gray, Georgian Red, Solid Black, Bristol Green	93 Sections	316
	Angle Ridge Roll	16-in. lengths	Windsor Gray, Georgian Red, Solid Black, Bristol Green	88 Sections	290

RIDGE ROLL FASTENERS AND NAILS



Copper Ridge Roll Fasteners
55 per lb., per 100 pieces.

Copper Storm Nails
1⅛ in. long, 195 per lb., per 100 pieces.

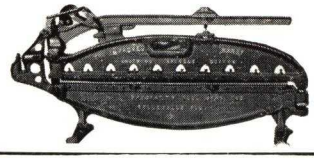
Galvanized Needlepoint Nails
1¼ in., 210 per lb.
1½ in., 195 per lb.
2 in., 175 per lb.

Copper Needle Point Nails
1¼ in., 250 per lb.
1½ in., 200 per lb.
2 in., 165 per lb.

Special Alloy Face Nails
1¼ in. long, 328 per lb.

Special Alloy Head Lap Nails
1¼ in. long, 425 per lb.

ASBESTOS SHINGLE CUTTER



27 in. Blade Asbestos Shingle Cutter — with notching attachment and punch, assembled complete. Crated weight, 50 lbs.

UTILIZIT BOARD

The ideal underlayment for Careystone Siding or Shingles, offering more than twice the protection and insulation of ordinary asphalt felts and providing a smooth, flat nailing surface, which assure the best workmanship and finished appearance to the job. Furnished in sheets, 48″ x 60″, weight 60 lbs. per 100 square feet or in cartons containing 200 square feet each.

SLATERS CEMENT

Slaters Cement — Knife or Gun Grade Consistency. Furnished in all colors to accurately match Careystone. Packed conveniently in 5-lb. cans to 300-lb. bbls.

Carey ASPHALT SHINGLES INDIVIDUAL and STRIP

CAREY ASFALTSLATE SHINGLES are noted for their long wearing qualities, their natural beauty and for their freedom from any need of painting or other servicing. They are proof against all ordinary fire risks. Asphalt Shingles, whether individual or strip are manufactured by the same process. Over a base of tough rag felt thoroughly saturated and coated with asphalt is applied a layer of colored mineral granules, providing a durable wearing surface of natural beauty in colors to appeal to individual tastes. In the final operation, individual shingles are cut singly, and strip shingles are cut in multi-units—2, 3, or 4 in one strip. The chief economy in the strip shingles is in the application cost.

CORK INSULATED SHINGLES FOR ADDED PROTECTION

Carey Cork Insulated Shingles provide a durable roof, insulated against heat or cold at a cost very little higher than that of ordinary asphalt shingles. They afford considerable economy in jobs where insulation is desired, since no extra material is necessary and there is no additional labor required. The finished roof is very pleasing in appearance with heavy shadow lines produced by the extra thickness of the shingles.

THE SEAL OF QUALITY
Carey
EST. 1873
DEPENDABLE PRODUCTS SINCE 1873

YOUR CHOICE OF HARMONIOUS

Slate Green
Asfaltslate

Tile Red
Asfaltslate

DEPENDABLE, waterproof protection will always be the first essential of a good roof.

Yet the roof must satisfy another important requirement—appearance. Because the roof is the largest single area in the house and the dominant feature of its exterior, it should be in complete harmony both with the style of architecture and the color of the building.

Today, more than ever before, outside appearance is an important factor in home value. Home buyers want a roof that emphasizes the character of the home—that gives it dignity and charm. Here, color plays a vital part.

Carey Shingle colors have been developed through years of careful study and experience in

The Emeralblend—one of the attractive blends now available in the Carey Asphalt Shingle line. The others are Red, Harvest, Russet and Green Blends and Verdeblend.

ROOF COLORS THAT ENDURE

The Careystone Scotch American Shingle. Note the natural looking wood grain and the effect of individual shingles laid in random widths with staggered butts.

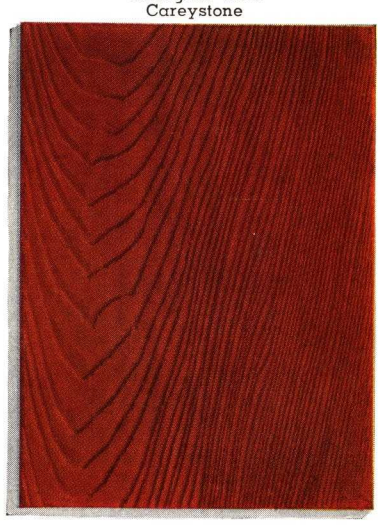
satisfying individual preferences of home owners and the rigid requirements of architects.

Carey Shingles are available in an adequate range of nature's own colors—warm reds, cool greens and beautiful blended tones, as reproduced on these pages. These colors harmonize with architecturally correct home exteriors and through combination of colors, an almost endless variety of effects may be secured, to meet the demands of any individual taste.

Carey Shingle colors are permanent. They cannot fade or wash off when exposed to the weather.

Carey will be glad to supply you with samples, so you may try them in various combinations and make sure your final selection will be right.

Georgian Red
Careystone

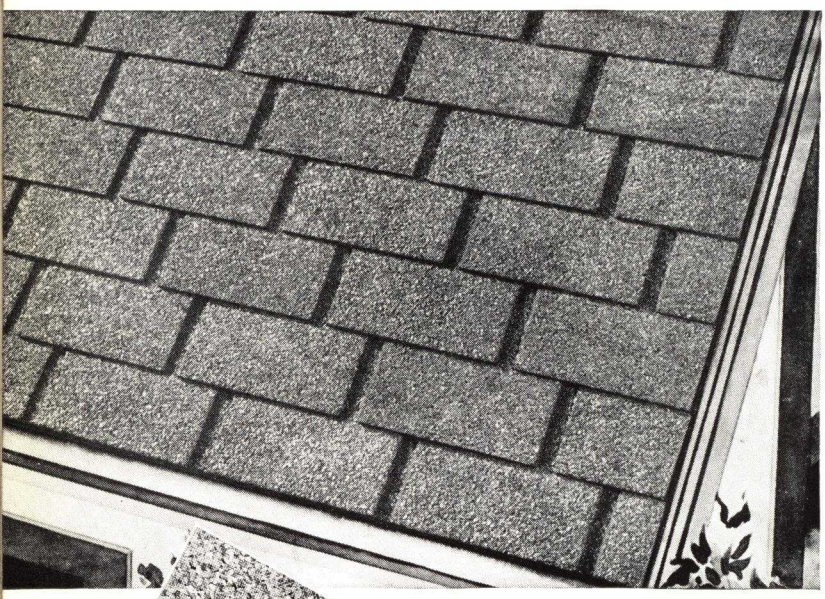


Weathered Brown
Careystone

Tudor Black
Careystone

6/14

Carey ASFALTSLATE SHINGLES



Large Size:
12 x 16 in.

Standard Size:
9 x 12¾ in.

LARGE SIZE • 12 x 16 IN.

Carey Asfaltslate Shingles, because of their sturdy construction, are heavier and stronger than ordinary composition shingles. Their mineral wearing surface is applied over an exceptionally heavy felt base, saturated with a special asphalt, insuring endurance and freedom from repairs.

Carey Large Size Asfaltslate Shingles are 12 x 16 ins. in size. Extra Heavy Weight. Exposure, 5 ins. 224 shingles (4 bundles) per square.

Plain Back: Approximately 325 lbs. per square.

Colors: Dixie Green, Slate Green, Tile Red, Blue Black.

Cork Insulated: Approximately 345 lbs. per square.

Colors: Dixie Green, Tile Red, Blue Black, Green Blend, Red Blend, Harvest Blend, Russet Blend, Emeralblend, Verdeblend.

Underwriters' Label Class C.

STANDARD SIZE • 9 x 12¾ IN.

The Standard Size of Carey Asfaltslate Shingles is manufactured under the same process as the Large Size, the only difference being that the Standard Size Shingles are smaller in size and lighter in weight.

Standard Size Asfaltslate Shingles are 9 x 12¾ ins. in size. Exposure, 4 ins. 372 shingles (4 bundles) per square.

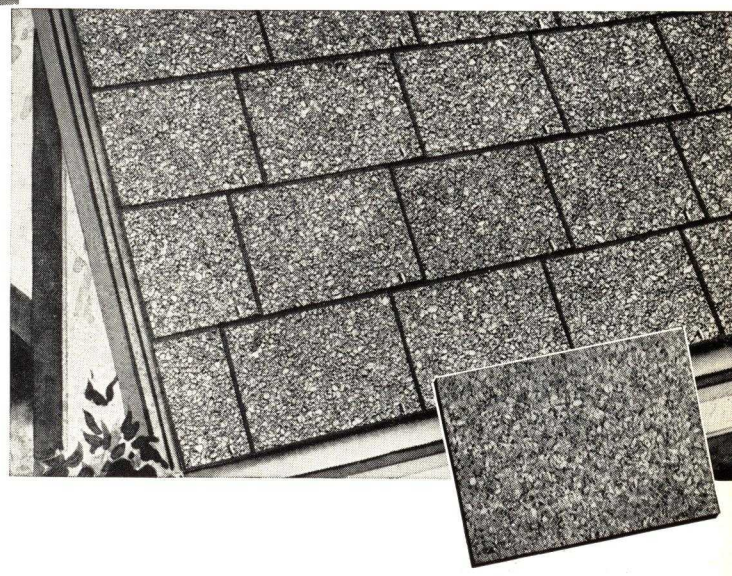
Colors: Dixie Green, Tile Red, Blue Black.

Weight: Approximately 253 lbs. per square, Plain Back.

Underwriters' Label Class C.

Carey Asphalt Saturated and Coated Sheathing Felt applied under the shingles assures longer service.

Careylok ASPHALT — SHINGLES



STANDARD WEIGHT

Careylok Shingles are especially designed for application over old roofs. Exposed corners are anchored with everlasting copper anchors which are furnished without extra charge. Though packed and priced for application with the headlap and sidelap indicated below, the headlap can be increased as desired.

Standard Weight Shingles are 12 x 16 ins. in size.

Exposure, 10 ins. Packed 112 (2 bundles) per square for single thickness application. Suggested sidelap 3 in.; headlap 2 in.

Colors: Dixie Green, Tile Red, Blue Black.

Weight: Approximately 130 lbs. per square.

Underwriters' Label Class C.

EXTRA HEAVY WEIGHT

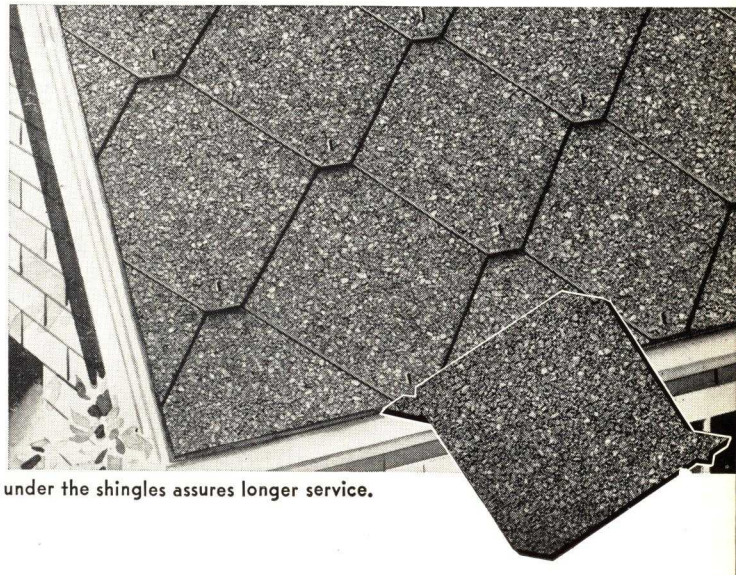
Either Plain Back or Cork Insulated Large Size Asphaltslate Shingles can be furnished with copper anchors for Careylok application.

Colors: See 12 x 16 Asphaltslate.

Weights: With Plain Back, approximately 162 lbs. per square. With Cork Insulation, 172 lbs. per square.

Underwriters' Label Class C.

Note: If double coverage on either weight of Careylok Shingles is desired, order 188 shingles (1.67 squares) for each square of roof area and apply with 6-in. headlap.



HEXAGONAL

Careylok Hexagonal Shingles are especially designed for application over old roofs.

Size, main body: 16 x 16 in. Copper Anchors furnished. 82 Shingles (2 cartons) per square.

Plain Back: Approximately 130 lbs. per square.

Colors: Dixie Green, Tile Red, Blue Black.

Cork Insulated: Approximately 140 lbs. per square.

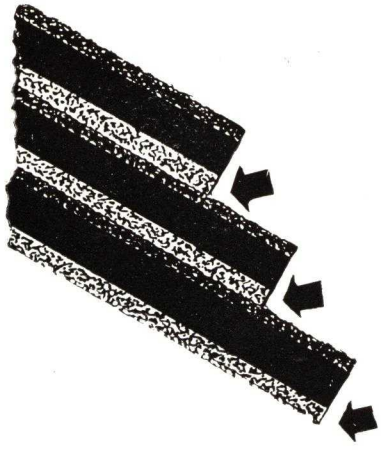
Colors: Dixie Green, Tile Red, Blue Black, Green Blend, Red Blend, Russet Blend, Emeralblend.

Underwriters' Label Class C.

Carey Asphalt Saturated and Coated Sheathing Felt applied under the shingles assures longer service.

Carey CORK INSULATED SHINGLES

THE ADDED ADVANTAGES OF CAREY CORK INSULATED SHINGLES



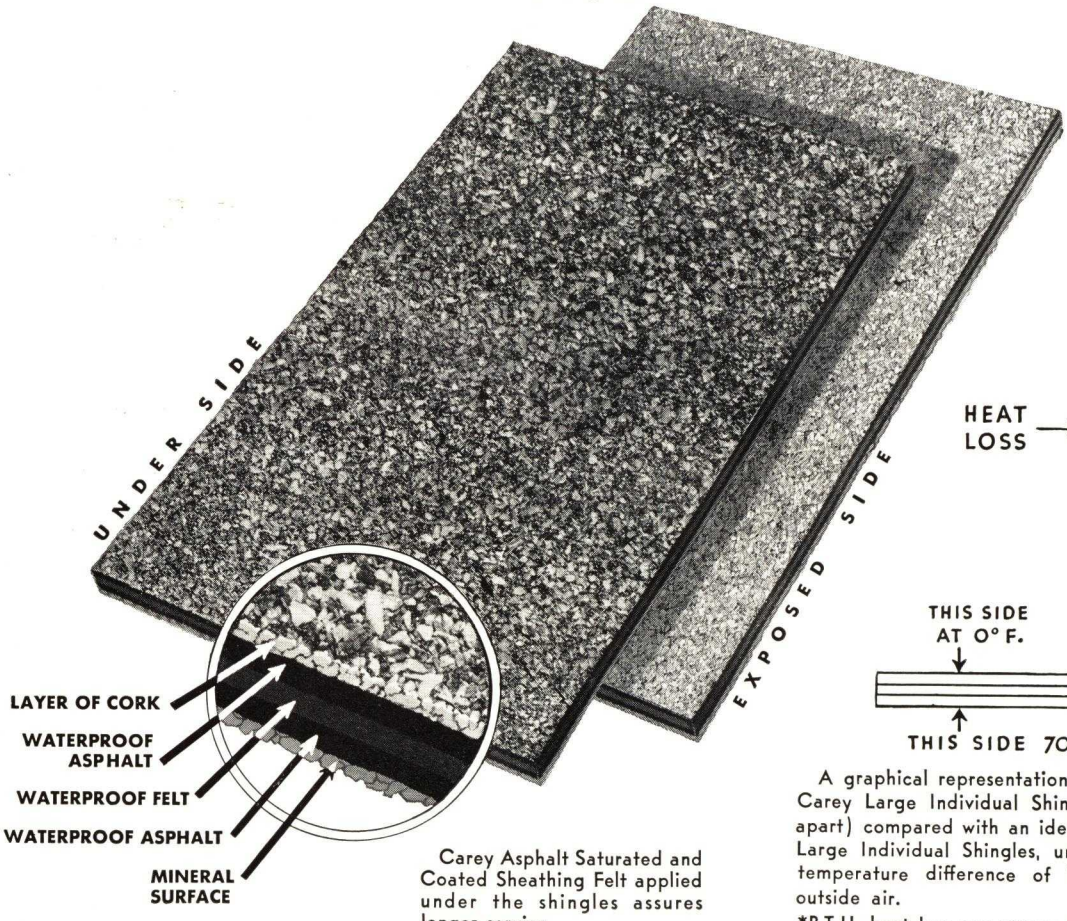
Three thicknesses of cork provide insulation, and this added thickness makes a more attractive roof with deep shadow lines.

BEAUTY—Carey Cork Insulated Shingles give crowning beauty to your building. They are made in shapes and colors to harmonize with any architectural and color treatment. The added thickness creates a deep shadow line which produces a rich finish.

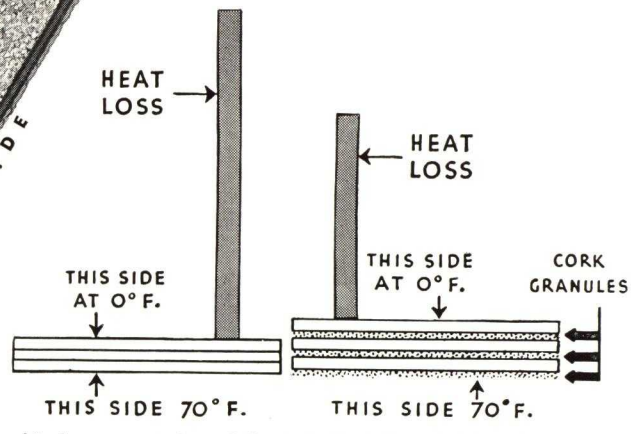
PERMANENCE—Carey Selected Materials, plus more complete saturation, non-fading Ceramic Granule Surface, and rigid inspection—guarded manufacturing process, give added permanence and complete weather resistance.

ECONOMY—A roof of Carey Cork Insulated Shingles gives economy through two lasting qualities — (1) roof insulation — with resulting comfort and fuel savings sufficiently large, in those localities where winter temperatures are low or fuel costs are high, to reimburse the home owner for the entire cost of the roof in a few years. (2) Complete freedom from roof maintenance expense.

FIRE RETARDANCE—Carey Cork Insulated Shingles bear the Class C Underwriters' label of approval — which means that they meet the strict requirements of the Underwriters' Laboratories — maintained by the National Board of Fire Underwriters — based on their burning brand and flame tests. In many localities, worthwhile savings can be made on fire insurance rates by applying a roof of Carey Cork Insulated Shingles.



Carey Asphalt Saturated and Coated Sheathing Felt applied under the shingles assures longer service.



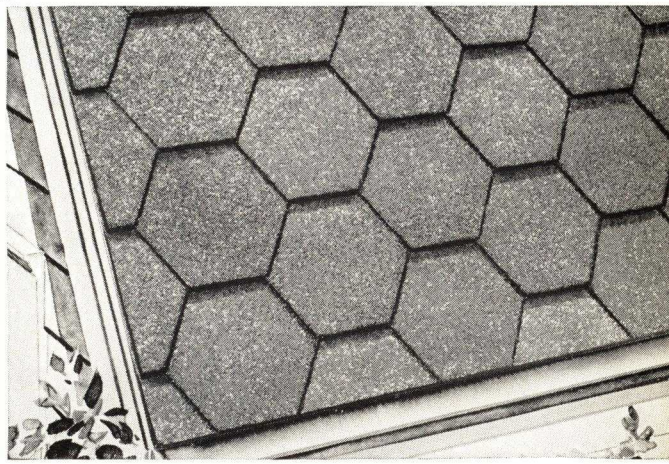
A graphical representation of the heat loss* through three layers of Carey Large Individual Shingles (5 ins. exposure and spaced ¾ in. apart) compared with an identical application of Carey Cork Insulated Large Individual Shingles, under the same test conditions, namely, a temperature difference of 70° F. between the inner surface and outside air.

*B.T.U. heat loss per square foot, per hour.

Carey ASPHALT STRIP SHINGLES

2 TAB HEXAGONAL

11⅓ x 36 IN.



2-in. headlap. 86 shingles — packed 2 bundles per square.

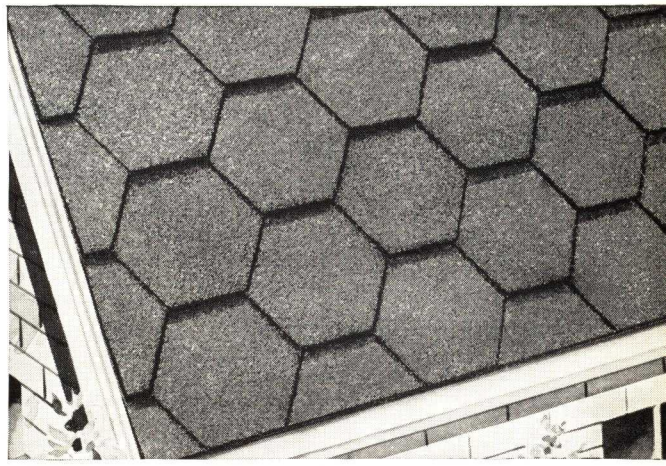
Colors: Dixie Green*, Slate Green, Tile Red, Blue Black, Green Blend, Red Blend, Harvest Blend, Russet Blend, Emeralblend, Verdeblend.

Weights: Approximately 167 lbs. per square. With Cork Insulation, 177 lbs. per square.

Underwriters' Label Class C.

*Can be furnished with cork insulation.

12⅓ x 36 IN.



3-in. headlap. 86 strips — packed 2 bundles per square.

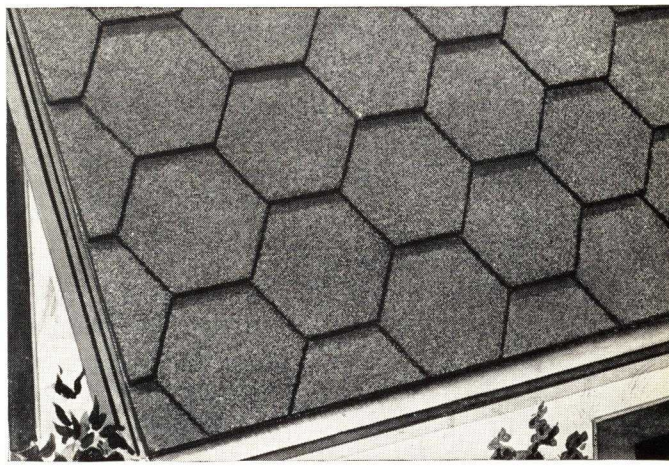
Colors: Dixie Green, Slate Green, Tile Red, Blue Black.

Weight: Approximately 186 lbs. per square.

Underwriters' Label Class C.

Not made with cork insulation.

14½ x 36 IN.



This has the advantage of being a double coverage shingle. 5 1/6-in. headlap. 86 shingles—packed 2 bundles per square.

Colors: Dixie Green, Tile Red, Blue Black.

Weight: Approximately 225 lbs. per square.

Underwriters' Label Class C.

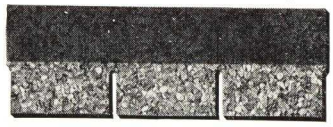
Not made with cork insulation.

Carey Asphalt Saturated and Coated Sheathing Felt applied under the shingles assures longer service.

CORK INSULATED STRIP SHINGLES

The addition of ground cork to the underside of this shingle gives the advantage of extra heat insulation value. Applied without extra labor cost.

3 TAB SQUARE BUTT
12 x 36 IN.



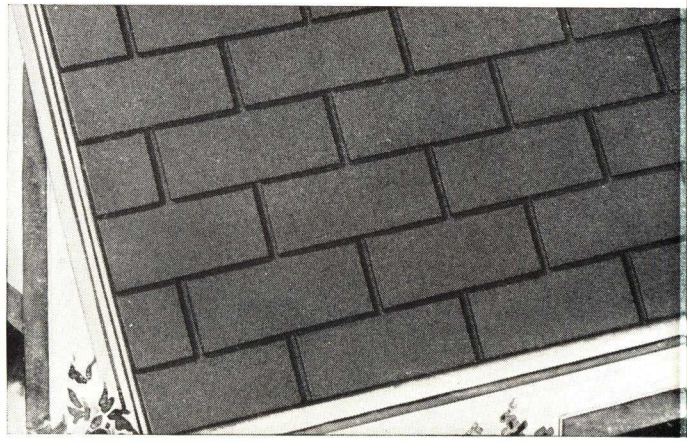
(Thick Butt — Plain Back or Cork Insulated.)

2-in. headlap. 80 strips — packed 2 bundles per square. Laid 5 ins. to the weather. Self spacing.

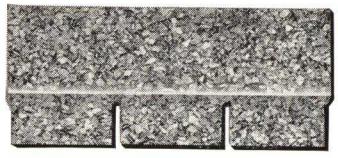
Colors: Dixie Green, Slate Green, Tile Red, Blue Black, Green Blend, Red Blend, Harvest Blend, Russet Blend, Emeralblend, Verdeblend.

Weights: Plain Back, approximately 210 lbs. per square. Cork Insulated, 215 lbs. per square.

Underwriters' Label Class C.



3 TAB SQUARE BUTT
15 x 36 IN.



(Thick Butt—Cork Insulated.)

5-in. headlap. 80 strips — packed 3 bundles per square. Laid 5 ins. to the weather. Self spacing.

Colors: Dixie Green, Slate Green, Tile Red, Blue Black, Green Blend, Red Blend, Harvest Blend, Russet Blend, Emeralblend, Verdeblend.

Weight: Approximately 270 lbs. per square.

Underwriters' Label Class C.

4 TAB SQUARE BUTT
10 x 36 IN.

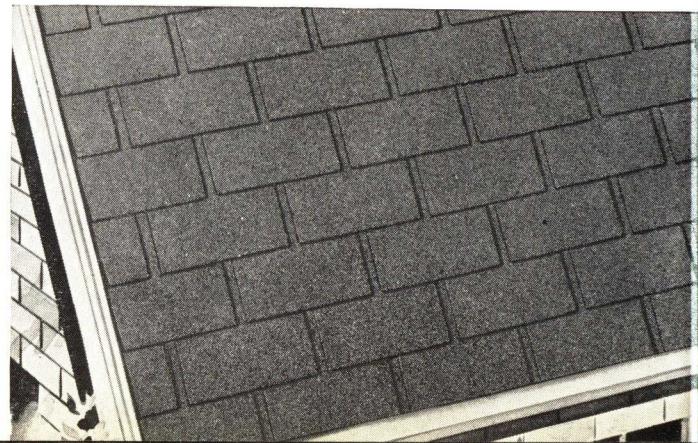
(Standard Weight — Plain Back.)

Size: 10 x 36 in. 2-in. headlap. 100 strips — packed 2 bundles per square. Laid 4 ins. to weather. Self spacing.

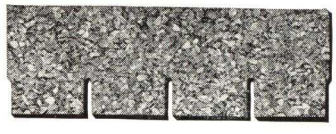
Colors: Dixie Green, Slate Green, Tile Red, Blue Black.

Weight: Approximately 210 lbs. per square.

Underwriters' Label Class C.



4 TAB SQUARE BUTT
12½ x 36 IN.



(Standard Weight — Plain Back.)

4½-in. headlap. 100 strips — packed 3 bundles per square. Laid 4 ins. to the weather. Self spacing.

Colors: Dixie Green, Slate Green, Tile Red, Blue Black.

Weight: Approximately 266 lbs. per square.

Underwriters' Label Class C.

Carey Asphalt Saturated and Coated Sheathing Felt applied under the shingles assures longer service.

Carey PREPARED ROLL ROOFING

LASTILE ROOFING • Mineral Surfaced

Colored granules are embedded into the top coating of asphalt, forming a hard, weather-resisting surface. A smooth selvage is provided along one edge to insure weather tight laps.

Standard Weight: 75 lbs., 2-in. selvage edge. Colors: Dixie Green, Tile Red, Slate Green, Blue Black.

Extra Heavy Weight*: 90 lbs., 2-in. selvage edge. Colors: Dixie Green, Slate Green, Tile Red, Blue Black.

SUPER LASTILE

Extra Heavy Weight*: 90 lbs., 4-in. selvage edge. Each roll (114 sq. ft.) complete with 2 pints Quick Drying Lap Cement and 1 lb. galvanized spiral nails. Covers 100 sq. ft. of roof surface.

Colors: Dixie Green, Tile Red, Blue Black.

BULLSEYE ROOFING • Fine Mica Surfaced

Bullseye Roofing is built on a felt of good quality but lighter in weight than used in our better grade roofings.

Light .....Approx. weight 35 lbs. per square
Medium .....Approx. weight 45 lbs. per square
Heavy .....Approx. weight 55 lbs. per square

SIMPLEX ROOFING • Talc Surfaced

Made to meet the demands for a low priced talc surface prepared roofing.

Light .....35 lbs. per roll
Medium .....45 lbs. per roll
Heavy .....55 lbs. per roll

CAREYPOINT ROOFING • Mineral Surfaced

For re-roofing over old roofs. No nails or lap cement furnished. Rolls contain 2 sheets providing enough material to cover 100 sq. ft. of roof area allowing for a 2-in. lap.

Colors: Dixie Green, Slate Green, Tile Red, Blue Black, Colorblend.

Finish: Slate.

*Weight: Approx. 100 lbs. per square.

COLOR-AGE ROOFING

Surfaced with red or green ceramic fine granules, Color-Age Roofing provides a low priced colorful roofing for structures where price is an important consideration.

Extra Heavy .....60 lbs. per roll

Colors: Tile Red and Dixie Green.

Finish: Ceramic, Fine Granules.

FLEXIBLE CEMENT ROOFING

A roofing built on a Burlap base, with all nail heads completely covered and protected by a clever lap joint.

Completing materials furnished.

3 pints Quick Drying Lap Cement, 1 lb. Galv. Spiral Nails and Sealing Strips for End Lap.

*Weight: Approx. 100 lbs. per roll.

Rolls: 33 in. wide (including the 1¼-in. packing strip which is torn off before application).

Sheet: 31¾ in. wide, 40 ft. 9 in. long.

Finish: Superfine granules.

Color: Blue Black.

MICA-KOTE ROOFING • Mica Surfaced, Both Sides

An extra quality roofing of heavy felt base saturated and coated with carefully selected asphalt and finished with Mica Flakes.

Medium .....Approx. weight 45 lbs. per square
*Heavy .....Approx. weight 55 lbs. per square
*Extra Heavy..Approx. weight 65 lbs. per square
*Super Grade (Solka Base).Approx. weight 75 lbs. per square

*Underwriters' Class C Label.

Unless otherwise specified all rolls contain 108 square feet (36 ins. wide by 36 ft. long) enough to cover 100 square feet of roof surface, sufficient quantity of lap cement and nails furnished.

PREPARED ROLL ROOFING (Continued)

SURETY ROOFING • Mica Surfaced, One Side—Talc Surfaced, One Side

Surety Roofing is an economical, smooth surface roofing recommended for any type of building where a low cost, durable roof is desired.

Light .....Approx. weight 35 lbs. per square
Medium .....Approx. weight 45 lbs. per square
*Heavy .....Approx. weight 55 lbs. per square
*Extra Heavy .Approx. weight 65 lbs. per square

STAGGERED EDGE ROOFING

An attractive low priced slate surfaced roofing designed to produce a novelty effect, for re-roofing over old roofs.

No nails or Lap Cement furnished.

Rolls contain 2 sheets, each 60 ft. 6 in. long, 17½ in. wide at outside points, sufficient to cover 125 sq. ft.

*Weight: 130 lbs. per roll.

Colors: Dixie Green with Blue Black edge, Tile Red with Blue Black edge.

Finish: Slate.

CAREY WHITE TOP ROOFING

Reinforced Asbestos Saturated Felt plied together with a top sheet of white asbestos which is adapted for use in built-up roof construction or as a ready roofing.

Rolls 36 in. wide, containing 108 sq. ft. with 2-in. selvage edge.

§3 Ply, approx. 55 lbs. per roll.

Furnished with Pyramid Kaps and Nails. We do not recommend that White Top Roofing be applied with nails and lap cement.

FIBEROCK ROOFING • Black Top

High grade Reinforced Asbestos Felt, thoroughly impregnated with an exceptionally high melting point asphalt, having the felts cemented together with asphalt, making this material both fire retarding and waterproofing.

Rolls 36 in. wide containing 108 sq. ft.

§3 Ply, 52 lbs. per roll.

§3 Ply, 6 sheets 3 x 6 ft. per square.

30 sheets (540 sq. ft.) per case, 65 lbs. per square.

ASBESTOS ROOFING • Grapevine Finish

A strong, compact, reinforced Asbestos Felt, thoroughly impregnated and coated on both sides. Talc surfaced.

* 53 lbs. per roll.

Rolls 36 ins. wide, 108 sq. ft.

Complete with galvanized nails and lap cement.

ASBESTOS ROOFING • Slate Surfaced

An unusually strong and compact reinforced Asbestos Felt, thoroughly saturated and coated on top side with tempered asphalt in which slate is embedded. 2-in. selvage edge.

Colors: Slate Green only carried in stock. Other standard colors made on special orders of 200 rolls or more. Complete with galvanized nails and lap cement.

†Weight: 85 lbs.

ASBESTOS ROOFING • Double Sanded

A high grade saturated and coated reinforced Asbestos Felt finished with a good, clean sand. Rolls 36 in. wide, 36 ft. 6 ins. long, containing 110 sq. ft., 2½-in. selvage edge. Complete with Pyramid Kaps and Nails.

§Approximate Weight: 68 lbs.

*Underwriters' Class C Label.
†Underwriters' Class B Label.
§Underwriters' Special B.U. Label.

Unless otherwise specified all rolls contain 108 square feet (36 ins. wide by 36 ft. long) enough to cover 100 square feet of roof surface, sufficient quantity of lap cement and nails furnished.

Carey BUILDING PAPERS FELTS and CAP SHEETS

BUILDING PAPERS AND FELTS

Carey waterproofed building papers keep out dampness, dust, grit, and wind; thus insuring a comfortable home.

BLUE PLASTER BOARD

Furnished in 250 sq. ft. rolls (36 ins. wide).
Weight: Approximately 30 lbs. per roll.

RED ROSIN SIZED SHEATHING

Furnished in 500 sq. ft. rolls (36 ins. wide).
Weights: Approximately 20, 25, 30 and 40 lbs. per roll.

BLUE ROSIN SIZED SHEATHING

Furnished in 500 sq. ft. rolls (36 ins. wide).
Weight: Approximately 20 lbs. per roll.

SLATERS FELT

Furnished in 500 sq. ft. rolls (36 ins. wide).
Weight: Approximately 32 lbs. per roll.

SHEATHING FELT • Saturated Only

Polar Brand—a light weight but tough sheet of saturated rag felt. Furnished in 500 sq. ft. rolls (36 ins. wide).
Weight: Approximately 35 lbs. per roll.

SHEATHING FELT • Saturated and Coated

Furnished in 200 sq. ft. rolls (36 ins. wide).
Weight: Approximately 50 lbs. per roll.

CAREY-KRAFT INSULATING PAPER

A very light, but surprisingly strong sheet of Saturated Kraft. Furnished in 250 sq. ft. rolls, 38" wide. Weight 10 lbs. per roll.

BUILDING AND DEADENING FELTS

Furnished in 50 sq. yd. rolls (36 ins. wide).

¾ lb. to sq. yd...Approximate weight 37 lbs. per sq.

1 lb. to sq. yd...Approximate weight 50 lbs. per sq.

1½ lbs. to sq. yd...Approximate weight 75 lbs. per sq.

2 lbs. to sq. yd...Approximate weight 100 lbs. per sq.

FIBREWOVE INSULATING PAPER

A strong, dense, jute paper, waterproofed with asphalt. Furnished in 500 sq. ft. rolls (36 ins. wide).

No. 1—Saturated only. 11 lbs. per sq. Approximate weight 55 lbs. per roll.

No. 2—Saturated only. 9 lbs. per sq. Approximate weight 45 lbs. per roll.

No. 3—Saturated only. 8 lbs. per sq. Approximate weight 40 lbs. per roll.

No. 4—Saturated only. 6 lbs. per sq. Approximate weight 30 lbs. per roll.

No. 5—Saturated only. 5 lbs. per sq. Approximate weight 25 lbs. per roll.

No. 6—Saturated and coated. 7 lbs. per sq. Approximate weight 35 lbs. per roll.

No. 7—Saturated and coated. 10 lbs. per sq. Approximate weight 50 lbs. per roll.

ROOFING ASPHALT AND FELT

ASPHALT SATURATED RAG FELT • Underwriters' Label

15 lbs. (432 sq. ft. per roll). Approximate weight 65 lbs.
30 lbs. (216 sq. ft. per roll). Approximate weight 65 lbs.

ASPHALT SATURATED ASBESTOS FELT • Underwriters' Label

Rolls 36 in. wide.

15 lb. Fiberock (324 sq. ft. per roll). Weight 45 lbs. per roll.

20 lb. Fiberock (coated one side) (324 sq. ft. per roll). Weight 60 lbs. per roll.

45 lb. Fiberock Base Sheet (coated and sanded two sides) (108 sq. ft. per roll). Weight 45 lbs.

65 lb. Asbestos Base Sheet (coated and sanded two sides) (108 sq. ft. per roll). Weight 65 lbs.

TAR SATURATED RAG FELT

No. 2 (216 sq. ft. per roll). Weight 50 lbs. per roll.

No. 3 (432 sq. ft. per roll). Weight 50 lbs. per roll.

15 lb. Carey-Seal (432 sq. ft. per roll). Weight 65 lbs. per roll 32 ins. wide.

MANCO ASPHALTS

Manco Asphalt (400-lb. drums).

Manco Asphalt (50-lb. drums).

Flat Manco (for flat roofs) will be furnished unless Steep Manco is specified.

NABOSAR ASPHALT

Steep (drums approximately 400 lbs. each).
Flat (drums approximately 400 lbs. each).
Slag (drums approximately 400 lbs. each).

MINERAL SURFACED CAP SHEETS

19-IN. SELVAGE EDGE

Rolls 36 ins. wide, 36 ft. long. Two rolls required to cover 100 sq. ft. roof area, giving 2-ply construction.

Colors: Indian Red, Slate Green, Blue Black.

Weight: Approximately 110 lbs. per square.

Underwriters' Special B. U. Label.

DUR-A-SEAL CAP SHEET • White Ceramic Surface

Rolls 36 ins. wide, 40 ft. long, containing 120 sq. ft., with 4-in. longitudinal selvage edge on one side and 6-in. transverse selvage edge for endlap for each 8-ft. section. Bottom of sheet is not coated with asphalt. No completing materials.

Mineral Surfaced—Approximate weight 75 lbs. per roll. Underwriters' Special B. U. Label.

THE PHILIP CAREY COMPANY

GENERAL OFFICES

LOCKLAND, CINCINNATI, OHIO, U. S. A.

Atlanta, Ga.	The Philip Carey Company	666 Greenwood Avenue, N.E.
Baltimore, Md.	The Philip Carey Company	1400 Moreland Avenue
Boston, Mass.	The Philip Carey Company	267 Medford St., Charlestown Dist.
Buffalo, N. Y.	The Philip Carey Company, Inc.	1174 Niagara Street
Charlotte, N. C.	The Philip Carey Company	131 Brevard Court
Chattanooga, Tenn.	The Philip Carey Company	212 Volunteer State Life Building
Chicago, Ill.	The Philip Carey Company	4512-18 Fillmore St.
Cincinnati, Ohio	The Philip Carey Company (Cincinnati Sales Office)	408 Commercial Square
Cleveland, Ohio	The Carey Company	5906-5916 Euclid Avenue
Columbus, Ohio	The Philip Carey Company	100 W. Spring St.
Dallas, Texas	The Philip Carey Company	809 Thomas Building
Dayton, Ohio	The Philip Carey Company	Weakley Street at B. & O.R.R.
Detroit, Mich.	The Carey Company	6197 Hamilton Avenue
Indianapolis, Ind.	The Philip Carey Company	1111 E. 19th Street
Kansas City, Mo.	The Philip Carey Company	2008-2010 McGee Street
Los Angeles, Calif.	The Philip Carey Company	4536 District Boulevard
Louisville, Ky.	The Philip Carey Company, Inc.	1032-1044 South Eighth Street
Memphis, Tenn.	The Philip Carey Company	920 Dermon Building
Minneapolis, Minn.	The Philip Carey Company	112 Lumber Exchange
Nashville, Tenn.	The Philip Carey Company	1120 Nashville Trust Building
New York, N. Y.	The Philip Carey Company, Inc.	Lincoln Building, 60 E. 42nd Street
Norfolk, Va.	The Philip Carey Company	23rd and Granby Streets
Philadelphia, Pa.	The Philip Carey Company	24th and Sedgley Avenue
Pittsburgh, Pa.	The Philip Carey Company	Corliss Station
St. Louis, Mo.	The Philip Carey Company	4165 Duncan Avenue
Seattle, Wash.	The Philip Carey Company	820 Fairview Place
Wheeling, W. Va.	The Philip Carey Company	Chapline at 18th Street

Form 4417

SECTION 6

CONTINUED ⟶

JOHNS-MANVILLE

EXECUTIVE OFFICES

22 East 40th Street, NEW YORK, N. Y.

Member of the Producers' Council, Inc.

Products

JOHNS-MANVILLE RIGID ASBESTOS ROOFING and SIDING SHINGLES and ASPHALT ROOFING and SIDING SHINGLES.

For the following Johns-Manville products, see File Index: Acoustical Materials; Built-up and Insulated Roofs; Home Insulation; Insulating Board; Pipe Coverings and Insulations; Asphalt Tile Flooring; Transite, Flat and Corrugated; Asbestos Wainscoting and Asbestos Flexboard; Steeltex for plaster, stucco and brick or stone veneer; Steeltex Floor Lath and Welded Wire Reinforcement; Transite Walls for office partitions; Flush Doors.

JOHNS-MANVILLE RIGID ASBESTOS ROOFING AND SIDING SHINGLES

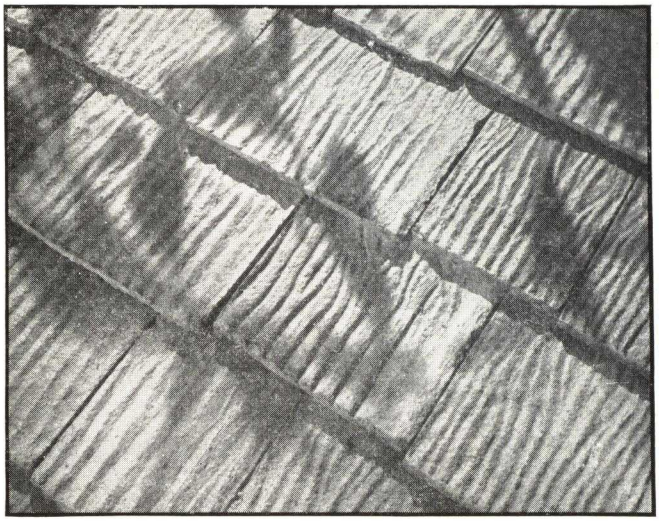
J-M Rigid Asbestos Roofing and Siding Shingles are made of asbestos fibre and portland cement united under great pressure. They are fireproof and highly resistant to weather and wear.

J-M ASBESTOS ROOFING SHINGLES

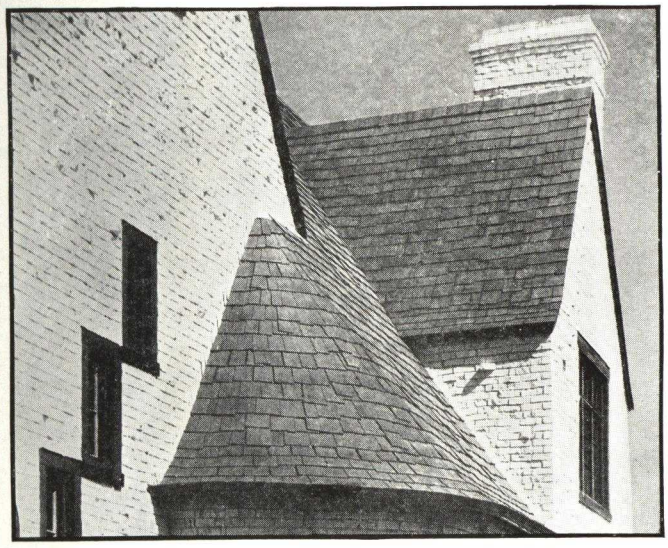
J-M Asbestos Roofing Shingles are manufactured in various sizes for application in three styles broadly known as the American, Dutch Lap and Hexagonal methods. Included are shingles of uniform or tapered thickness, smooth or rough texture, applicable in one uniform color or in two or more colors blended.

The application of the American Method shingles, like other roofing materials of this form, may be varied to obtain effects ranging from those in which the line of the butts appear straight and entirely regular, to those in which the units appear to have been placed entirely at random, with no definite scheme of regularity having been followed. Eaves starters, eaves shingles, ridge and hip shingles, and ridge roll are provided as required by the various styles and varieties.

Tables containing colors, dimensions, weights and other data on each style, as well as on various types of siding shingles, will be found on pages 2 and 4.



The charm and beauty of Early American Colonial roofs recaptured, and made fireproof and lasting in Salem Shingles



I-M Rigid Asbestos Shingles, American Method

It is recommended that roof surfaces which are to receive asbestos shingles be pitched not less than 4 in. to the foot where American Method Shingles are to be used and not less than 5 in. to the foot for the Hexagonal or Dutch Lap Methods. Siding shingles should be applied only to vertical walls.

Underwriters' Rating

American Method Roofing Shingles carry the Underwriters' Class A label.

Dutch Lap and Hexagonal Method Roofing Shingles carry the Underwriters' Class B label.

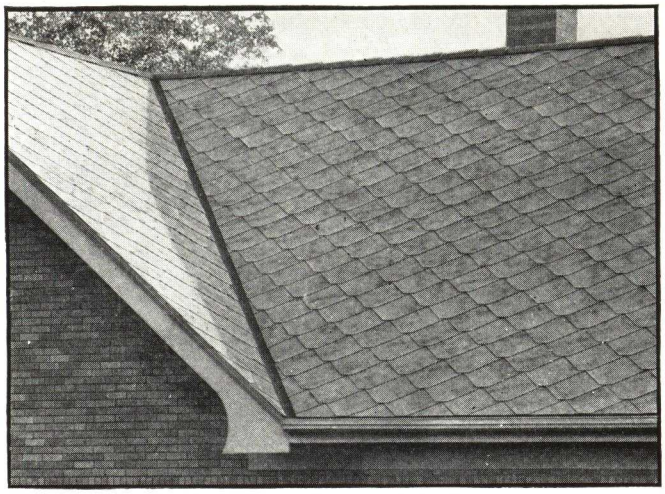
Salem Roofs

J-M Salem Singles have been developed to provide when applied, a literal counterpart in appearance of the aged hand-hewn wood shingle roofs of early New England, and have, in addition, the advantage of being fireproof and superior in all points of durability.

These shingles are available in warm weathered gray, brown and black and in varying shades of greens and reds, all of which may be used singly or in combination.

They may be applied over solid wood sheathing in new construction or over existing wood shingles.

Data on the Salem Shingles will be found in the table at the bottom of the next page.



J-M No. 70 Hexagonal Shingles
Because of its pleasing design and great economy, this is one of the most popular asbestos shingle styles

Dutch Lap and Hexagonal Methods

In addition to the Salem Shingles, which are laid American method, other styles have been developed to provide, at a cost within the budget limitations of even the most modest house, a fire and weather resisting roofing material which, through a proper combination of colors, or colors and texture, makes the roof partake of the spirit of the house and its surroundings.

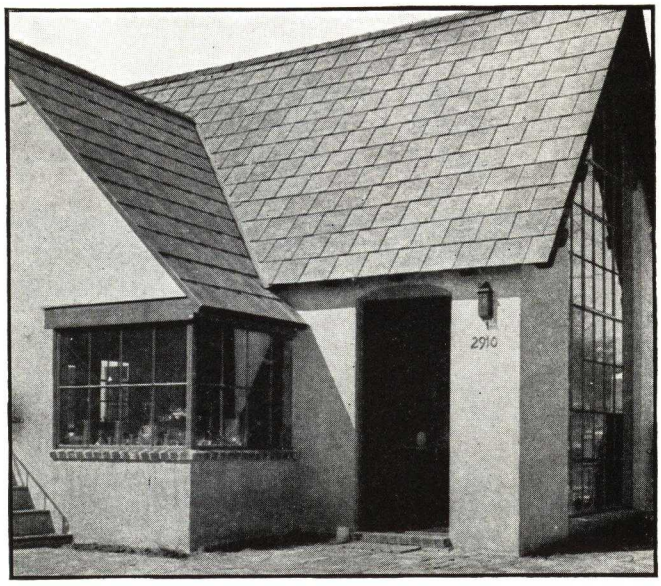
No. 70 Hexagonal Shingle—Applicable by the familiar Hexagonal method, this shape provides a saving in labor and material through the relatively few number of pieces per square involved.

No. 30 Dutch Lap Shingle—This shingle, with the economy of the Dutch Lap method, provides the familiar horizontal butt line characteristic, at about the cost of high grade asphalt shingles or other low priced roofing materials of far less permanence.

Both of these styles make procurable, at low cost, a durable, fireproof roof in colors which are in keeping with the character of the building.

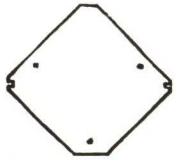
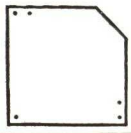
Re-roofing

For many years, Johns-Manville has advocated, in connection with re-roofing projects, the application of rigid asbestos shingles directly over existing wood shingles. This practice has been followed so successfully that we do not hesitate to recommend it to the architect.



J-M No. 30 Dutch Lap Shingles
This beautiful Dutch Lap Roof demonstrates how closely the lines of this shingle resemble the American method

DATA ON JOHNS-MANVILLE RIGID ASBESTOS ROOFING SHINGLES

Shape	Catalog No. and type	Size	Thickness	Colors marked with (*) have a textured surface; others are smooth surfaced	Approx. weight per square applied, lb.	Weather exposure	Number of shingles required per square	Galvanized shingle nails required per square	Copper storm anchors req'd per square	Catalog No. of eaves starter or hip and ridge shingle to be used.
	No. 35 Salem American method	Standard 8″x16″ Random 6″, 8″ and 10″x16″	Tapered ¼″ butt	*1. Weathered gray *2. Weathered black *3. Olive green *4. Sea green *5. Apple green *6. Forest brown *7. Granada red *8. Touraine red	540	7″	260	2½ lb. 1¼″ nail	None	No. 36 Salem starter No. 37 Salem hip and ridge
	No. 70 Hexagonal method	16″x16″	Uniform 3/16″ approx.	Mottled gray Mottled blue-black Mottled red *Mottled green Mottled copper	275	13″x13″	86	1 lb. 1¼″ nail	86	No. 17 and No. 71 starters
	No. 30 Dutch Lap method	16″x16″	Uniform 3/16″ approx.	Mottled gray *Mottled blue-black *Mottled red *Mottled green Mottled copper	290	¼ side lap 13″x12″ ⅓ side lap 13″x10⅔″	92 per 99⅔ sq. ft. 104	1 lb. 1¼″ nail	92 per 99⅔ sq. ft. 104	No. 31 starter

JOHNS-MANVILLE ASBESTOS SIDING SHINGLES

J-M Tapered Shake Texture Asbestos Siding Shingles

In these asbestos siding shingles, Johns-Manville has captured all the beauty of texture found in weathered hand-hewn wood shingles, mellowed by time, and has made this charm available in a lasting, fireproof material.

Siding of J-M Shake Texture Asbestos Siding Shingles is durable and fireproof, for these shingles will not rot, corrode, split or burn. They do not need periodic painting to preserve them. Their colors—blended gray and oyster white—produce the attractive appearance of the old originals. The tapered butts carry out the effect of ruggedness and give a heavy shadow line.

Yet, despite all their advantages of beauty, fire protection and durability, these new Shake Texture Shingles cost less applied than most other types of siding

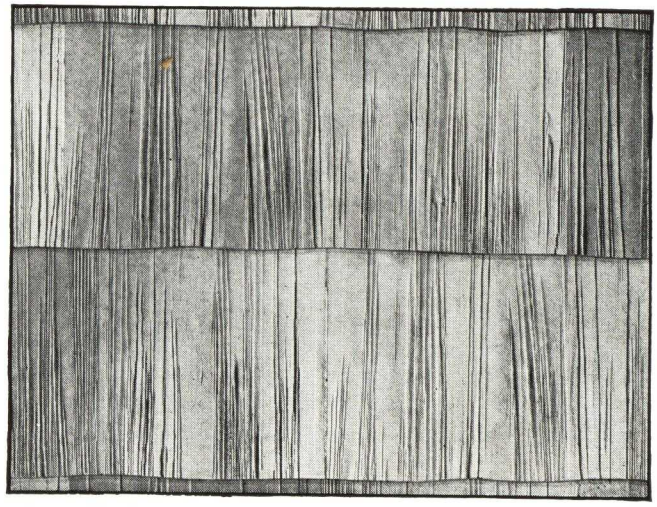
Colonial Charm with Fireproof Johns-Manville Asbestos Siding Shingles with Cedargrain Texture

of comparable permanence. Although the wide units, when applied, have the appearance of individual shingles in random widths, they are actually large sheets which cover large areas quickly and economically.

When used for re-siding work, they can easily be applied right over the old wood siding, thereby saving the expense of tearing off the old material. Combined with a roof of J-M Asbestos Roofing Shingles they complete the protection of the exterior of the building from fire and weather.

J-M Cedargrain Texture Asbestos Siding Shingles

These shingles possess all the qualities of durability and fire-resistance of the Shake Texture Shingles but



Close View of the No. 105-T Shake Texture Siding Shingles

differ in that they are of uniform thickness and have the graining of the ordinary weathered wood shingle. Available in blended gray, oyster white, mottled gray or special mottled gray, they offer a range of color suitable for the majority of moderate-priced houses. They are adaptable for use on new work or for re-siding over old materials.

Sizes, weights and other detail data on all types of J-M Asbestos Siding Shingles will be found on the following page.

J-M Cedargrain Asbestos Clapboards

The desirable features of lapped wood siding, plus durability and freedom from maintenance for preservation are incorporated in J-M Cedargrain Asbestos Clapboards. Made of asbestos and portland cement, they are fireproof, rot-proof and require no painting to preserve them.

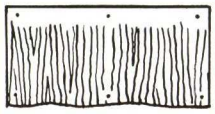
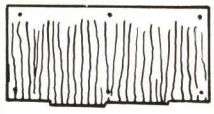
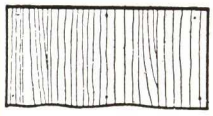
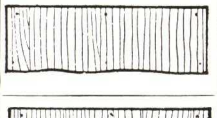
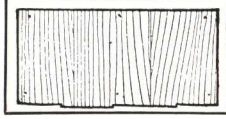
The face of each clapboard is attractively surfaced for its entire length to give the effect of the grain in natural wood. The clapboards are sufficiently large to permit rapid and economical application.

J-M Cedargrain Asbestos Clapboards

J-M Cedargrain Asbestos Clapboards are $\frac{3}{16}$ in. thick, 9½ in. wide, and 8 ft. long. They are designed to be applied with 1½-in. lap, giving 8-in. exposure to the weather. Sufficient material to cover one square consists of the equivalent of nineteen 8-ft. lengths, which are packed in two bundles. With each square there are shipped 25 backer strips and ½ lb. of 1¾-in. bronze face-nails. In addition, ¾ lb. of 1¼-in. galvanized needlepoint nails (1¼ lb. 2-in. nails for re-siding) are required for the concealed nailing.

The clapboards are factory-punched on approximately 16-in. centers, 1½ in. from butt edge to receive face-nails and 1 in. from head to receive galvanized iron shingle nails.

DATA ON JOHNS-MANVILLE RIGID ASBESTOS SIDING SHINGLES

Shape	Catalog No. and type	Size	Thickness	Texture	Colors	Approx. weight per square applied, lb.	Weather exposure	Number of shingles required per square	Galvanized shingle nails required per square
	105-T	24″x12″	Tapered $\frac{5}{16}$″ butt (approx.)	Shake	Oyster white Blended gray	260	10½″	57	1¼ lb. 2″ nail
	107-T	24″x12″	Tapered $\frac{5}{16}$″ butt (approx.)	Shake	Oyster white Blended gray	270	10″	60	1¼ lb. 2″ nail
	No. 105-U	24″x12″	Uniform $\frac{3}{16}$″ approx.	Cedargrain Smooth	Blended gray Oyster white Mottled gray Special mottled gray	185	10½″	57	1¼ lb. 2″ nail
	No. 106	24″x8″	Uniform $\frac{3}{16}$″ approx.	Cedargrain	Blended gray Oyster white	200	6½″	93	2 lb. 2″ nail
	No. 107-U	24″x12″	Uniform $\frac{3}{16}$″ approx.	Cedargrain	Blended gray Oyster white	195	10″	60	1½ lb. 2″ nail

JOHNS-MANVILLE ASPHALT ROOFING AND SIDING SHINGLES

Johns-Manville Asphalt Roofing and Siding Shingles are made of heavy felts saturated with the finest asphalt and surfaced with crushed mineral. They are made as strip shingles, both Hexagonal and American styles, and as individual shingles, American, Dutch Lap and Hexagonal styles. All J-M Asphalt Roofing Shingles carry the Underwriters' Class C label.

These shingles are made in a variety of colors, including monotones and blends. Among the latter are the "Duo-Blend" effects in which the base color is overlaid intermittently with another color.

The Double Coated Thick Butt strip shingles have an extra coating of asphalt and slate on the exposed side. The Sealed Edge Thick Butt strip shingles are redipped, which gives a thick butt and sealed edges.

Color reproductions of J-M Asphalt Shingles and complete data on sizes, weights, exposure, etc., are included in the new J-M Building Material Catalog, which may be had on request at any Johns-Manville office. Ask for Form BM-2A.

J-M Asphalt Shingles make a colorful, long-lived roof, at low cost

MEMORANDA

KEASBEY & MATTISON COMPANY

AMBLER, PA.

DISTRICT OFFICES

ATLANTA, GA. CHICAGO, ILL. CLEVELAND, OHIO HOUSTON, TEX. NEW YORK, N. Y.
PHILADELPHIA, PA. SAN FRANCISCO, CALIF.

For K&M **"Century"** Decorative Wallboards, Mineral Wool Home Insulations, Pipe, Sheet and Block Insulations, Asbestos Corrugated and Trafford Tile, see File Index.

The first asbestos-cement shingles made in this country were produced by Keasbey & Mattison Company in 1905. Since that time, this company, which is one of the oldest and largest manufacturers of asbestos products, has continued to play a leading part in the development of asbestos shingles and asbestos-cement products.

K&M "Century" Asbestos shingles are manufactured from selected asbestos fibre scientifically combined with Portland cement. Formed under tremendous hydraulic pressure, they are fire-resisting, weather-resisting, and termite-proof. They never need protective painting.

Textures have been developed that give the architect a full range of effects that portray effectively the architectural periods of the past, as well as the more modern styles.

On this and the following pages will be found illustrations and data covering K&M "Century" Asbestos Roofing and Siding Shingles.

K&M No. 92 AMERICAN METHOD ASBESTOS ROOFING SHINGLES

Thick, tapered butts, irregular edges, heavy shadow lines, and deep, rich vertical texture characterize this aristocratic American Method Shingle. On the roof, it has the mellowness of costly thick-butt cypress shingles after they have had many years exposure to weather. The texture of these shingles is varied and interesting. This distinctive shingle is appropriate for many types of homes. It is non-combustible, and carries Class "A" Fire Underwriters label. Available in a wide range of colors, to meet varying architectural requirements.

Rustic Blend, which is illustrated in full color on the next page, is also available in this style shingle.

Application recommendations furnished upon request to Headquarters, at Ambler, Penna., or to any K&M District Office.

No. 92 Specifications

Size—9″ wide x 18″ high x ¼″ tapered butt. *Random widths available.

Shingles per square—200 pieces.

Head Lap—2″. **Exposure**—8″.

Approx. weight per square—525 lbs.

Colors—Royal Red, Lindenwold, Dell Green, Olive Green, Oxford Black and Rustic Blend.

*Random Widths—Available in any combination of widths that cut without waste from 18″ blank shingles.

STANDARD COLORS OF NOS. 92, 99, AND 100 ROOFING SHINGLES

Royal Red Lindenwold Dell Green Olive Green Oxford Black

Application of No. 92 "Century" Roofing Shingles

K&M No. 99 AMERICAN METHOD ASBESTOS ROOFING SHINGLES

The popular Lindenwold color and texture resemble in appearance the old Colonial type, hand-hewn shingle. Recommended for both new construction and restoration work.

No. 99 Specifications

Size—9¼" wide x 18½" high x $\frac{7}{16}$" tapered butt. *Random widths available.

Shingles per square—190 pieces

Head Lap—2". **Exposure**—8¼".

Approx. weight per square—900 lbs.

Colors—Lindenwold, Royal Red, Dell Green, Olive Green, Oxford Black and Rustic Blend.

* Random Widths—Available in any combination of widths that cut without waste from 18½" blank shingles.

K&M No. 100 AMERICAN METHOD ASBESTOS ROOFING SHINGLES

No. 100 Specifications

Size—9¼" wide x 18½" high x $\frac{5}{16}$" tapered butt. *Random widths available.

Shingles per square—190 pieces.

Head Lap—2". **Exposure**—8¼".

Approx. weight per square—625 lbs.

Colors—Lindenwold, Royal Red, Dell Green, Olive Green, Oxford Black and Rustic Blend.

* Random Widths—Available in any combination of widths that cut without waste from 18½" blank shingles.

This asbestos shingle gives the effect of old, weathered wood shingles. The "Lindenwold" is textured individually with no two shingles exactly alike.

"Rustic Blend" is a four color combination consisting of 30% each of three shades of purplish brown and 10% of contrasting buff. These colors when blended give a soft autumnal effect. Variations of Rustic Blend are possible by changing the percentages of each shade, or any one shade will be furnished on request. Rustic Blend as illustrated below is designated as Nos. 3, 2, 1, 4, reading from left to right.

FOUR SHADES OF RUSTIC BLEND AVAILABLE IN NOS. 92, 99 AND 100 ROOFING SHINGLES

No. 3 No. 2 No. 1 No. 4

K&M No. 16 AMERICAN METHOD ASBESTOS ROOFING SHINGLES

A popular American Method Shingle for roofing, either in renovizing work or new construction. Made by the laminated process and of a light though sturdy construction.

Five pleasing colors are illustrated on the next page under "K&M No. 30 Side Lap Asbestos Roofing Shingles."

Colors are obtained by the use of pure mineral pigments which have proved their lasting quality by more than twenty-five years of satisfactory service.

No. 16 Specifications

Size—8" high x 16" wide x $\frac{5}{32}$" uniform thick.

Shingles per square—260 pieces.

Head Lap—2". **Exposure**—7".

Approx. weight per square—400 lbs.

Colors—Pearl Gray, Graytone, Spanish Red, Black and Surf Green.

K&M No. 30 SIDE LAP ASBESTOS ROOFING SHINGLES

This type of shingle, often called "Dutch Lap," resembles the more expensive American Method application due to the presence of both horizontal and vertical lines. An exceedingly desirable, low cost shingle, with its texture giving a weathered wood effect. Large unit size reduces the cost of application. Punched for application either with ¼ side lap or ⅓ side lap.

Two edges of each shingle are completely covered by adjoining shingles, leaving only one exposed corner which is rigidly fastened with a storm anchor of solid copper. This side lap shingle is rigid and strong and offers effective protection for the surface it covers, being especially efficient in areas subject to wind storms of high velocity. It is fire-resisting and termite-proof, and well adapted to most types of architecture.

No. 30 Specifications

Size—16″ high x 16″ wide x $\frac{5}{32}$″ uniform thick.

Shingles per square—92 pcs. for ¼ lap, 104 pcs. for ⅓ lap.

Head Lap—3″.

Side Lap—4″ for ¼ lap; 5⅓″ for ⅓ lap.

Exposure—12″ x 13″ for ¼ lap, 10⅔″ x 13″ for ⅓ lap.

Approx. weight per square—280 lbs. for ¼ lap, 315 lbs. for ⅓ lap.

Colors—Pearl Gray, Graytone, Spanish Red, Black, Surf Green.

STANDARD COLORS OF NOS. 16 AND 30 ROOFING SHINGLES

K&M No. 57 ASBESTOS BROADSIDING SHINGLES

A low cost siding shingle of genuine beauty. It is uniform in thickness, and its deep, cypress graining and wavy butt line present a pleasing weathered effect. These shingles are fire-resisting, termite-proof and never need protective painting. The mineral pigment coloring is a part of the shingle itself. This shingle and the two which follow, Nos. 60 and 75, are all available in Shell White and Graytone. These two colors are shown at the bottom of the next page. For method of application, write Headquarters at Ambler, Pa., or any of the K&M District Sales offices.

No. 57 Broadsiding Specifications

Size—12″ high x 24″ wide x $\frac{5}{32}$″ thick.

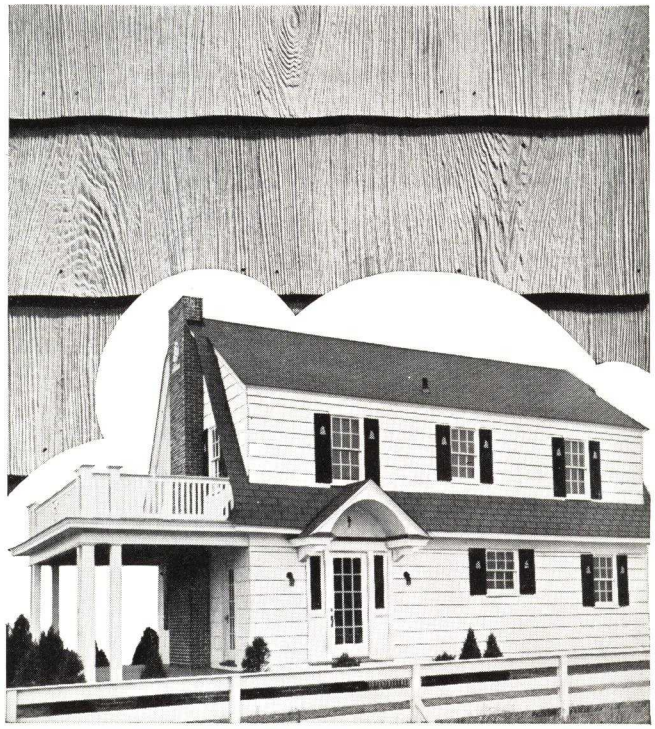
Butt construction—Wavy Line.

Shingles per square—57 pieces.

Overlap—1½″. **Exposure**—10½″ x 24″.

Approx. weight per square—185 lbs.

Colors—Shell White and Graytone.



Application of No. 57 Broadsiding . . . Shell White

K&M No. 60 ASBESTOS BROADSIDING SHINGLES

A staggered butt-line shingle giving the appearance of weathered cypress. The effect is similar to that of the most expensive random exposure wood units.

No. 60 Broadsiding Specifications

Size—12″ high x 24″ wide x $\frac{5}{32}$″ thick.

Butt construction—Staggered.

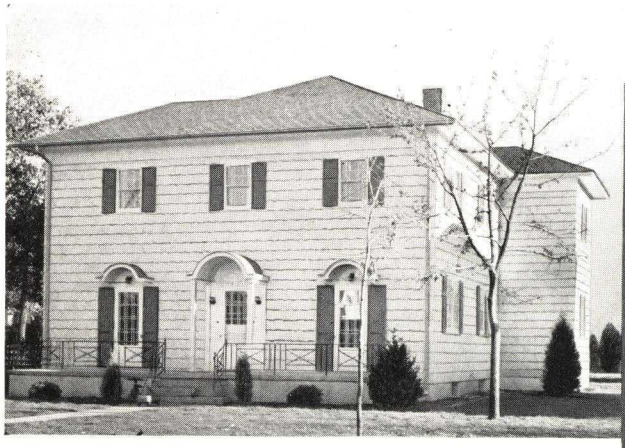
Shingles per square—60 pieces.

Overlap—2″. **Exposure**—10″ x 24″.

Approx. weight per square—190 lbs.

Colors—Shell White and Graytone.

K&M No. 60 Broadsiding



Application of No. 60 "Century" Broadsiding

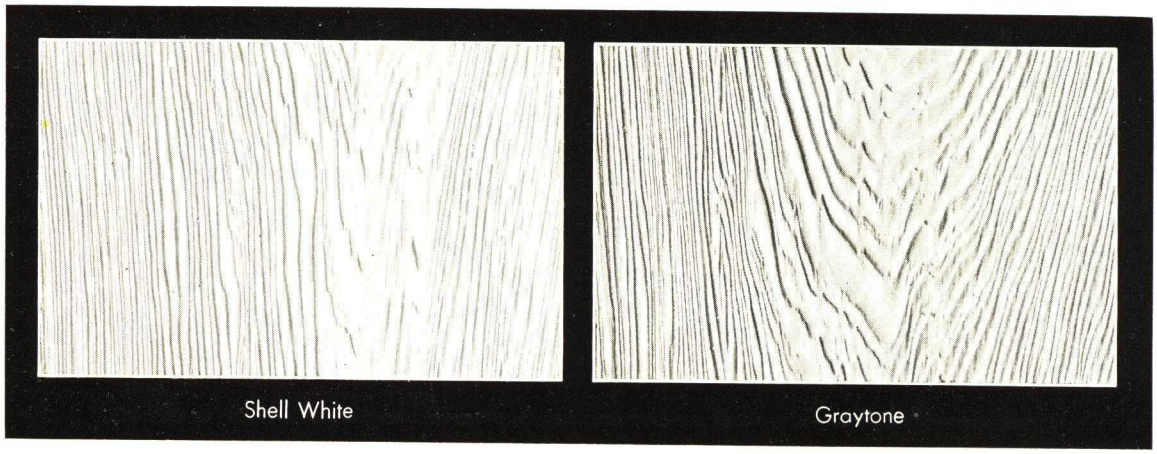
K&M No. 75 ASBESTOS BROADSIDING SHINGLES

K&M No. 75 is a Broadsiding shingle especially adaptable to small buildings. It is a wavy butt shingle, with exposure approximating that of high grade wood siding shingles. It is also recommended for use with the larger No. 57 shingle where it is desired to use one or two courses of narrower shingles to break sameness of effect. This shingle is fire-resisting, termite-proof and never needs protective painting.

No. 75 Broadsiding Specifications

Size—9½″ high x 24″ wide x $\frac{5}{32}$″ thick.
Butt construction—Wavy Line.
Shingles per square—75 pieces.
Overlap—1½″. **Exposure**—8″ x 24″.
Approx. weight per square—195 lbs.
Colors—Shell White and Graytone.

STANDARD COLORS OF NOS. 57, 60 AND 75 BROADSIDING SHINGLES



Williamsburg

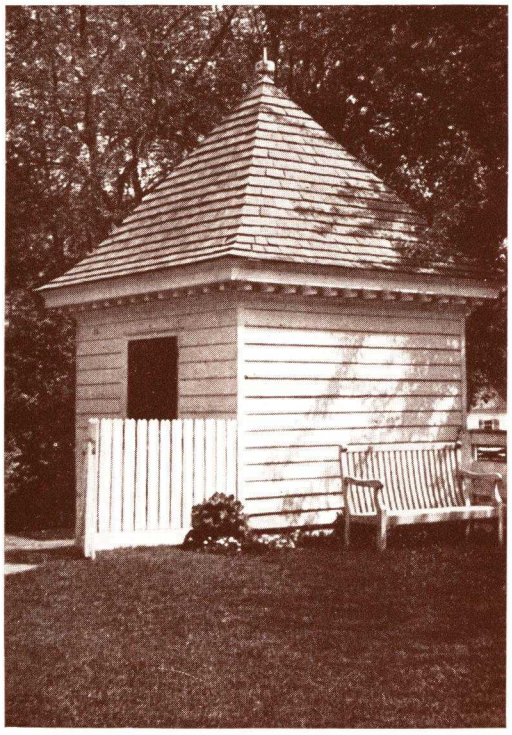
TAPERED ASBESTOS SHINGLES

by MOHAWK

Williamsburg SHINGLES DEVELOPED

PHOTOGRAPH © BY F. S. LINCOLN

THE INTERESTING ROOF
OF THE RALEIGH TAVERN, WILLIAMSBURG, VA.
View taken from the Duke of Gloucester Street



ONE OF THE OUT BUILDINGS
IN THE RESTORATION OF WILLIAMSBURG, VA.
This roof shows the use of the Fantail Hip.

A FIREPROOF FAC-SIMILE OF WEATHERED WOOD SHINGLES

WHEN, in 1699, the Virginia Colony removed its capital from the original Jamestown Settlement to Middle Plantation, those who laid out the plan of the new city (renamed Williamsburg) sought among other things to minimize the danger of conflagration. The complete destruction wrought at Jamestown by the fire arrows of attacking Indians was a vivid and recent memory. The new houses were spaced widely apart, but because lack of roads made it over-costly to bring native fireproof roofing materials from far distant quarries, the roofs, except on the principal government buildings, were of hand split wooden shingles.

Beautiful and appropriate with Early American architecture as were the weathered shingle roofs, through the years fire took its toll. Yet even today the soft, natural coloring and texture of weathered wood shingles remains the American ideal in roofing.

The Williamsburg Restoration Recaptures the Original Charm

The restoration of Colonial Williamsburg through the generosity of Mr. John D. Rockefeller, Jr., has awakened the American public to an appreciation of fine architecture as has no other one thing in recent years. Under the supervision of Perry, Shaw and Hepburn, Architects of Boston, the re-birth of an authentic Colonial City is one of the notable architectural achievements of the century.

Little wonder, then, that when the work of restoration was in the planning stage it was determined that, in the interest of posterity, the roofs should be laid with shingles in exact simulation of the originals. Yet they had to be fireproof! The work of producing such a shingle was entrusted to Mohawk, in order that the structural advantages of our Tapered Asbestos Shingles already on the market should be incorporated in the shingles required for the Restoration.

"Williamsburg" Shingles Made to a Rigid Specification

The architects of Colonial Williamsburg laid down a definite specification, in which beauty in appearance and structural soundness were of equal importance.

Illustration on Front Cover is the St. George, Tucker House, Williamsburg, Va., erected about 1788
PHOTOGRAPH © BY F. S. LINCOLN

MOHAWK ASBESTOS SHINGLES, INC.

FOR COLONIAL WILLIAMSBURG RESTORATION

1. Appearance of Weathered Individual Wood Shingles

As the original shingles had been of wood, it was necessary to obtain the identical appearance of a wood shingle which had been worn and weathered through the action of time and elements. The Mohawk shingles vary in thickness from 3/8 to 1/2 in. at the butts, giving a slightly irregular effect comparable to hand split wood shingles.

2. Individual Hand Texturing

Each individual shingle is hand textured to give the effect of weathered comb or of flat grain shingles. No two shingles are exactly alike. This prevents the mechanical effect which is noticeable in shingles which are cast in moulds from standard patterns.

3. Appearance and Mellowness of Age

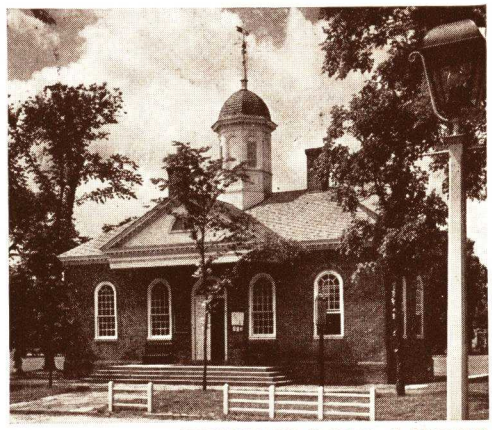
Both architects and laymen who walk past these Williamsburg shingled buildings are struck with the appearance of mellowed age of the roofs. The soft, warm, brownish black tone of the roof duplicates as closely as is possible that of old weathered shingles. When Mohawk *"Williamsburg"* shingles are under permanent shade of trees or in certain climates, they will even take on the mossy growth often seen on century-old wood shingles under these conditions.

4. A Fireproof Roof

It was necessary that the roofing material should be non-combustible. The asbestos fibre, cement and mineral color used in the *"Williamsburg"* Shingles are all non-combustible, therefore qualifying a *"Williamsburg"* roof for a grade "A" Underwriters' Protection.

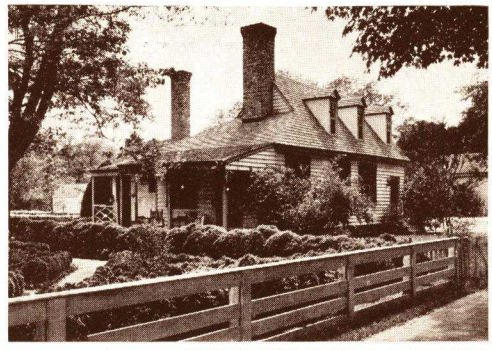
5. Permanency and Low Upkeep

The *"Williamsburg"* Shingles are tough, dense, yet not brittle. Homogeneous, they are without seams, ribbons or cleavages. Manufacture by a special process gives them qualities which make them last as long as the building. On exposure to the elements they acquire a flint-like hardness. Exceptionally low in degree of expansion and contraction with temperature change, they will not crack, spall, or break at nail holes. When laid in accordance with the Mohawk specification, they are warranted against breakage from heat or frost action for a period of fifteen years.

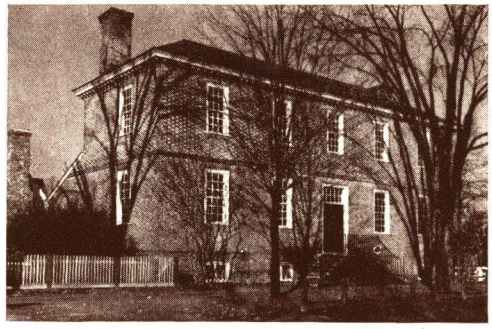


PHOTOGRAPH © BY F. S. LINCOLN
WILLIAMSBURG-JAMES CITY COUNTY COURT HOUSE OF 1770, WILLIAMSBURG, VA.

PHOTOGRAPH © BY F. S. LINCOLN
BLAIR HOUSE, WILLIAMSBURG, VA.

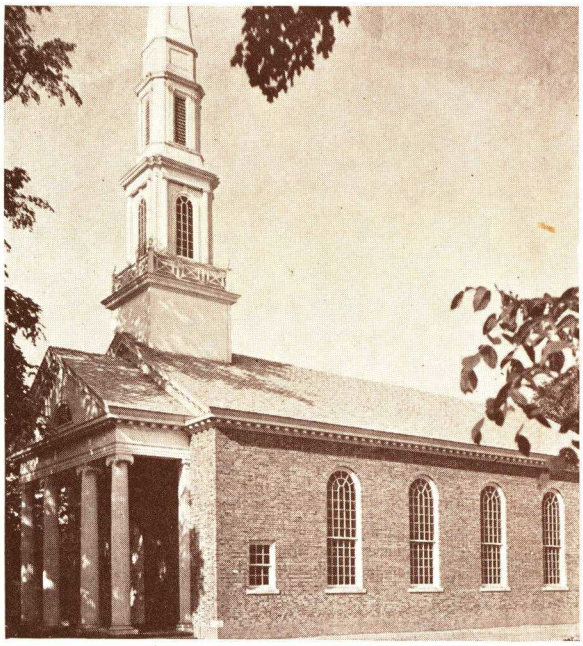


PHOTOGRAPH © BY F. S. LINCOLN
JAMES GALT HOUSE, WILLIAMSBURG, VA.



LUDWELL-PARADISE HOUSE, WILLIAMSBURG, VA.
Erected about 1717

ADAPTABILITY OF *Williamsburg* SHINGLES



FIRST PRESBYTERIAN CHURCH, LYONS, N. Y.
Architect, Roland S. Westbrook, Lyons, N. Y.

D. M. SPAIDAL RESIDENCE, GANANOQUE, ONT., CAN.
Architect, Electus D. Litchfield, New York, N. Y.

USED WITH NOTABLE SUCCESS BY MANY ARCHITECTS AND OWNERS

THE *"Williamsburg"* Shingles are ideally suited to Colonial, Georgian, Cape Cod, and Early American architecture, and have been so used on a great variety of work. In addition to Williamsburg itself and buildings illustrated on this page, a list of representative installations will be found on the back cover.

The *"Williamsburg"* differs from other shingles in that it gives, immediately, the effect of a wood shingle roof which has weathered. All the "newness" which is practically unavoidable with other roofing materials is missing. Although *"Williamsburg"* Shingles are hard, dense and fireproof; the surface appearance is soft, in contrast to the general hard, shiny appearance of quarried or mold patterned products. The hand textured finish makes the difference. The color is *permanent,* the coloring material is not a surface application, but is part of the shingle.

Sidewall Use

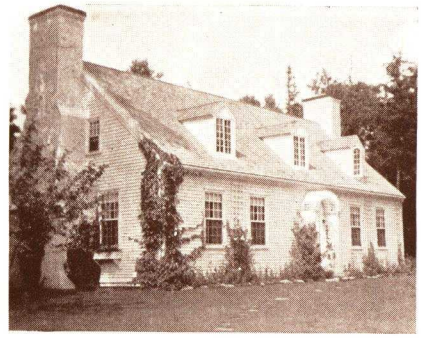
"Williamsburg" Shingles are excellently adapted to sidewall use, as well as roofs, as are also the Mohawk *Plymouth* Shingles (see page 6).

Re-roofing

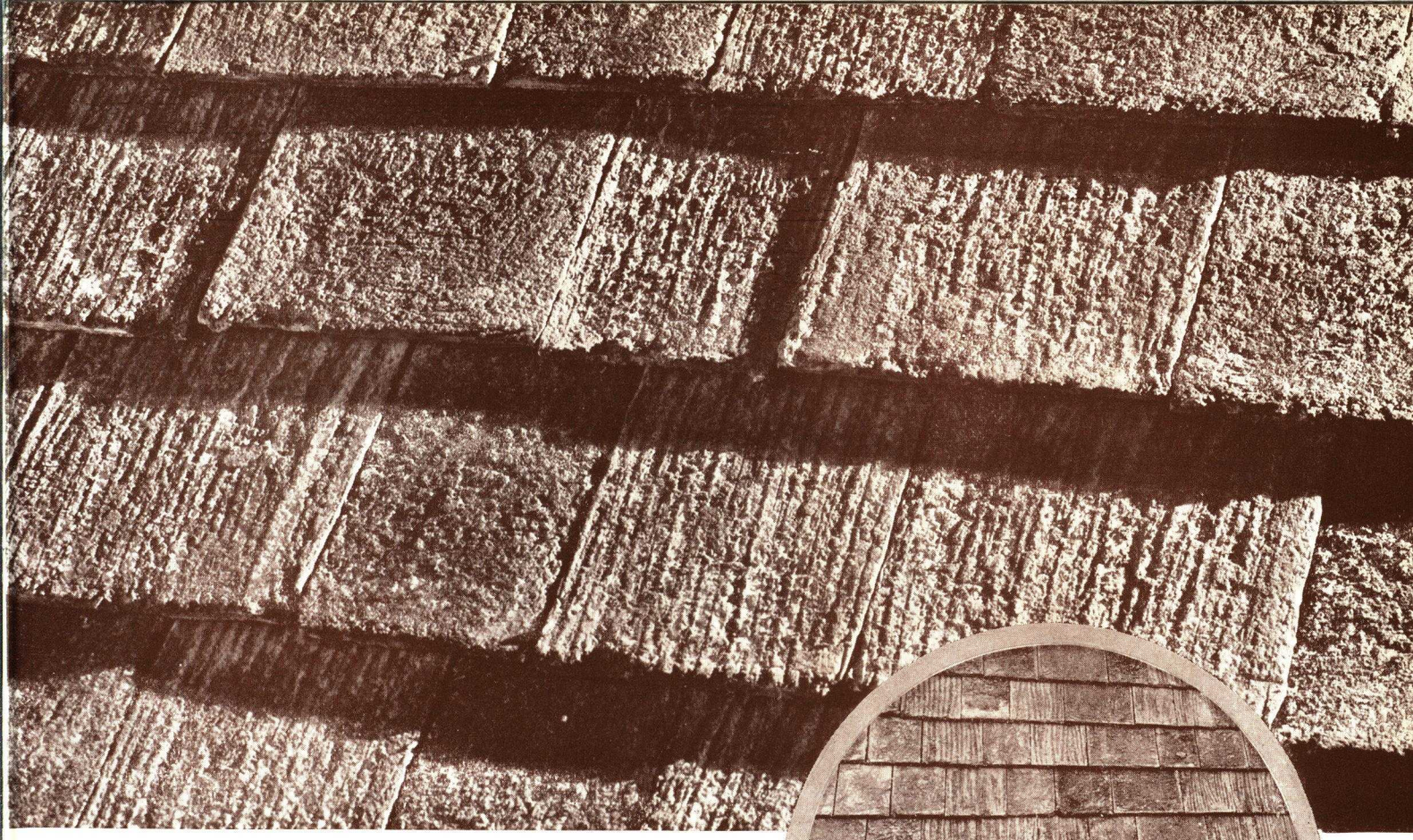
"Williamsburg" Shingles are lighter in weight than slate of equivalent thickness. They may be laid over old wood shingles to "last as long as the building."

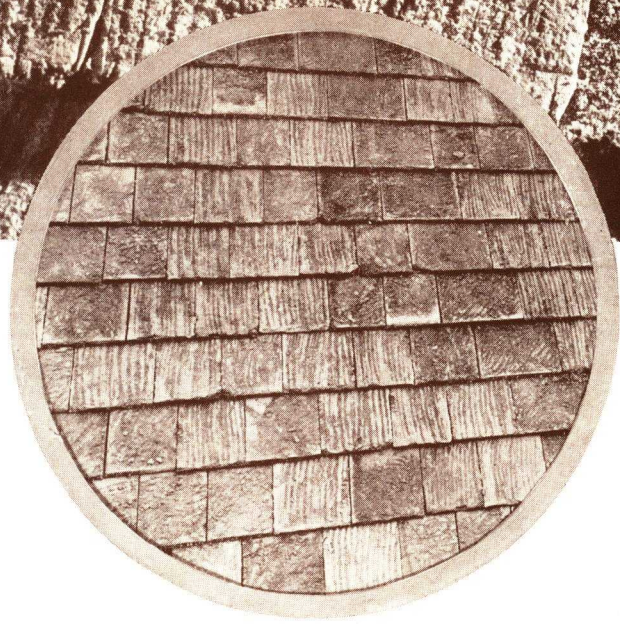
WM. M. ROBINSON RESIDENCE,
ROSS MOUNTAIN PARK, PA.
Architect, Louis Stevens, Pittsburgh, Pa.

KATONAH PUBLIC LIBRARY,
KATONAH, N. Y.
Architect, Kerr Rainsford, New York, N. Y.



MISS ELIZABETH H. PACKARD RESIDENCE,
SOUTHWEST HARBOR, ME.
Architect, Richard Derby, Boston, Mass.





Williamsburg

TAPERED ASBESTOS SHINGLES

The Fire-Safe Counterpart of Hand Split Wood

TEXTURE: As illustrated above, the beautiful effect of varied comb and cross grain patterns, in varied widths and purposely varied thicknesses to create an ideal play of light and shadow.

COLOR: Rich brownish black which at a distance gives such a color effect as your eye sees in the tree trunks of the forest . . . Other colors may be had as a special order and will require 6 to 8 weeks for shipment.

The pronounced taper and straight sides of the *"Williamsburg"* Shingles make them lay up tight—as will be noted above. A snugly laid roof prevents the entrance of snow and rain . . . *"Williamsburg"* Shingles are usually laid 7 inches to the weather.

DATA: *"Williamsburg"* Shingles listed in bold type are our standard manufacture for prompt shipment. The thicker butt sizes are made on order.

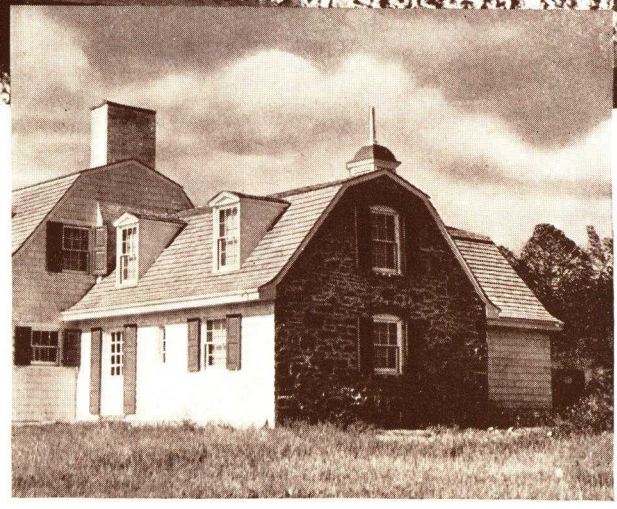
APPROX. THICKNESS	LENGTH	WIDTHS	APPROX. COUNT	WEIGHT PER SQUARE	
				C. L.	L. C. L.
⅜ to ½ inch	**16 inches**	**5, 6, 8 inches**	**319 per square**	720 lbs. Loose	780 lbs. Crated
⅝ to ¾ inch	16 inches	6, 8, 10 inches	260 per square	980 lbs. Loose	1060 lbs. Crated
⅞ to 1 inch	16 inches	6, 8, 10, 16 inches	227 per square	1400 lbs. Loose	1520 lbs. Crated

101 PARK AVENUE, NEW YORK, N. Y. — Factory, Oneida, N. Y.

Plymouth

TAPERED ASBESTOS SHINGLES

Cost Slightly Less than "Williamsburg" Shingles



HARRY HOUGH RESIDENCE, GALILEE, PA.
Architects, John M. Hatton and Ralph S. Myers, Associates, N. Y. C.

TEXTURE: They differ, also, in that they are hand textured to give the effect of edge grain shingles only. They are *tapered* in thickness, but of uniform 3/8 inch butts, and standard widths. The general texture is, therefore, more even than in the *"Williamsburg."*

COLOR: The weathered brown-gray color is lighter than that of the *"Williamsburg"* . . . Where a whitewashed shingle effect is desired, they may be painted with any of the paints made for this purpose.

ADAPTABILITY: The *"Plymouth"* Tapered Asbestos Shingles are applicable to the same styles of architecture as the *"Williamsburg."* Laid 7 inches to the weather.

The insert photograph of the residence above illustrates the use of *"Plymouth"* Shingles on both roof and side walls. The side walls, it will be noted, have been painted white to give the effect of whitewashed shingles.

DATA: The essential details are as follows:

APPROX. THICKNESS	LENGTH	WIDTHS	NO. PER SQUARE	WEIGHT PER SQUARE
3/8 inch	16 inches	6, 8, 10 inches	260	680 lbs. Loose (C.L.) 740 lbs. Crated (L.C.L.)

MOHAWK ASBESTOS SHINGLES, INC.

OTHER MOHAWK TAPERED ASBESTOS SHINGLES FOR COLORED ROOF EFFECTS

MOHAWK makes a complete variety of Tapered Asbestos Shingles which simulate the early weathered slate, stone and tile roofs appropriate to English, French, Georgian, Modern English and American architecture. Strength, lightness of weight, color and cost, are in their favor. Types in principal use are illustrated on this and the following page. Others can be manufactured to the architect's specification.

In designing some roofs of this nature it is practice to vary both the thickness and color of the shingles, with heavier butts and darker color values at the eaves, graduating to lighter tones and butt shadow lines at the ridges. The resultant effect is the concentration of mass and depth at the base, giving proper perspective and weathered beauty.

These shingles are colored in soft rich shades which can be used singly or which intermix without sharp contrast. The colors and proportionate color combinations are matters for the architect's choice.

The pronounced taper of these shingles assures a snugly laid roof, preventing the entrance of snow and rain.

Mohawk Tapered Asbestos Shingles of these types are all of lighter weight than other mineral roof units of the same thickness and require no more than ordinary roof construction. The coloring extends through the shingle; it is *not* a surface application.

MOHAWK STANDARD (Square Butts)

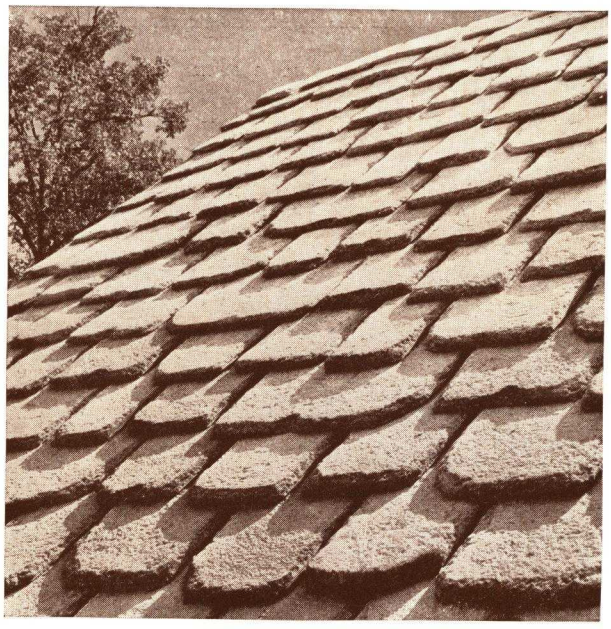
These shingles in 8 x 16 inch size, of 3/8 to 1/2 inch standard butt thickness are manufactured as a stock item. Colors are black, brown, purple, Acme red, buff, dark grey and light grey—in any single color, combination or percentage desired . . . Heavier butt thickness, or random 6, 8, 10 and 16 inch widths can be had on special order, as can also any special colors desired.

MOHAWK STANDARD (Rough Butts)

Similar in all respects, except butt finish, to the square-butt shingles at the left. Can be used alone or intermixed with the latter.

* * *

MOHAWK RUSTIC SHINGLES have rough butts and similarly roughened edges, for the effect often desired with Norman, Breton Cottage or Modern architecture. These are made only on order. Colors and sizes are the same as for Mohawk Standard Shingles.



MOHAWKSTONNE

Mohawkstonne

Duplicates the effects of old roofs in England and France, although lighter in weight, lower in cost, and readily cut for application. Produced in five soft stone tints intermixed at random: Bluestonne, Brownstonne, Buffstonne, Greystonne and Redstonne. Thicknesses vary from 1 in. to 3/8 in. Widths are random and its light weight—900 lbs. to the square—insures a low cost application.

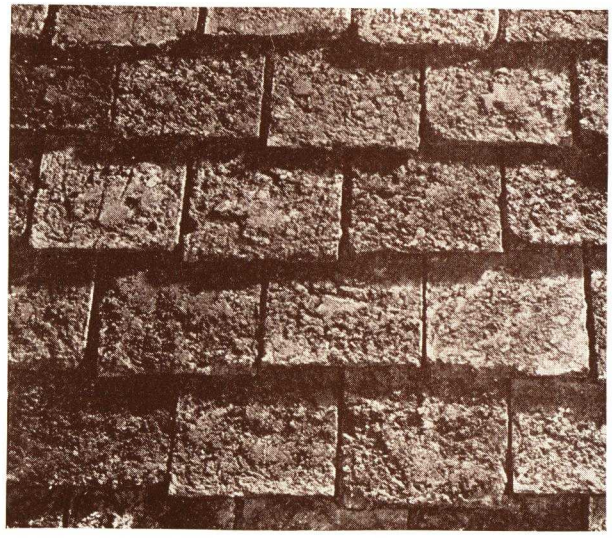
Mohawktyle

Possesses a rugged texture, worked by hand upon the tile while still in its plastic state. Colors vary from a soft black, through the medium tones of brown and dark red, siennas and clay. Provide roofs of rich color contrast.

Mohawktyle Antique

Representative of overburnt tyles of Yorkshire and Brittany. Blacks and browns, deep reds and the darker shades of tile and English red comprise the color range; successfully reproducing mellowed age. They give the impression of old hand-made tile, baked in twin formation and broken apart after being over-ovened.

MOHAWKTYLE



MOHAWKTYLE ANTIQUE

Instructions Regarding Storing and Laying of Mohawk Asbestos Shingles

Storage of Shingles — Material is piled on edge in car. Handle likewise in trucking and stacking on the job.

Pile shingles compactly on edge on planks with vertical support on both ends. Do not pile on the ground direct or over three rows high.

Cover fully with canvas or roofing felt until ready to apply.

No other material of any kind should be brought to bear upon piled shingles.

Use scaffold that does not rest entirely upon shingles. Ladder bracket scaffolds are suggested for starting at eaves and Ajax folding brackets for continuing up the roof. If the latter are not procurable, hand-made wood brackets with kickout straps of similar nature should be used. Ordinary tin straps which generally remain in the roof causing rust and corrosion stains will not be allowed. Roofer's runway should not bear directly upon shingles. Stage and space scaffolds so as not to walk on shingles at any time.

Special cutters are available with adjustable tapers and punches. These are manufactured by the Hoffert Machine Co., Racine, Wisconsin.

Read specifications for Mohawk Shingles thoroughly before application.

Specification and Method of Applying MOHAWK SHINGLES

1 General

1-1 **General Conditions** of the contract are hereby made a part of the contract. The contractor shall examine the General Conditions and acquaint himself with all requirements contained therein.

1-2 The contractor shall furnish all labor, material, equipment and services necessary and reasonably required to install the Mohawk Asbestos Shingles in accordance with the drawings and these specifications.

1-3 Asbestos shingles shall be applied by competent workmen.

1-4 **Inspection**—This contractor shall inspect all surfaces prepared by other trades to receive Mohawk shingles and report to proper authority any defects in the roof deck and shall not proceed with the laying of the felt, etc., until such defects are corrected.

1-5 **Guarantee**—A written guarantee shall be given by this contractor to maintain all asbestos shingled surfaces in a watertight condition for a period of . . . . . years from completion and that all materials used are in strict accordance with the specifications. All stains of any nature inclusive of those caused by other contractors shall be removed before his work is accepted.

1-6 **Work by Others**—Note the items not to be included in the specification in hand such as, other types of roof coverings, sheet metal work, waterproofing, roof drains, skylights, built-in flashings, etc.

1-7 **Carpentry**—Roof boards shall be well seasoned, narrow width T. & G. roofers laid in usual manner. Joists shall be broken and boards shall be securely nailed, leaving no loose ends.

1-8 **Nailing Strips** (on concrete or tile roof decks) shall be 1 x 2 in. wood strips, provided and laid by (designate roofing or carpenter contractor according to local procedure, preferably by roofing contractor).

1-9 **Cant Strip**—Of wood lath or other material ⅜ or ½ in. thick shall be furnished and laid at all eaves by carpenter. Also crickets shall be formed back of chimneys and wherever else required.

1-10 **Flashings**—The sheet metal contractor shall furnish 16-oz. soft rolled copper flashings as hereinafter required in these specifications to be built by the roofing contractor.

2 Roofing

2-1 **Scope of Work**—The entire surface of all pitched roofs (and sides of dormers) where indicated shall be covered with (Williamsburg, Plymouth, Standard or list other types of Mohawk Shingles) (state type, size of shingles, exposure, thickness, weight and color) as made by the Mohawk Asbestos Shingles, Inc., Oneida, N. Y.

Notes:

2-2 **Size of Shingles**—(Standard 8 x 16 in.) (Random width 5, 6, 8, 10 and 16 in.)

2-3 **Exposure**—(Standard 7 in.) Head lap (not less than 2 in.)

2-4 **Thickness and Weight**—Shingles shall be of standard thickness; average weight 680 lbs. per square.

2-5 **Color**—Shall be (as selected by architect). Color shall be properly mixed according to schedules given by (architect) (manufacturer). Care shall be taken, in laying shingles, that colors will be in harmony, avoiding checker board effect.

3 Application

3-1 **Roofing Felt**—Cover entire roof surface, where shingles are indicated, with one layer of (brand) asphalt saturated slaters' felt weighing not less than (state weight, 14, 30, 40 lbs.). Felt shall be laid horizontally, lapping joints at least 4 in., not less than 10 in. on hips and valleys, and lap 12 in. on vertical joints. All laps shall be well secured and felt shall be in perfect condition, free from holes or cracks when shingles are applied.

3-2 **For Concrete, Gypsum, Tile or Nailing Concrete**—Surface shall be covered with (brand) asphalt saturated roofing felt weighing 30 lbs. well mopped to the roof surface with hot asphalt, (state brand). All horizontal joints shall be lapped at least 2 in. and vertical joints 6 in.

3-3 **Shingles**—Apply starter course of shingles, cut 11 in. from butt parallel with the eaves, overhanging eaves 1½ in. and 1 in. at gable ends. Apply second course of shingles to cover the first course, carefully breaking joints. Proceed with the laying, exposing shingles (not more than) 7 in. to the weather and maintaining at least 2-in. head lap.

Note—If other than standard method of laying is desired, state character.

3-4 **Nails**—All shingles shall be fastened with two large head slaters' solid copper (or heavy galvanized) needlepoint nails of sufficient length to adequately penetrate the roof boards using not less than two to each shingle. Each shingle shall be nailed securely but not too tight and without excessive pressure resulting in bending of shingle. Care shall be taken that nails do not penetrate vital portion of flashing.

4 Flashings

4-1 The sheet metal contractor shall furnish 16-oz. soft rolled copper flashings to be built in by this contractor as follows:

4-2 **Dormer and Vertical Surface Flashings**—Base flashings shall extend not less than 6 in. vertically and at least 8 in. under slate. Counter flashings shall be applied by sheet metal contractor and made secure against leaks.

4-3 **Valleys**—Architect shall select type of valley to be used, and so specify.

4-4 **Open Valleys**—Flashings shall be 24 in. wide fastened securely only at the top.

4-5 **Closed Valleys**—Each course shall be slip flashed, lapping at least 2 in. and extending at least 1 ft. each side of valley.

4-6 **Round Valleys**—No copper flashing shall be required for round valleys, but all shingles shall be carefully fitted and embedded fully in elastic cement throughout.

4-7 **Hips and Ridges**—All hips and ridges shall be laid in elastic cement applied to unexposed parts of under courses of shingles and made watertight before applying hip or ridge roll or shingle. Special saddle hip shingles, for hips only, shall be laid two pieces to each course, exposed approximately 4½ in. to the weather.

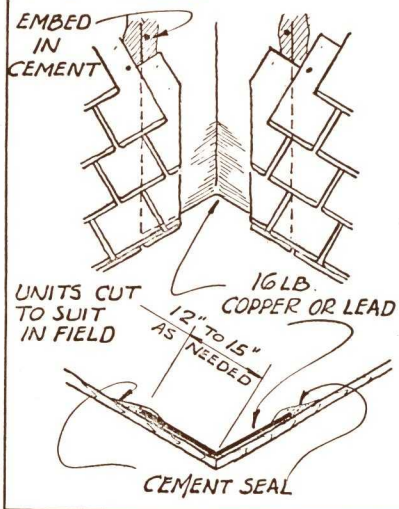
4-8 **Ridge Roll**—16-in. long, shall be laid with 13-in. exposure. In applying ridge roll, a 1 x 2 in. wood strip shall be nailed to top edge and ridge roll shall be nailed to the strip with 3-in. lap, using copper clips lapped over the butt of each section.

4-9 **Boston Ridges—Shingle Ridge**—Top edge of last course of shingles shall be made tight with elastic cement. Standard shingles 8 in. wide shall then be laid horizontally along the ridge with 7-in. lap, nailing twice and pointing nail holes with elastic cement. Top edge of shingles shall also be pointed with elastic cement.

4-10 **Boston or Mitered Hips**—These shall be of standard 8-in. wide shingles laid in elastic cement. Where random widths are specified. 16-in. wide shingles shall be used for mitered hips.

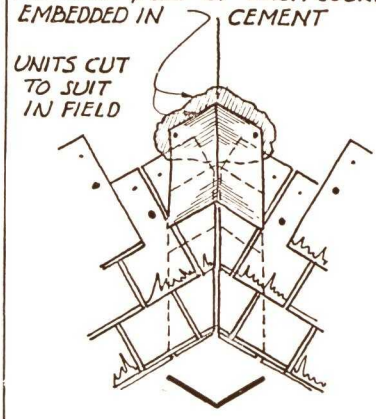
CONSTRUCTION DETAILS—VALLEYS & FLASHINGS

OPEN VALLEY



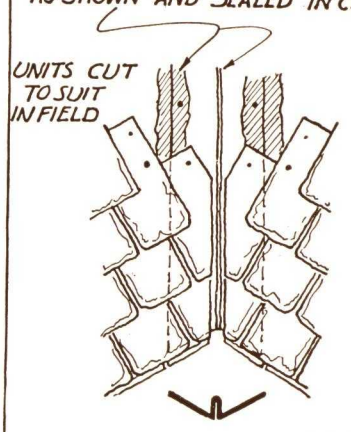
CLOSED VALLEY

16 OZ. COPPER FLASHING, CUT TO FIT EXPOSURE & LAP OF EACH COURSE, EMBEDDED IN CEMENT



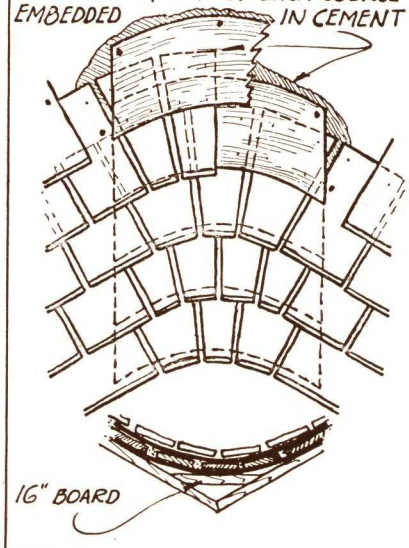
CLOSED VALLEY

16 OZ. COPPER FLASHING, CRIMPED AS SHOWN AND SEALED IN CEMENT

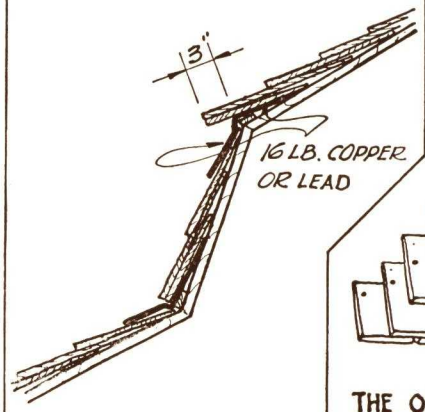


ROUND VALLEY

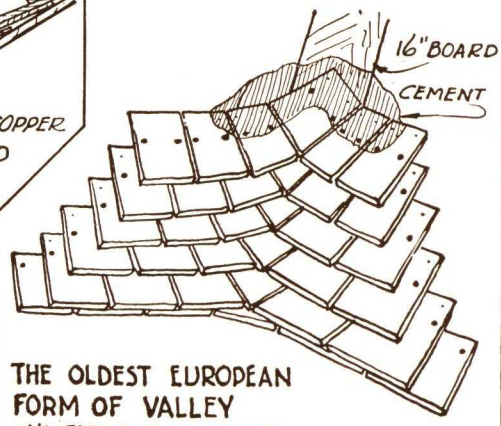
16 OZ. COPPER FLASHING, CUT TO FIT EXPOSURE & LAP OF EACH COURSE EMBEDDED IN CEMENT



GAMBREL AND BROKEN BACK

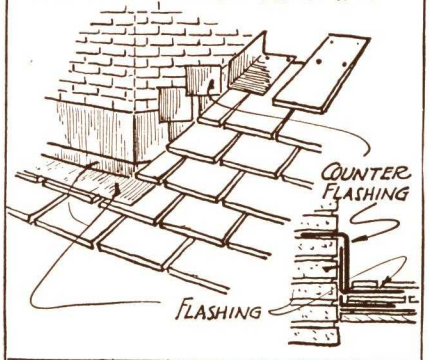


LACED VALLEY

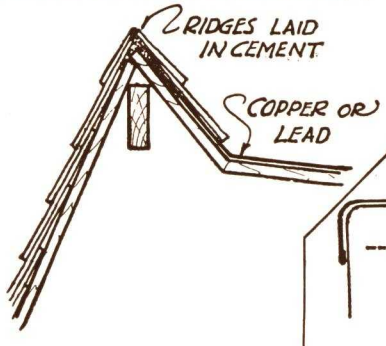


THE OLDEST EUROPEAN FORM OF VALLEY
NO FLASHING IS NEEDED

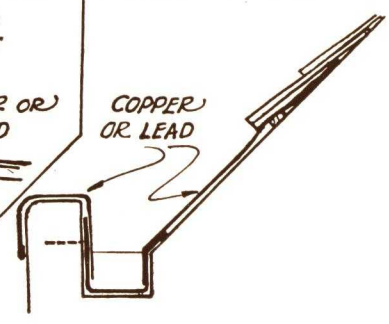
WALL AND CHIMNEY FLASHING



MANSARD AND METAL DECK



PARAPET DETAIL



FOR FURTHER FLASHING DETAILS ~SEE~ 12 h 1
COPPER & BRASS RESEARCH ASSOC. HANDBOOK.

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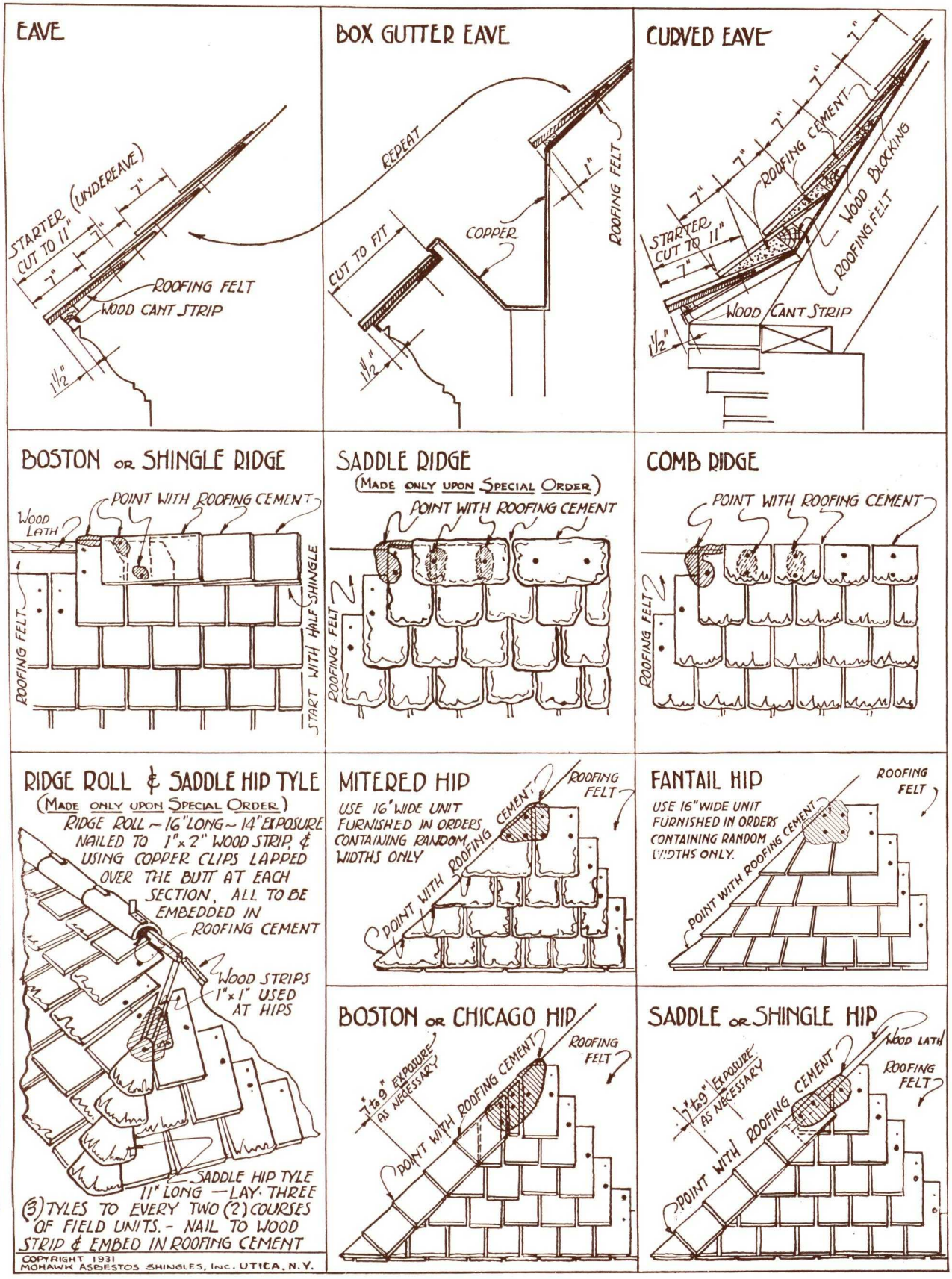
MOHAWK ASBESTOS SHINGLES, INC., UTICA, N.Y.

CONSTRUCTION DETAILS—EAVES, RIDGES, HIPS



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WEST WING OF RALEIGH TAVERN, WILLIAMSBURG, VA.

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TYPICAL INSTALLATIONS OF "WILLIAMSBURG" AND "PLYMOUTH" SHINGLES

CONNECTICUT

- Germain Hubby Residence, New Canaan, Conn.
  Archts., Robert E. Sherlock & Graham Hoyt, New York, N. Y.
- Southern New England Telephone Bldg., Orange, Conn.
- Dial Exchange Bldg., Southern New England Tel. Co., Old Greenwich, Conn.
  Archt., Douglas Orr, New Haven, Conn.
- Joseph Downs Residence, North Guilford, Conn.

KENTUCKY

- A. B. Gay Estate, Airdrie Farm, Spring Station, Ky.
  Archt., William G. Perry, Boston, Mass.

MARYLAND

- Miss Mabel Gillespie Residence, McDaniel Station, Md.
  Archt., Louis Stevens, Pittsburgh, Pa.

NEW JERSEY

- Morton L. Newhall Residence, Freehold, N. J.
  Archts., Wyeth & King, New York, N. Y.
- Edward H. Smith Residence, Westfield, N. J.
  Archt., Charles H. Darsh, Cranford, N. J.

NEW YORK

- Vanderbilt Webb Residence, Garrison, N. Y.
- ■ Frederick Formholz Residence, Hastings-on-Hudson, N. Y.
  Archt., John B. Peterkin, New York, N. Y.
- David Gerli Residence, Smithtown, L. I.
  Archt., Carl J. Jansen, New York, N. Y.

NEW YORK (*continued*)

- Mrs. Harry Payne Whitney's Residence, Old Westbury, L. I.
  Archts., Noel & Miller, New York, N. Y.
- Darwin James, Jr., Residence, Brookville, L. I.
  Re-roofing for existing wood shingles.

NORTH CAROLINA

- Manse, First Presbyterian Church, Winston-Salem, N. C.
  Archts., Northup & O'Brien, Winston-Salem, N. C.

OHIO

- R. A. Stranahan Estate, Toledo, Ohio.
  Archts., Mills, Rhine, Bellman & Nordhoff, Inc., Toledo, Ohio.

PENNSYLVANIA

- Bird-in-Hand Inn, Newtown, Pa., built in 1729.
  Restoration by Edward S. Barnslay, owner.
- Henry O. Rea Residence, Sewickley, Pa.
  Archt., James P. Piper, Pittsburgh, Pa.

SOUTH CAROLINA

- ■ F. S. VonStade Residence, Aiken, S. C.
  Archt., J. A. Murphy, Westbury, L. I.
- ■ Frederick W. DeFoe Residence, Andrews, S. C.
  Archt., W. L. Bottomley, New York, N. Y.

WASHINGTON, D. C.

- ■ Furniture Display Building, Washington, D. C.
  Archt., Arthur B. Heaton, Washington, D. C.

• indicates "Williamsburg Type" Shingles used. ■ indicates "Plymouth Type" Shingles used.

Asbestos-Cement

• SHINGLES •

Asphalt

RU-BER-OID

The Pioneer

The Ruberoid Co. pioneered the development of Asphalt Roofing Products. In 1892, when the first roll of Ruberoid Roofing was made by hand, it marked the birth of a new industry. Ruberoid engineers, since that time, have been constantly alert to maintain and improve the high quality and long service of Ruberoid products.

From one small factory with a limited number of products, The RUBEROID Co. has grown until today it is one of the largest manufacturers of roofing and allied building products in the world. Outside of its plants in foreign countries, it now operates ten great factories in the United States.

Today, The RUBEROID Co. manufactures a wide variety of quality building and maintenance products, of both asphalt and asbestos-cement, which are giving service in all parts of the world. A complete listing and description of some of these products is contained in this catalog.

Ruberoid plants are strategically located throughout the country. Its divisional sales offices are manned by executives who have full and complete authority over their divisions. Only the most fundamental questions of general policy are dictated from the head office. A factory produces the goods shipped in a limited area under the supervision of a capable staff at an office in each division.

THE RUBEROID CO.

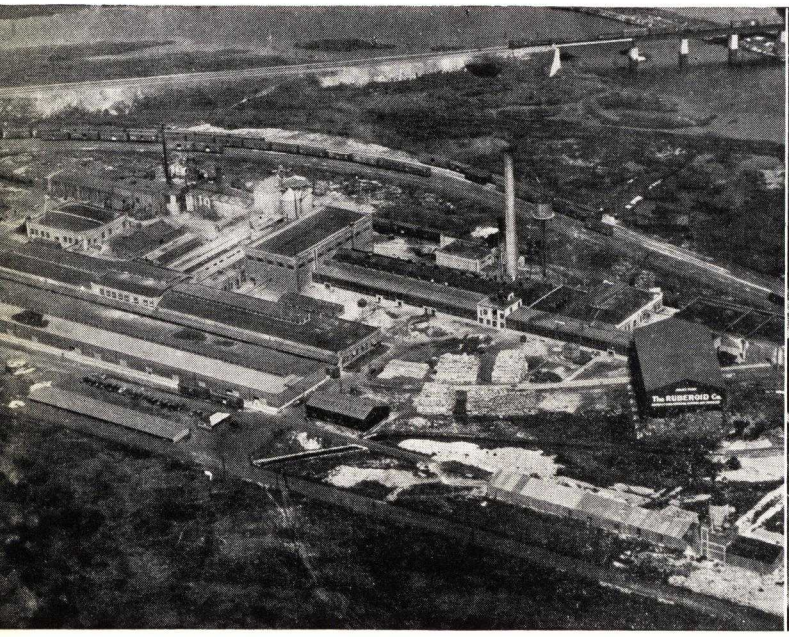
DIVISIONS

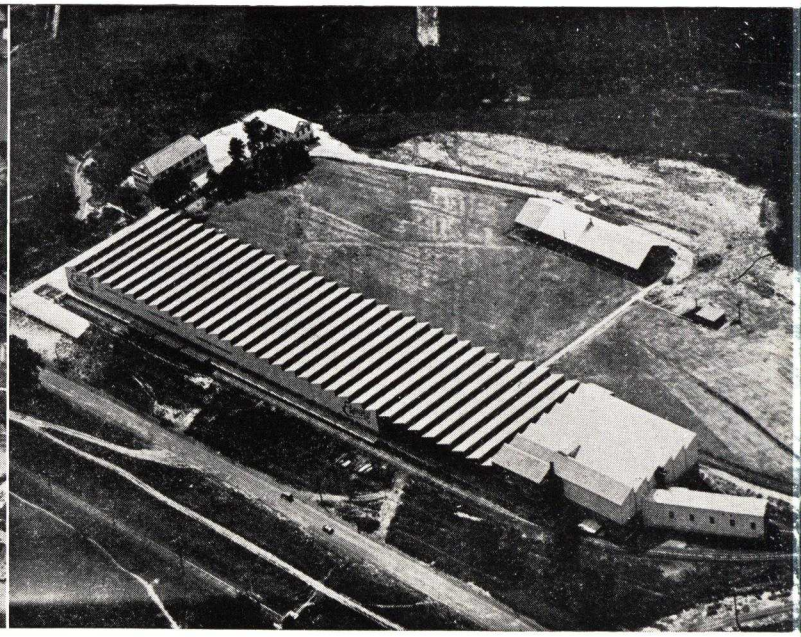
CONTINENTAL ETERNIT SAFEPACK
H. F. WATSON

OFFICES

NEW YORK CHICAGO BOSTON (MILLIS) ERIE
BALTIMORE MOBILE MINNEAPOLIS

Samples and descriptive literature of any product made by The Ruberoid Co. will be gladly sent on request.





TWO OF TEN MODERN PLANTS WHERE RUBEROID PRODUCTS ARE MADE

ETERNIT ASBESTOS-CEMENT PRODUCTS . . .

RUBEROID-ETERNIT Asbestos-cement Shingles are made of Portland Cement and Asbestos Fibres, carefully combined by an ingenious building up process which insures an even distribution of the reinforcing fibres throughout the finished shingle, and results in remarkable strength and resiliency. When finally subjected to tremendous hydraulic pressure, they acquire great density, becoming waterproof, as well as fireproof. Eternits are as truly an ageless product as the name implies.

ETERNIT Asbestos-cement Shingles are made in a wide variety of shapes, textures and colors—each one adaptable to some particular architectural style, or the property owner's pocketbook. They are as well suited for re-roofing over old shingles and for residing over old clapboards, stucco or other material as for new work. Colors are pure mineral oxides and are an integral part of each shingle. All ETERNIT Shingles bear the Underwriter's Laboratories, Inc. Label.

ETERNIT GOTHIC SHINGLES FOR ROOFS No. 200

The Gothic has age-old architectural charm in its rugged rock-like texture and soft, mellow colors. The texture is like that of natural rock in which has been carved by years of exposure to the elements fascinating designs such as only nature itself can produce. The luxurious appearance is duplicated only in the most expensive types of natural slate or stone.

Tapered with a heavy butt, the Gothic shingle lays perfectly on the roof and casts shadow lines which give the effect of massiveness without the burden of extra weight in the shingle itself which would necessitate an expensive supporting structure.

Furnished in random widths and designed so that it can be applied with staggered butts, the Gothic offers unusual opportunities for individuality in roof design both from the standpoint of roof lines and color blending.

The Gothic Shingle is equally suitable for old or new work.

COLORS

Dark Green	Quarry Blue	Purple
Jade Green	Colonial Gray	Buff
Tile Red	Slate Gray	Weathered Copper
	Dark Brown	

SPECIFICATIONS

Full size shingles—12 in. wide by 16 in. high.

Random widths—5, 6 and 7 in.

Tapered with approximately 5/16 in. butts.

Applied with 7 x 12 in. exposure; spaced 1/8 in. apart.

Shingles per Square: 171.

Approximate Weight per Square: 525 lbs.

Packaged 9 bundles containing 19 shingles each.

For finishing Hips and Ridges: 6 in. wide shingles in Boston Hip Method, with 7 in. exposure.

Completing Materials: 2 lbs. 1½ in. Galvanized Needle Point Nails.

(Use 2 in. nails for applying over old shingles.)

Underwriter's Label Class "A"

RANDOM WIDTH SHINGLES No. 201

Gothic Random Width Shingles are available in 5, 6 and 7 in. widths in the same colors as regular Gothics.

There are 342 random width shingles per square (18 bundles of 19 shingles each).

Weight approximately 525 lbs. per square.

Where 5 in. and 7 in. shingles are used, equal quantities of each must be ordered.

Completing materials: 3½ lbs. 1½ in. galvanized needle point nails.

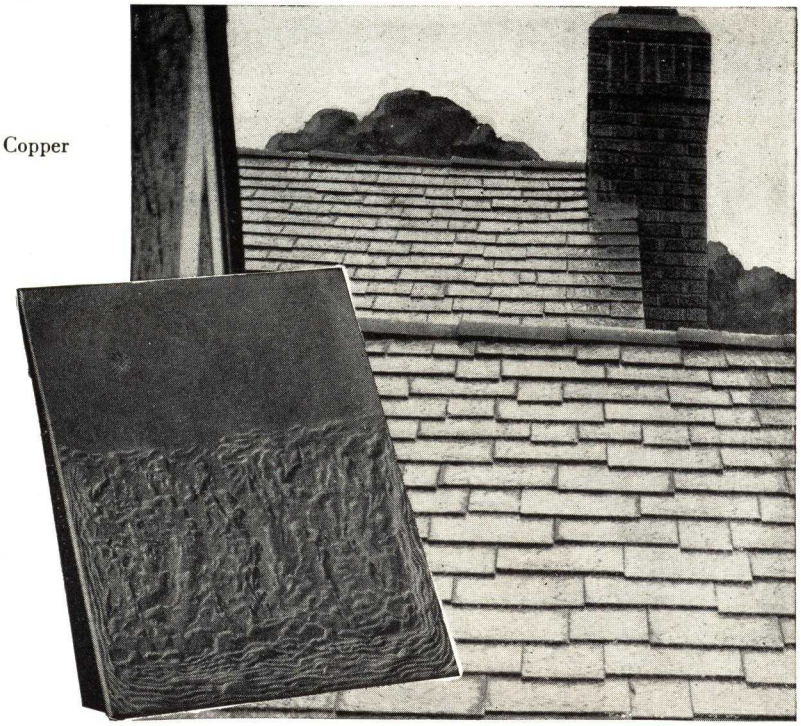
HIP AND RIDGE SHINGLES No. 202

Hips and Ridges are finished with 6 in. wide Gothics specially designed for this purpose. They are applied by the Boston Hip Method with a 7 in. exposure.

342 shingles, weighing approximately 525 lbs. are required to cover 100 lineal feet of ridge in this manner.

Packed in 18 bundles of 19 shingles each.

Gothic Hip and Ridge Shingles are available in the same colors as Gothic Shingles No. 200.



TIMBERTEX ASBESTOS . . .

AMERICAN METHOD—No. 203

Eternit Timbertex American Method Shingles faithfully reproduce the texture of weather-aged cypress. For many years the charm and beauty of wood shingles have been beloved in American residential architecture. That these characteristics have been retained in a shingle that is fireproof and durable to the extent of being practically everlasting, is an outstanding achievement of architectural and mechanical skill.

Tapered in shape, Timbertex Shingles lay perfectly snug and tight to the roof, giving maximum protection against the weather. The heavy butts produce attractive shadows and, when laid with straight or slightly staggered alignment, the effect is that of mellowed wood with colors softened and made richer by the finely etched texture. The colors are an integral part of each shingle; painting or staining is not required.

Double sets of punched nail holes permit the laying of irregular shingle courses, providing interesting roof lines. Timbertex Shingles are ideal for new roofing, or they may be applied with 2 in. nails right over old shingles.

COLORS

Weathered Copper	Jade Green	Slate Gray
Dark Brown	Tile Red	Colonial Gray
Dark Green	Quarry Blue	Cypress Brown

SPECIFICATIONS

Size 8 in. x 16 in.—approx. ¼ in. thick butt.. . Exposure 8 in x 7 in.
Shingles per Square..... 260
Bundles per Square..... 10
Approximate weight per Square.....525 lbs.

Completing Materials: 2½ lbs. 1½ in. Galvanized Needle Point nails. (Use 2 in. long nails for applying over old shingles.)

Underwriter's Label Class "A"

TIMBERTEX HIP AND RIDGE SHINGLES No. 211

These shingles are uniform standard thickness, and are for use with all shingles except Gothics.

SPECIFICATIONS

Size—16 in. long by 4⅝ in. to 5⅜ in. tapered width. Applied with 7 in. exposure.

342 Pieces per 100 lineal ft., of 18 bundles of 19 pieces each.

Approximate Weight: 325 lbs. per 100 lineal ft.

COLORS

Colonial Gray	Cypress Brown	Polychrome
Quarry Blue	Slate Gray	Jade Green
	Tile Red	

Completing Materials: 3½ lbs. of 1½ in. Galvanized Needle Point Nails.

"CLOSEUP" OF AMERICAN METHOD SHINGLE AND SECTION OF ROOF SHOWING THE ATTRACTIVE HEAVY SHADOW LINES

. . . CEMENT ROOFING SHINGLES

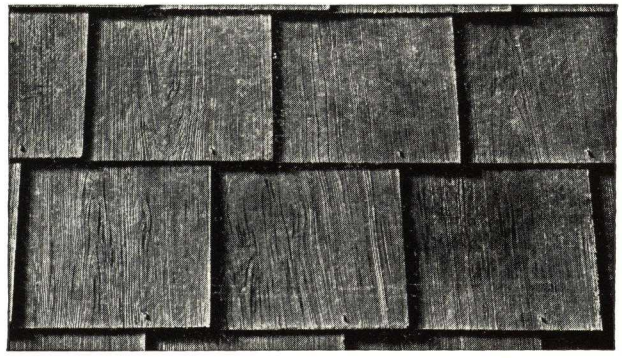
DUTCH LAP METHOD No. 210

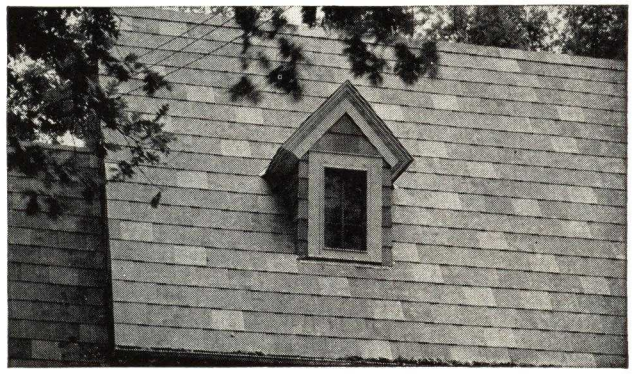
Eternit Dutch Lap Shingles have the "weathered cypress" texture and roof lines of "American Method" shingles. This ingenious design, however, effects great economy in the cost of the finished roof.

The method of application follows the principle of having both a headlap and sidelap for protection. It has been employed for many years in the application of certain types of roofing material and has been proven entirely satisfactory.

For small homes, where massiveness is not paramount, or for re-roofing, this shingle lends itself admirably.

The Dutch Lap Timbertex is particularly recommended to those who would have the best in quality and appearance, and to whom economy in cost is an important consideration.





COLORS

Jade Green	Quarry Blue	Cypress Brown
Tile Red	Colonial Gray	Polychrome
	Slate Gray	

SPECIFICATIONS

Size.....16 in. x 16 in. x $\frac{5}{32}$ in. thick
Headlap..... 3 in. Sidelap..... 4 in.
Exposure.....13 in. x 12 in.
Shingles per Square..... 92*
Bundles per Square..... 4
Approximate Weight per Square.....275 lbs.

**Actual coverage 99 2/3 sq. ft. Prices quoted on this basis.*
Also applied with 5 1/3 in. sidelap requiring 104 shingles per square.
Use 4 in. x 16 in. eave starters.

Completing Materials: 92 Copper Storm Anchors, $\frac{4}{5}$ lb. $1\frac{1}{4}$ in. Galvanized Needle Point nails. (Use $1\frac{1}{2}$ in. galvanized nails for applying over old shingles.)

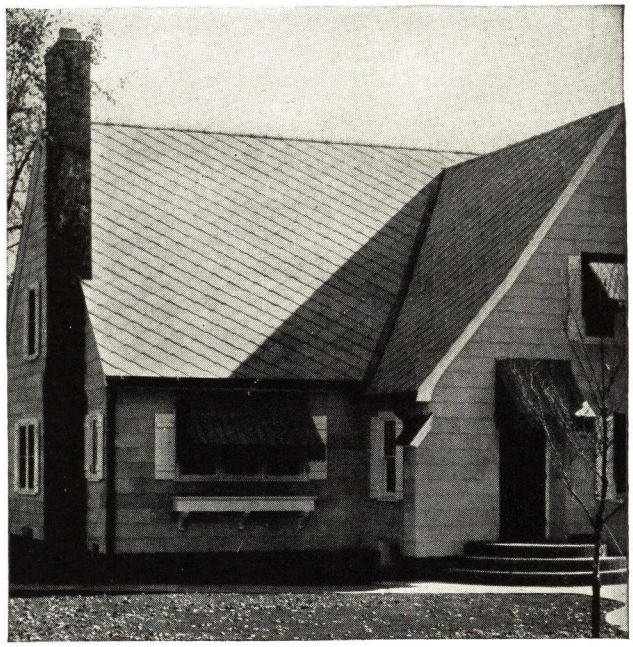
Underwriter's Label Class "B"

HEXAGONAL ASBESTOS—CEMENT SHINGLES

For many years the Hexagonal or honeycomb design has been associated with Asbestos-cement Shingles, for it was in this design that this particular type of roofing material first became popular. Although pleasing and unique in appearance, the Hexagonal Shingle owes its popularity chiefly to economy in price. It is designed so that only a minimum amount of material is required for overlapping, and while efficient from the standpoint of being absolutely weatherproof when used under proper conditions, it effects a maximum saving in labor and materials and consequently makes a finished, enduring, fireproof roof at low cost.

Eternit Hexagonals are smooth surfaced, but are produced in the same beautiful and lasting colors as the more expensive textured shingles.

They are adaptable for re-roofing and re-siding as well as new work.



COLORS

Tile Red	Jade Green	Polychrome
Quarry Blue	Colonial Gray	Pastel (Red and Blue)
	Mottled Gray	

SPECIFICATIONS

Size.....16 in. x 16 in. approx. $\frac{5}{32}$ in. thick
Headlap .....3 in.
Exposure.....13 in. x 13 in.
Shingles per Square..... 86
Bundles per Square.....4⅓
Approximate Weight per Square.....260 lbs.

Completing Materials: 86 Copper Storm Anchors, $\frac{3}{4}$ lb. $1\frac{1}{4}$ in. Galvanized Needle Point nails. (Use $1\frac{1}{2}$ in. Galvanized nails for applying over old shingles.)

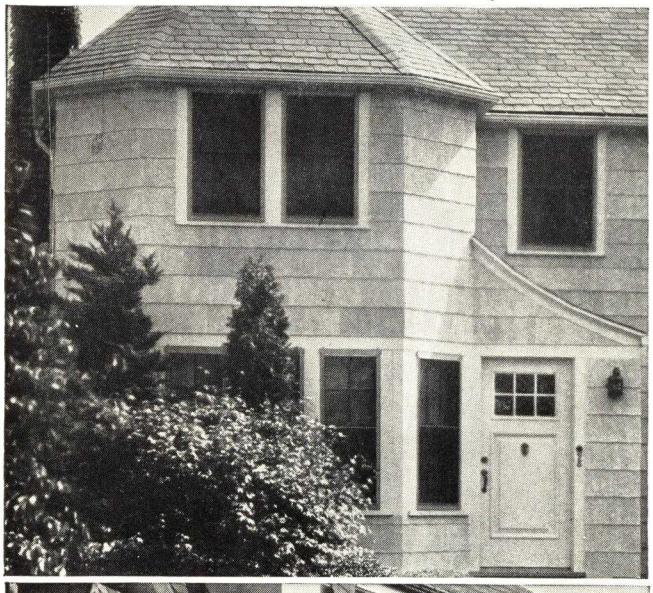
Use 16 in. Hexagonal Starters for eave course.

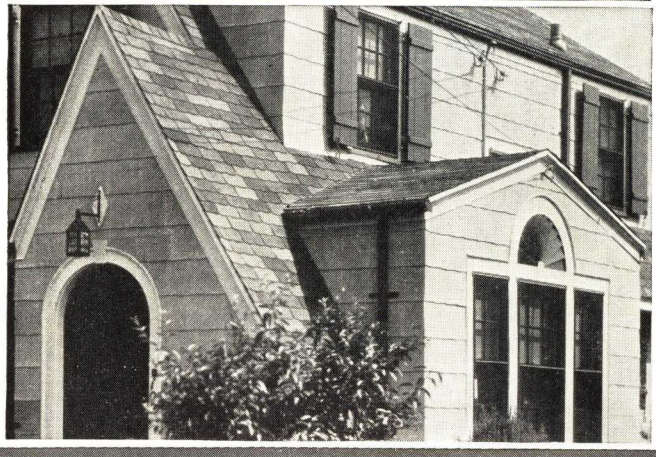
60 pieces per 100 ft.—3 bundles—wgt. 115 lbs. per 100 ft.

Underwriter's Label, Class "B"

ETERNIT ASBESTOS . . .

COLONIAL TIMBERTEX SIDING





Eternit Colonial Timbertex Asbestos-Cement Siding is furnished in two sizes: 12 in. x 24 in., and 9½ in. x 24 in. Both are equally efficient for new construction or re-siding old buildings. Its texture exactly reproduces the graining of natural weather-aged cypress. Each shingle is made of Portland cement and long asbestos fibres, providing a rot-proof, fireproof, time-defying siding.

The attractive "wood colors" are an integral part of each shingle. Painting or staining is never required to preserve the shingles.

On new construction, Colonial Timbertex Siding is applied right over the board sheathing or insulation. When applied over clapboard, stucco, or brick, Colonial Timbertex Siding affords increased insulation. This is made possible by the dead air space between the old siding and the new.

The beauty of this siding, reproducing the charm of cypress, its economy of application, and the savings in upkeep, have made it one of the most popular sidewall products.

The shingles are so designed that perfect alignment and absolutely tight nailing are assured.

COLORS

Steel Gray	Cypress Brown	Sno-White
Silver White		Lawn Green

SPECIFICATIONS — No. 244

Size.....12 in. x 24 in. x $\frac{5}{32}$ in. thick

Headlap	1½ in.
Exposure	10½ in. x 24 in.
Shingles per Square	57
Bundles per Square	3
Approximate Weight per Square	195 lbs.

Accessories Per Square: 60 Asphalt Roofing Joint Strips—3 in. x 12 in., to be used underneath shingles where they butt together and sufficient Special Facing Nails, furnished without extra charge.

Completing Materials: 1 lb. 1½ in. Galvanized nails for Concealed Nailing, 171 nails per square—3 per shingle.

SPECIFICATIONS — No. 248

Size.....9½ in. x 24 in. x $\frac{5}{32}$ in. thick

Headlap	1½ in.
Exposure	8 in. x 24 in.
Shingles per Square	75
Bundles per Square	3
Approximate Weight per Square	200 lbs.

Accessories Per Square: 75 Asphalt Roofing Joint Strips—3 in. x 9½ in., to be used underneath shingles where they butt together and sufficient Special Facing Nails furnished without extra charge.

Completing Materials: 1½ lbs. 1½ in. Galvanized nails for Concealed Nailing.....3 per shingle

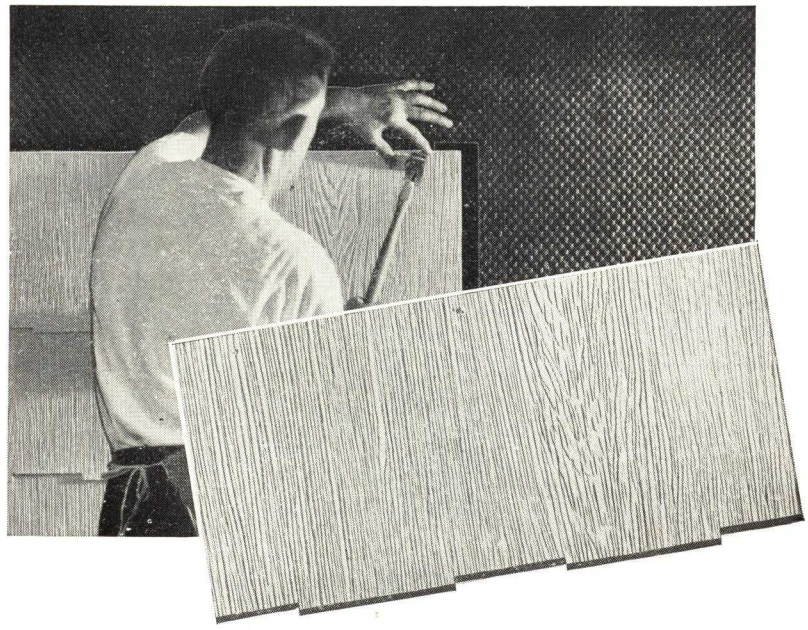
. . .CEMENT SIDING SHINGLES

THATCH TIMBERTEX SIDING

Eternit Timbertex Thatch Siding offers the architect an ideal method of permanently beautifying new or existing walls at low cost. Its advantages include reduction of up-keep expense and heating costs, and permanent fire protection.

This Asbestos-cement Siding Shingle because of its "wood" textured surface and irregular butt line, perfectly reproduces the effect of weathered cypress shingles, applied in the "thatch" method.

Furnished in two sizes—12 in. x 24 in. and 9½ in. x 24 in., this shingle is unusually economical to apply.



COLORS

Steel Gray Silver White Sno-White

SPECIFICATIONS — No. 246

Size.....12 in. x 24 in. x $\frac{5}{32}$ in. thick

Minimum Headlap 1⅜ in. Maximum Headlap 1½ in.
Exposure.....10½ in. x 24 in.
Shingles per Square.....57
Bundles per Square..... 3
Approximate Weight per Square.....195 lbs.

Accessories Per Square: 57 Asphalt Roofing Joint Strips—3 in. x 12 in., to be used underneath shingles where they butt together and sufficient Special Facing Nails furnished without extra charge.

Completing Materials: 1 lb. 1½ in. Galvanized nails for Concealed Nailing.....3 per shingle

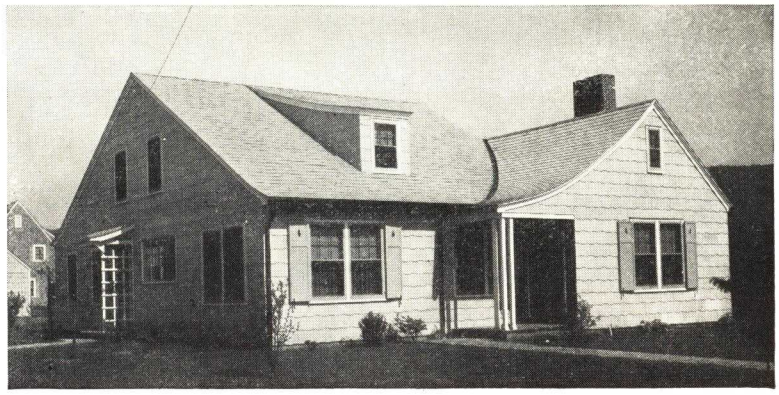
SPECIFICATIONS — No. 247

Size.....9½ in. x 24 in. x $\frac{5}{32}$ in. thick

Minimum Headlap 1⅜ in. Maximum Headlap 1½ in.
Exposure.....8 in. x 24 in.
Shingles Per Square.....75
Bundles per Square..... 3
Approximate Weight per Square.....200 lbs.

Accessories Per Square: 75 Asphalt Roofing Joint Strips—3 in. x 9½ in., to be used underneath shingles where they butt together and sufficient Special Facing Nails furnished without extra charge.

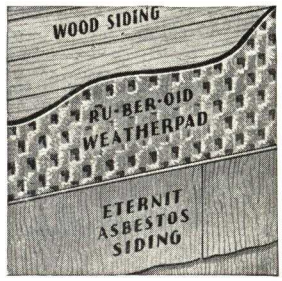
Completing Materials: 1½ lbs. 1½ in. Galvanized Nails for Concealed Nailing—3 per shingle.



WEATHERPAD SHEATHING

Ruberoid Weatherpad consists of an indented, heavy rag-felt coated with asphalt on one side to make it waterproof and surfaced on the under side with ground cork.

It has been tested and proven to be a highly efficient heat insulation and sound deadener when used as a companion product to Siding Shingles. Weatherpad materially increases the sound insulation of ordinary frame construction.



Though particularly designed for use under Asbestos Shingles, Weatherpad Siding is equally good under Asphalt Shingles, or for general sheathing and sound deadening purposes.

Weatherpad is easily applied and does not lengthen the time required to apply new siding. It is treated to resist the activities of vermin, termites and other insects. 30 lbs. per 100 sq. ft. roll, 36 inches wide.

ETERNIT ASBESTOS—CEMENT BRICK—TYPE SIDING

Asbestos-cement Brick-type Siding is a rigid three-in-one strip designed for use on sidewalls. It gives the appearance, and many of the advantages, of brick veneer, at low cost. It is equally adaptable for new construction or for application over old sidewalls.

The "wire cut" texture with each individual "brick" set out from the recessed mortar joints gives a remarkable reproduction of a brick sidewall. Special corner pieces mitred to a perfect fit, and soldier courses for use at the base and over windows, plus the stony hardness of the material, enhance the perfect brick-like appearance.

Age-enduring cement and fireproof asbestos guarantee weather protection, reduce fire hazards, eliminate frequent paintings, increase comfort through insulation, and lower fuel costs.

Asbestos-cement Brick-type Siding may be had in both Redtone and Bufftone, the most popular brick colors.

SPECIFICATIONS — No. 250

Size of Strips.....6¼ in. x 30 in. (3 bricks 2½ in. x 9½ in.)
Exposure.....3 in. x 30 in. with ½ in. mortar line
Strips per Square.....160
Bundles per Square..... 4
Approximate Weight per Square.....360 lbs.

Completing Materials: Completing materials required: 3¼ lbs. 1½ in. Nails.

CORNER PIECES No. 251

(Special Cut with Mitred Corner Edge.)

For use for finishing corners on Asbestos Brick-type Siding.

Right and Left Side Longs: 6¼ in. x 30 in. (3 bricks per strip), 81 lbs. per bundle or 9 lbs. per lineal ft.

Right and Left Side Shorts: 6¼ in. x 15 in. (1½ bricks per strip), 40 lbs. per bundle or 9 lbs. per lineal ft.

SOLDIER COURSE No. 252

For use as bottom course over windows, etc., with Asbestos Brick-type Siding.

Pieces: 6¼ in. x 10 in. (1 brick 2½ x 9½ in.), Exposure 3 in. x 9½ in. with vertical mortar lines, weight 2¾ lbs. per lineal ft. (4 pieces). 40 pieces or 10 lineal ft. per bundle. 4 lbs. of 1½ in. nails per 100 lineal feet.

STARTER FILLER STRIP No. 253

For use under first course of Asbestos Brick-type Siding to give the proper cant.

Pieces 3½ in. x 30 in., 40 pieces per bundle and per 100 lineal feet, 50 lbs. per 100 lineal feet. Exposure ½ in. by 30 ins. ¾ lb. of 1½ in. nails per 100 lineal feet.

ASBESTOS—CEMENT WEATHERBOARD SIDING

One of The Ruberoid Co.'s newest products is Sno-White Asbestos-Cement Weatherboard Siding. This product, which is ideal for new construction work as well as for modernization, has a smooth surface and is rotproof, fireproof, termiteproof, and never requires paint.

Asbestos-Cement Weatherboard is made in 2-ft. lengths 9½ or 12 in. wide, $\frac{5}{32}$ in. uniform thickness. The headlap is 1½ in., exposure 8 or 10½ in. 75 or 57 shingles are required per 100 sq. ft. area. Packaged in 3 bundles, and the approximate weight is 195 or 200 lbs. per square. Sufficient 3 in. x 9½ in. or 3 x 12 in. felt joint strips and face nails are furnished without extra charge. Completing materials required: 1 lb.—1½ in. Galvanized N.P. Nails, for both 9½ in. and 12 in. width shingles.

RUBEROID

ASPHALT PRODUCTS

Ruberoid Roofs on homes, schools, churches, hotels, museums, offices, industrial and farm buildings have made good in every corner of the globe, regardless of climatic or weather conditions.

RUBEROID ASPHALT SHINGLES, unit and strip, for roofing and siding, are made in several styles and many harmoniously blended colors. A few of these are described in the following pages. Complete, detailed information is available on request. Asphalt Shingles may be used on any roof with a pitch of six inches or more to the foot. They cannot be used on flat roofs. They are generally adaptable for new construction and for re-roofing and re-siding.

RUBEROID ROLL ROOFING is made with smooth or mineral surfaces in numerous grades and weights. There is a weight and grade of Ruberoid Roll Roofing to meet every building and economic need.

For Built-up Roofing, see separate catalog in Sweet's.

RUBEROID ASPHALT SHINGLES

THICK BUTT SQUARE-TABS — WOOD GRAIN TEXTURED OR MINERAL SURFACED

(Standard Weight)

12 in.—No. 25. The exposed area of Thick Butt Square-Tabs is of double thickness, affording extra weather protection, deep shadow lines and extra beauty. Available in two finishes—wood grain textured and mineral surfaced without texture. There is a wide variety and choice of attractive colors and color blends.

15 in.—No. 27. Similar to the 12 inch shingle, but with the added advantage of additional weight and greater headlap protection.

SPECIFICATIONS

	12 in.	15 in.
Strips per Square	80	80
Shingles per Strip	3	3
Size each Strip	12 in. x 36 in.	15 in. x 36 in.
Headlap	2 in.	5 in.
Exposure	5 in.	5 in.
Average approximate Weight per Square	210 lbs.	250 lbs.
Bundles per Square	3	3

Underwriter's Label Class "C"

MASSIVE UNIT No. 50

Jumbo Weight

This shingle has been applied on some of America's finest homes. The extra size, extra weight, extra rigidity and extra large headlap of this shingle provide unusual protection against leakage and assure durability. Because of its wide over-lapping the massive unit gives two thicknesses over the entire roof area and three thicknesses at the butts where the wear is hardest. Ideal for new construction, for application over old shingles and for re-siding. Made in a variety of attractive colors.

SPECIFICATIONS

Shingles per Square	228
Size each Shingle	12 in. x 16 in.
Headlap	6 in.
Exposure	5 in.
Average Approximate Weight per Square	325 lbs.
Bundles per Square	4

Underwriter's Label Class "C"

CLOSE-UP OF THICK BUTT SQUARE-TAB SHINGLES — WOOD GRAIN TEXTURE

RUBEROID ASPHALT SHINGLES

MASSIVE SQUARE-TABS No. 20
12 in. (Jumbo Weight)

A true "heavy weight" among asphalt strip-shingles, these Square-Tabs possess many excellent qualities. They are massive in appearance, 40% thicker than the ordinary asphalt strip-shingle, have tremendous strength and give complete weather protection.

They are especially adapted for use on new construction, for application over old roofs and for re-siding. You have a wide choice of colors and color blends.

SPECIFICATIONS

Strips per Square	80
Shingles per Strip	3
Size each Strip	12 in. x 36 in.
Headlap	2 in.
Exposure	5 in.
Average Approximate Weight per Square	257 lbs.
Bundles per Square	3

Approved by the Board of Fire Underwriters, Inc. (Class C Label)

CLOSE-UP OF MASSIVE SQUARE-TABS

MASSIVE HEX-STRIP No. 10
(Jumbo Weight—2⅝ in. Headlap)

Massive Hex-strip Shingles are truly giants in size and thickness and in their appearance on the roof. They are nearly twice as thick as ordinary shingles. This extra "massiveness" doubles their protective qualities and produces heavy shadow lines. Available in many beautiful colors and blends.

SPECIFICATIONS

Strips per Square	76
Shingles per Strip	2
Size each Strip	13⅛ in. x 36 in.
Headlap	2⅝ in.
Exposure	5¼ in.
Average Approximate Weight per Square	217 lbs.
Bundles per Square	3

Approved by the Board of Fire Underwriters, Inc. (Class C Label)

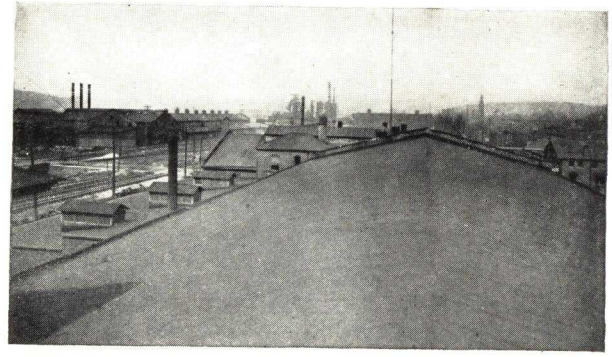
RUBEROID ROLL ROOFINGS

Ruberoid Roll Roofings are the result of many years of careful study and development. Their long life and economy have made *Genuine* Ruberoid Roll Roofings a standard of roofing quality all over the world.

The formula for Ruberoid Roll Roofing was pioneered in 1892. In the production process, strong felt fabric is filled with a powerful saturant and finally coated with heavy weather-resisting asphalt. There are many examples today, of Ruberoid Roll Roofing installations that were laid twenty and twenty-five years ago and are still giving dependable service.

Today, gigantic roofing machines in six great plants, turn out hundreds of rolls of *genuine* Ruberoid in a fraction of the time it took to make the first roll by a laborious hand process.

Ruberoid Roll Roofings are made in two styles: Smooth Surfaced and Mineralized. The Mineralized Roofing has an additional surfacing of colorful mineral granules on one side, which artistically blends with the scenic surroundings.



This Ruberoid Roof, Installed 41 Years Ago, Is Still in Service

RUBEROID ROLL ROOFINGS (Continued)

There is a Ruberoid Roofing to meet every building need and economic condition, and The Ruberoid Co. is glad at all times to recommend the type and grade of roll roofing best suited to individual requirements.

GENUINE RUBEROID SMOOTH ROLL ROOFING — No. 100

No effort has been spared to make this the finest smooth surface roll roofing possible. Installations made over 35 years ago are still in good condition.

Five Weights: Light, 35 lbs.; Medium, 45 lbs.; Heavy, 55 lbs.; Extra-Heavy, 65 lbs.; Super-Weight, 75 lbs. Each roll 36 in. wide, containing 108 sq. ft.

45, 55, 65 and 75 lb. weights have Underwriter's Label Class "C."

GENUINE RUBEROID MINERALIZED ROLL ROOFING — No. 110

(Heavy Weight.) Has 2-in. bare marginal edge and is coated on under side. Zinc-coated large headed nails and lap-cement included in each roll. Underwriter's Label, Class "C." Average approximate weight: 90 lbs. per 108 sq. ft. roll, 36 in. wide.

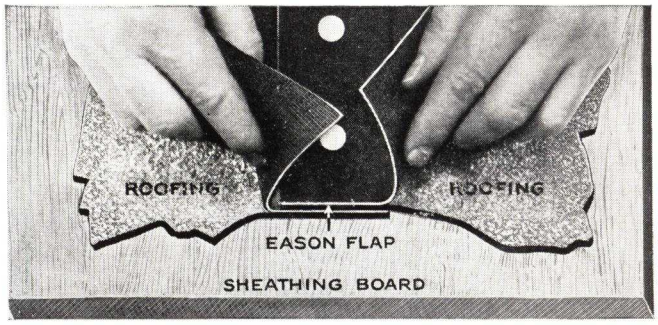
Available in many attractive colors and color blends.

RUBEROID MINERALIZED ROLL ROOFING — No. 112 (Extra Heavy Weight)

Same as No. 110, but with additional weight. Average approximate weight: 105 lbs. per 108 sq. ft. roll, 36 in. wide. Rolls shipped from Joliet, Ill., 32 in. wide. Underwriter's Label, Class "C." There are many attractive colors and blends to choose from.

There are numerous other Ruberoid Roll Roofings available with excellent serviceability at lower cost. Full particulars will be sent on request.

GENUINE RUBEROID ROLL ROOFING WITH EASON FLAPS



Eason Flaps permit the application of *Genuine* Ruberoid Roll Roofing with virtually a 7-layer seam. They are ideal for new construction or re-roofing work.

With Eason Flaps all nails are sealed with two layers of fabric and one of asphalt seam cement. Nails cannot rust or pop out because of heat. Virtually a 7-layer built-up seam with closed lap edge, there is no opportunity for wind or water to get under. This patented flap provides reinforced protection at the weakest part of a roll roofing roof—the seams. Successfully used on both steep pitches and almost true level decks, with both smooth and mineral surfaced roofing, Eason Flaps are supplied with *Genuine* Ruberoid Roll Roofing at only a small additional cost.

OTHER RUBEROID PRODUCTS

CEMENT WATERPROOFING COMPOUND

RUBEROID Cement Waterproofing Compound (patented), when mixed with Portland cement, makes leaky cellars or pits bone dry. Its use in stucco entirely eliminates "hair cracking." It differs from other waterproofing compounds in that it does not delay the set or reduce the strength of the mortar. It contains no calcium stearate or other soap compounds.

A ¾-in. mortar facing containing Cement Waterproofing on the inside of a structure will resist a 200-ft. head of water from without. This fact makes it especially adaptable for use in pump pits, cellars or other structures below ground. Cement waterproofing will resist action of brine, hot water, steam, oils, distillates and other chemicals.

Packed in barrels (450 lbs.), 100-lb. and 25-lb. cans.

BUILDING PAPERS

Ruberoid manufactures a complete line of building papers. Included are the well-known reinforced papers—"Safe-n-dry" and "7-Ply"—for use behind clapboards, stucco, shingles, brick veneer and under floors.

"Safe-n-dry," because of its two sheets of kraft paper, the strong woven jute fabric used and the extra reinforcing cords along each edge, has unusual strength. It is almost impossible to tear, and never becomes sticky or brittle. It is clean, odorless, waterproof and air-tight. Rolls 36 in. wide contain 250 or 500 sq. ft. weighing 15 and 30 lbs. respectively.

Where unusual insulating values are required, "7-Ply" should be used. Standard rolls contain 250 or 500 sq. ft., 36 in. wide weighing 17 and 34 lbs. respectively. Both "Safe-n-dry" and "7-Ply" available in widths up to 84 inches on special order.

There are also less expensive building papers, saturated, or saturated and coated, in 500-ft. rolls, 36 in. wide. These are particularly adaptable for use under slate, tile, or other types of roofing where a waterproof protective covering is required.

Close-up of an Eternit Gothic Asbestos-Cement Shingle Roof at Cincinnati, Ohio.
Note the random widths and staggered butts.

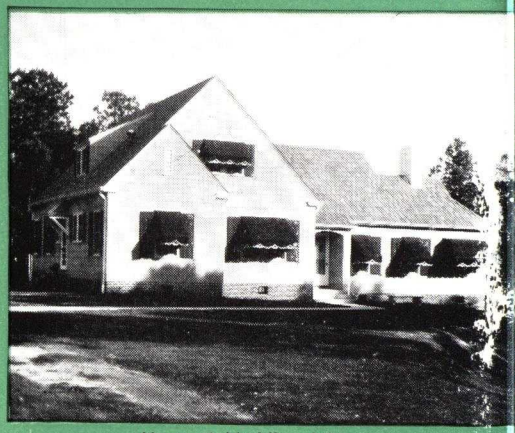
Apartment Residence in Jackson, Miss.
Roofed with Eternit Dutch-Lap Asbestos-Cement Shingles.
Eternit Colonial Asbestos-Cement Siding on sidewalls.

Residence at Afton, Minn.
Roofed with Eternit Timbertex Asbestos-Cement Shingles
Architects—Pesek & Shifflet, Minneapolis, Minn.

Home at Appleton, Wisc.
Roofed with 12" x 16" RU-BER-OID Massive Unit Asphalt Shingles.

Residence at Cincinnati, Ohio.
Roofed with Eternit Gothic Asbestos-Cement Shingles.

Colonial Cottage in Cleveland, Ohio.
Roofed with RU-BER-OID Evergreen Thick-Butt Asphalt Shingles.



Home at Meridian, Miss.
Sided with Eternit Colonial Timbertex Asbestos-Cement Siding.
Roofed with Eternit Dutch-Lap Asbestos-Cement Shingles.

Home at Bristol, Pa.
Sided with Eternit Asbestos-Cement Brick-type Siding.

SECTION 6

CONTINUED ⟶

UNITED STATES GYPSUM COMPANY

300 West Adams Street, CHICAGO, ILL.

For Sales Offices, see File Index for USG Catalog on Roof, Floor and Partition Products

USG ASBESTOS CEMENT ROOF SHINGLES

Description

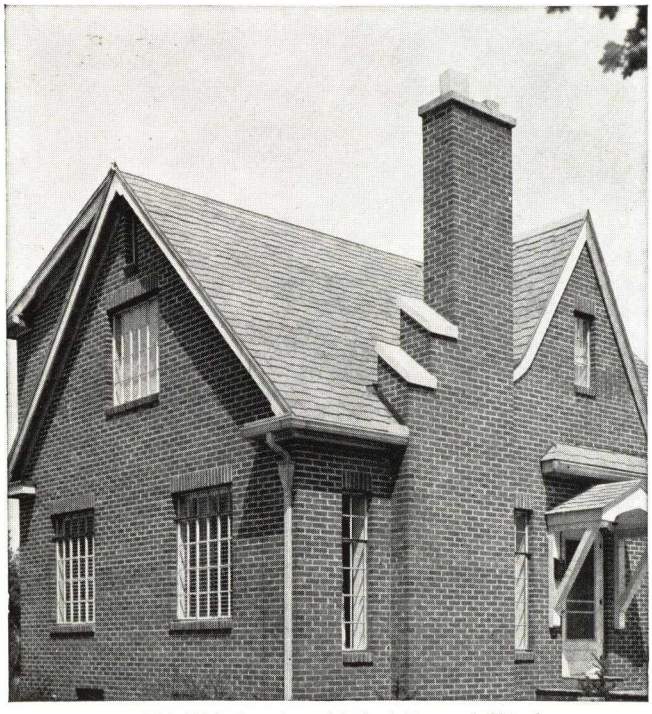
USG Asbestos Cement Roof Shingles provide a waterproof, fireproof, beautiful roof that is low in cost per year of service. Made of two non-inflammable materials—asbestos fibres and Portland cement. Carry highest ratings of the Underwriters' Laboratories. Do not rot, rust or decay. Wide variety of attractive colors and shapes enables architect to specify the roof that best conforms to the structures he designs. Deep, wood grain gives textured type shingles the beauty and charm of weathered wood.

No. 200 USG American Method Tapered Shingles

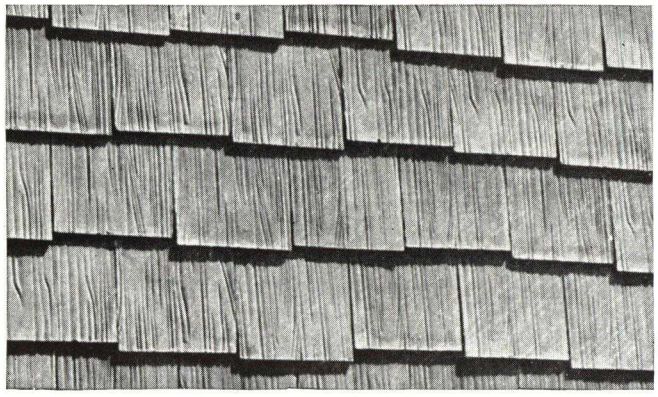
Class A Underwriters' Label. Hand Split Wood Shake Texture. Colors: Smoky Black, Pilgrim Gray, Buff, Tawny Brown, Bark Brown, Heather Brown, Tile Red, Copper Green, and Moss Green. Size: 9″ x 18″ with ¼″ to $\frac{5}{16}$″ butt. Exposure 8″. Headlap: 2″. Shingles per square: 200 (size 9″ x 18″). Shingles per bundle: 20—covers 10 sq. ft. Approximate weight per square: 490 lbs. Accessories Required: (Not included in price) American Method Starter Shingles No. 202, and 1¾ lbs. 1¼″ Galvanized Nails per square for 9″ wide shingles.

RANDOM WIDTHS

Random widths.....	5″	6″	7″	9″	12″	18″
Shingles per sq.....	360	300	257	200	150	100
1¼″ nails per sq....	3 lb.	2½ lb.	2¼ lb.	1¾ lb.	1¼ lb.	1 lb.

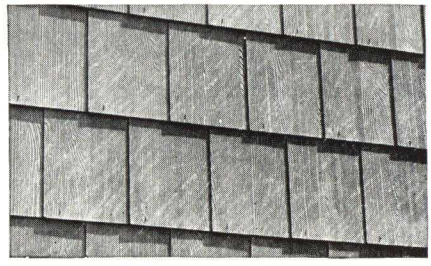


No. 200 USG American Method Tapered Shingles



Close-up of No. 200 American Method Shingles

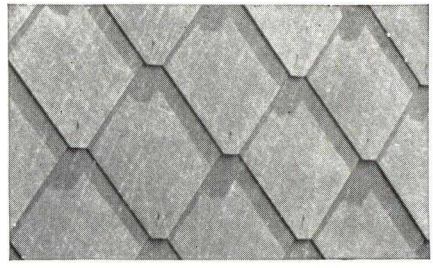
No. 300 USG Dutch Lap Shingles



Class B Underwriters' Label. ¼ sidelap (also applied ⅓ sidelap). Idealized Wood Grain Texture, uniform thickness. Colors: Gray, Pearl Gray, Green, Black, Red, Mottled Gray. Sizes: 16″ x 16″ x $\frac{5}{32}$″. Exposure: 12″ x 13″ (or 10⅔″ x 13″)*. Headlap: 3″. Sidelap: 4″ (or 5⅓″)*. Shingles per square: 92, covers 99⅔ sq. ft. (or 104)*. Shingles per bundle: 23, covers 25 sq. ft. (or 22½)*. Approximate weight per square: 252 lbs. (or 285* lbs.). Accessories: (Not included in price) No. 300-A Dutch Lap Starters, ¾ lb. (or 1 lb.)* 1¼″ Galvanized Nails and 92 (or 104) Copper Storm Anchors per square. No. 301 Dutch Lap Hip and Ridge Shingles.

**Note:* If shingles are applied with 5½″ sidelap (⅓ lap) the figures in parentheses () above apply.

No. 100 USG Hexagonal Method Shingles



Class B Underwriters' Label. Smooth surface, uniform thickness. Colors: Gray, Pearl Gray, Green, Red, Black, Mottled Gray. Size: 16″ x 16″ x $\frac{5}{32}$″. Weather Exposure: 13″ x 13″. Overlap: 3″. Shingles per square: 86. Shingles per bundle: 17. Approx. weight per square: 263 lbs. Accessories Required: (Not included in price) 1st Course Starters No. 101, 2nd Course Starters No. 102, 1 lb. 1¼″ Galvanized Nails and 86 Copper Storm Anchors per square. No. 103 USG Asbestos Cement Ridge Roll.

USG ASBESTOS CEMENT SIDING

Description

USG Asbestos Cement Sidings, like USG Roof Shingles, offer fire protection, permanence, beauty at an unusually low per year cost. They are made in a variety of colors and designs to provide the architect full freedom of selection and enable him to specify exterior walls that will remain attractive throughout the years.

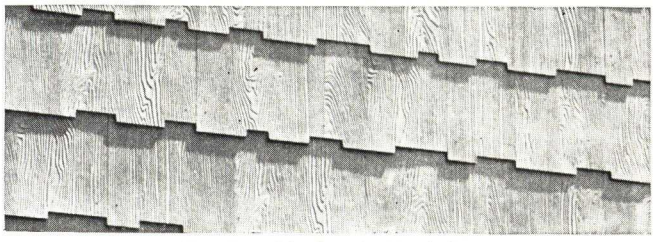
Outstanding features of USG Asbestos Cement Siding are the trueness and uniformity of colors, the variation in face textures, and the length of the shingle units—3 in. longer than any other asbestos cement shingle now available. This means 11% fewer joints, tighter, more wind resistant walls.

No. 600 USG Wavy Butt Siding

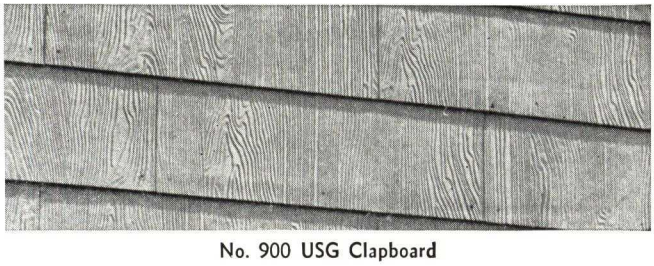
Idealized wood grain texture, uniform thickness. Colors: Gray, White, Green, Mottled Gray (smooth surface). Sizes: 12″ x 27″ x $\frac{5}{32}$″. Exposure: 10½″ x 27″. Overlap: 1½″ maximum—1⅛″ minimum. Shingles per square: 51. Shingles per bundle: 17 (covers 33⅓ sq. ft.). Approximate weight per square: 186 lbs. Accessories Required—Included in price: 51 pieces Asphalt Joint Strips 3″ x 12″ and 1¾″ Alloy Face Nails (Electro Tin Plated). Not included in price: ¾ lb. 1¼″ Galvanized Nails required for concealed (top) nailing. For illustration of this siding see cut at right, below.

No. 600-A USG Wavy Butt Siding

Idealized Wood Grain Texture, uniform thickness. Colors: Gray, Green, White. Size: 9½″ x 27″ x $\frac{5}{32}$″. Exposures: 8″ x 27″. Overlap: 1½″ maximum—1⅛″ minimum. Shingles per square: 66. Shingles per bundle: 22—covers 33⅓ sq. ft. Accessories Furnished—Included in price: 66 pieces Asphalt Joint Strips 3″ x 9½″ and 1¾″ Alloy Face Nails (Electro Tin Plated). Not included in price: 1 lb. 1¼″ Galvanized Nails for concealed (top) nailing.



No. 700 USG Thatch Butt Siding



No. 900 USG Clapboard

No. 900 USG Clapboard

Idealized Wood Grain Texture, uniform thickness. Colors: Gray, White, Mottled Gray (Smooth texture). Size: 9″ x 27″ x $\frac{5}{32}$″. Exposure: 8″. Overlap: 1″. Pieces per square: 66. Pieces per bundle: 22—covers 33⅓ sq. ft. Approximate weight per square: 180 lbs. Accessories Required—Included in price: 66 pieces Asphalt Joint Strips 3″ x 9″ and 1¾″ Alloy Face Nails (Electro Tin Plated). Not included in price: 1 lb. 1¼″ Galvanized Nails for concealed (top) nailing.

Applying No. 100 Hexagonal Shingles, Ft. Sheridan, Ill.

No. 700 USG Thatch Butt Siding

Idealized Wood Grain Texture, uniform thickness, deep wavy lines. Colors: Gray, White, Green. Size: 12″ x 27″ x $\frac{5}{32}$″. Exposure: 10″. Overlap: 2″ maximum—1¼″ minimum. Shingles per square: 54. Shingle per bundle: 18—covers 33⅓ sq. ft. Approximate weight per square: 191 lbs. Accessories Required—Included in price: 54 pieces Asphalt Joint Strips 3″ x 12″ and 1¾″ Alloy Face Nails (Electro Tin Plated). Not included in price: ¾ lb. 1¼″ Galvanized Nails required for concealed (top) nailing.

No. 600 USG Wavy Butt Siding

MEMORANDA

BARNETT CANVAS GOODS & BAG CO., INC.

Roofing and Porch Canvas, Awnings, Tarpaulins and Canopies

TELEPHONES
Market 2160-2161
Keystone Main 7564

128 Arch Street
PHILADELPHIA, PA.

REPRESENTATIVES: BALTIMORE, MD.; PITTSBURGH, PA.; CINCINNATI, OHIO; YORK, PA.; BOSTON, MASS.
ALSO IN OTHER PRINCIPAL CITIES

Barco-Dex Roofing and Porch Canvas

Barco-Dex is a canvas especially designed and woven for covering flat roofs, floors and decks in any type of building. *No chemicals are used* in the manufacture of Barco-Dex and it is unaffected by sun, wind, rain, snow and frost even after years of service.

Where Barco-Dex Should Be Used

From the viewpoint of the architect, contractor and owner Barco-Dex furnishes an ideal covering for porch roofs, piazza floors, sleeping balconies and similar locations where an attractive, economical and durable material is required. Barco-Dex is sound-proof, non-heat radiating and non-conductive to heat and cold. It is easily and quickly laid and its upkeep is practically nothing. It withstands footwear to a remarkable degree and for this reason provides an excellent material for covering areas subject to pedestrian traffic.

Barco-Dex has been much used for lining wood box gutters, as a covering for hips and valleys under other types of roof coverings, and for certain forms of construction it makes an excellent flashing.

Application of Barco-Dex

Before applying Barco-Dex the base surface should be cleaned thoroughly and dressed down to eliminate rough places and sharp edges. Over this surface the canvas may be laid direct without bedding or a bed may be prepared of white lead thinned with linseed oil to a paste consistency. This should be spread in a heavy coat and while the bedding material is still wet, the canvas should be drawn and stretched slightly to insure a good bond to the base surface.

When the canvas is laid parallel to the building, the outer or lower strip should be laid first and the laps of the following strips should be toward the first strip. Lap should be not less than 1½ ins. Against walls and other vertical surfaces the canvas should be turned up from 4 to 6 ins. and fastened securely. Cover with cap flashing where necessary.

When Barco-Dex is stretched, fasten the exposed edge with ¾-in. copper or galvanized tacks spaced 4 ins. apart. After tacking, spread the edge with a coat of bedding paint 1½ ins. wide and apply the next strip, lapping over 1½ ins. in the same way, and tack through the lapped edges with ¾-in. tacks spaced ¾ in. apart.

When entire surface has been covered and flashing completed, give the canvas a light coat of lead and oil paint. After this coat is thoroughly dry apply second and heavier coat.

SPECIFICATIONS AND PRICES (PER YARD) OF BARCO-DEX

Width, in.	White No. 300	Khaki No. 314	White No. 128	White No. 126	Khaki No. 1108
36	$0.80	$1.05	$1.10	$1.30	$1.50
54	.....	.....	1.60	1.85	2.25
60	.....	.....	1.90	2.10	2.50
72	.....	.....	2.25	2.40	2.80

All prices are based on a lineal yard. *The 36-in. width is the most popular.* All the above widths and weights carried in stock.
Prices subject to discount.

Bartex Cement

Bartex Cement, used for waterproofing and cementing the seams together during the process of tacking Barco-Dex, gives an especially water-tight installation. Cannot be used as a bedding.

SIZES AND PRICES OF BARTEX CEMENT

¼-pt. can	$0.50	1-qt. can	$2.50
½-pt. can	.80	½-gal. can	4.50
1-pt. can	1.40	1-gal. can	8.00

Prices subject to discount.

A Few Users of Barco-Dex

State Sanatorium at White Haven, Pa.—Stewardson & Page, Architect, Philadelphia; Chew-Bittel Co., Roofer, Germantown, Pa.

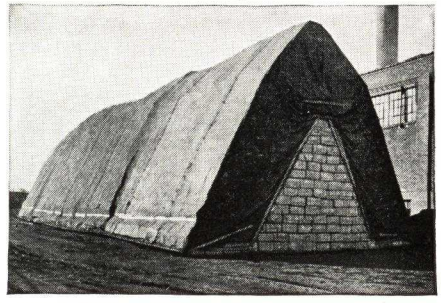
St. Vincent's Hospital, Philadelphia, Pa.—Philip Johnson, Architect.

Lancaster Municipal Airport, Lancaster, Pa.—J. B. Harman, Architect.

Awnings and Canopies

More and more architects are appreciating the fact that awnings and canopies should be selected and installed to harmonize with the building on which they will be used. The Barnett Canvas Goods & Bag Co., Inc., has unusual facilities for manufacturing any type of awning and canopy and we are pleased to offer the architect, contractor and owner, the results of our extensive experience in this work.

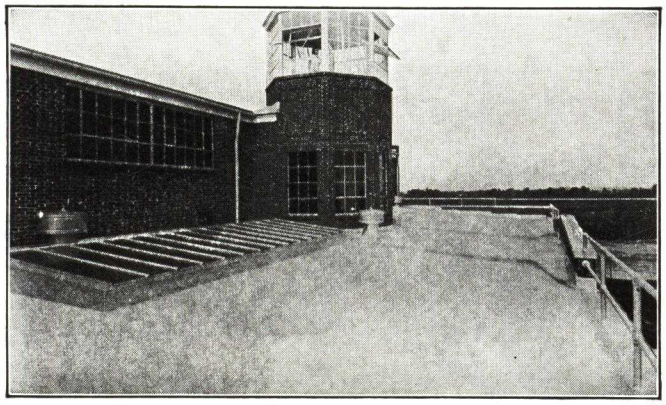
Barco Tarpaulins



This New Jersey box manufacturer selected Barco No. 30 for covering the piles of pulp in his yard—over 79,000 sq. ft. of Barco Guaranteed Protection

Barco tarpaulins and truck covers are strongly and carefully constructed to give the greatest wear. Built in 7 different grades and 12 stock sizes, here is a wide range of covers to meet every requirement. Light weights for enclosures, medium grades for perishables, heavy, closely woven cloth for truck covers, where guaranteed protection is essential.

Over one million square feet of covers ready for shipment.



Tower and Hangar, Lancaster Municipal Airport—Barco-Dex Was Specified for This Installation
J. B. Harman, Lancaster, Pa., Architect

WILLIAM L. BARRELL COMPANY, INC.

Cotton Duck—Converted Fabrics
40 Worth Street, NEW YORK, N. Y.

BRANCHES

ATLANTA, GA., Trust Co. of Ga. Building
BOSTON, MASS., 52 Chauncy Street
CHICAGO, ILL., 300 West Adams Street
KANSAS CITY, MO., 219 West 8th Street
LOS ANGELES, CALIF., 1206 Maple Avenue
SAN FRANCISCO, CALIF., 360 Pine Street

CON-SER-TEX—A CANVAS COVERING FOR ROOFS AND FLOORS

Characteristics of Con-Ser-Tex

CON-SER-TEX CANVAS ROOFING
TRADE-MARK

Con-Ser-Tex is a specially woven cotton fabric scientifically treated by a chemical process which makes it not only waterproof but preserves it against the ravages of dry rot, mildew, vermin and the elements—the arch enemies of ordinary cotton duck.

The development of the chemical process had its origin in an investigation of the properties of Egyptian mummy cloths which have been known through the ages as possessing extraordinary features of durability. Modern research disclosed the fact that the cotton fibres had been physically altered to prevent capillary attraction and revealed the basic chemical treatment which was used in the process. In the manufacture of Con-Ser-Tex these same properties have been secured along with others which make the material particularly adaptable for its special uses. The chemical processes provide a protective coating to each cotton fibre which prevents the oils in paint from being absorbed by the fibres. In ordinary fabrics, these oils form one of the most destructive elements because of their oxidizing action. No oils or paraffin enter into the manufacture of Con-Ser-Tex.

While paint is necessary to provide a wearing surface on canvas decks, it is the inherent checking tendency of oil paints which not only breaks the surface fibres but exposes the body of the fabric to rotting and mildew. In Con-Ser-Tex these difficulties are reduced to a negligible minimum.

Adaptability and Advantages of Con-Ser-Tex

Con-Ser-Tex has many miscellaneous industrial uses, but in building construction as a roof covering and a floor covering in exposed locations subject to footwear it offers many advantages not obtainable by any other type of covering. Even where footwear is not a consideration it offers many advantages as a roofing material.

Under foot and heavy rain impact it is obviously less noisy than any metal covering.

There is no other type of roofing at once so light and so durable under foot traffic.

It offers advantages in its low heat transmission.

Con-Ser-Tex is an ideal covering for floors and roofs of porches for residences, hospitals, sanitariums, clubs, etc.

It is a most serviceable covering for roofs of frame or fireproof construction used for roof gardens and for recreational purposes in general.

In the heavy grades it is recommended for roofs where water is collected or retained, such as for spray ponds used in connection with air conditioning on refrigerating plants.

Corrosion will destroy tin and galvanized roofing materials sooner than Con-Ser-Tex will lose its strength and weather-resisting properties.

Practical Utility and Economy

Con-Ser-Tex is so woven and treated that there is no tendency to curl or blister. It lies flat. This is unusual in a material of its type.

As a covering for warped roof surfaces and geometrical forms, such as conical, domical and barrel roof surfaces, Con-Ser-Tex offers evident advantages. Its wide use by railroads for passenger car roofing bears testimony to this effect.

The Tan surface of Con-Ser-Tex is to be laid to the weather and is primed for painting. This reduces the quantity of surface paint required and results in a smoother, more attractive appearance in the finished installation.

Preparation of Surfaces

Where the construction is of wood frame the surface may be of the common grades of pine, fir, spruce, etc., available in the locality and equal to No. 2 common flooring.

Where foot traffic is intended the surface and framing should be rigid. Material ⅞ in. thick and 3 ins. or not over 4 ins. wide will be found to give a satisfactory result and it must be tongued and grooved. It should be smooth, with joints planed if necessary. Any knots or pitch streaks must be shellacked. Shiplap should not be used.

Where there is likelihood of dampness from underneath, the wood should be painted on the underside before laying and the joints made up in white lead. White pine in narrow widths is particularly useful in such cases.

When used over masonry surfaces, portland cement topping should be laid and troweled to a smooth surface without projections which might perforate the Con-Ser-Tex, and dressed nailing strips dipped in creosote should be set as shown on accompanying detail.

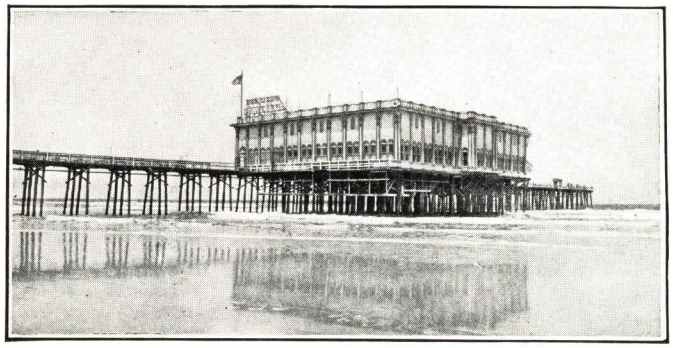
How to Apply Con-Ser-Tex

Dress the surface by eliminating rough places and sharp edges, then apply a heavy coating of Barrell Special Bedding Paint as a bedding (see Note). Over this bedding (while still wet) lay the Con-Ser-Tex, *dark side down*, slightly stretching it so as to insure a close adhesion to the surface, taking care to arrange laps so as to permit free drainage.

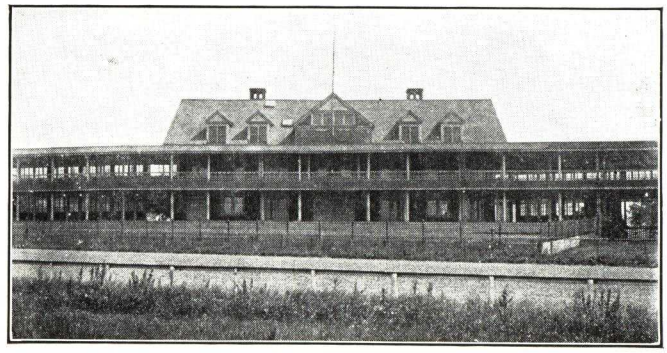
If Con-Ser-Tex is to be laid in parallel courses with the building, the strips start from the outer or lower edge of the surface to be covered. Con-Ser-Tex should be turned up or flashed 4 to 6 ins. at walls to insure a watertight result.

While Con-Ser-Tex is stretched, fasten with ⅞-in. copper or galvanized tacks 4 ins. apart on edge to be lapped. Coat the upper, exposed surface of the edge to be lapped 1½ ins. with the bedding paint, then apply the next strip, allowing a lap of not less than 1½ ins. Fasten with tacks ¾ in. apart.

After Con-Ser-Tex is laid and set, apply a coat of good quality lead and oil paint, and a heavy second coat of



The Pier Casino, Daytona Beach, Florida
Con-Ser-Tex covers the largest dancing pavilion south of Atlantic City



Club House, Empire City Race Track, Mt. Vernon, N. Y.
Con-Ser-Tex is giving service on the porch floor and roof

best grade Yacht Deck paint after the first is thoroughly dry.

Note: If desired, white lead thinned with linseed oil to a pasty consistency may be used as a bedding, but we recommend our Special Bedding Paint as it has greater adhesive quality.

Grades of Con-Ser-Tex

Grade E—The lightest grade of Con-Ser-Tex, suitable for roofing small areas where traffic is very limited.

Grade G—A medium weight, suitable for medium sized porch floors and roofs where traffic is not excessive.

Grade I—A heavy weight, suitable for roofing and flooring in residences and semipublic buildings where heavy traffic exists.

Grade K—The heaviest grade, designed for use in public buildings and all places where severe conditions exist.

Grade XXX—A *special* extra heavy grade to meet extreme conditions. Prepared only to order. Price upon application.

Economy in Cost and Maintenance

The first cost of Con-Ser-Tex is reasonable and its upkeep practically nil, requiring painting only as often as the rest of the building.

LIST PRICES* OF CON-SER-TEX PER LINEAR YARD

Width, in.	Grade E	Grade G	Grade I	Grade K
30	$1.10	$1.22	$1.35	$1.44
36	1.30	1.42	1.55	1.66

Note: The above widths carried in stock. Other widths and special heavier weights processed to order. *Discounts furnished on request.

Advisory Service

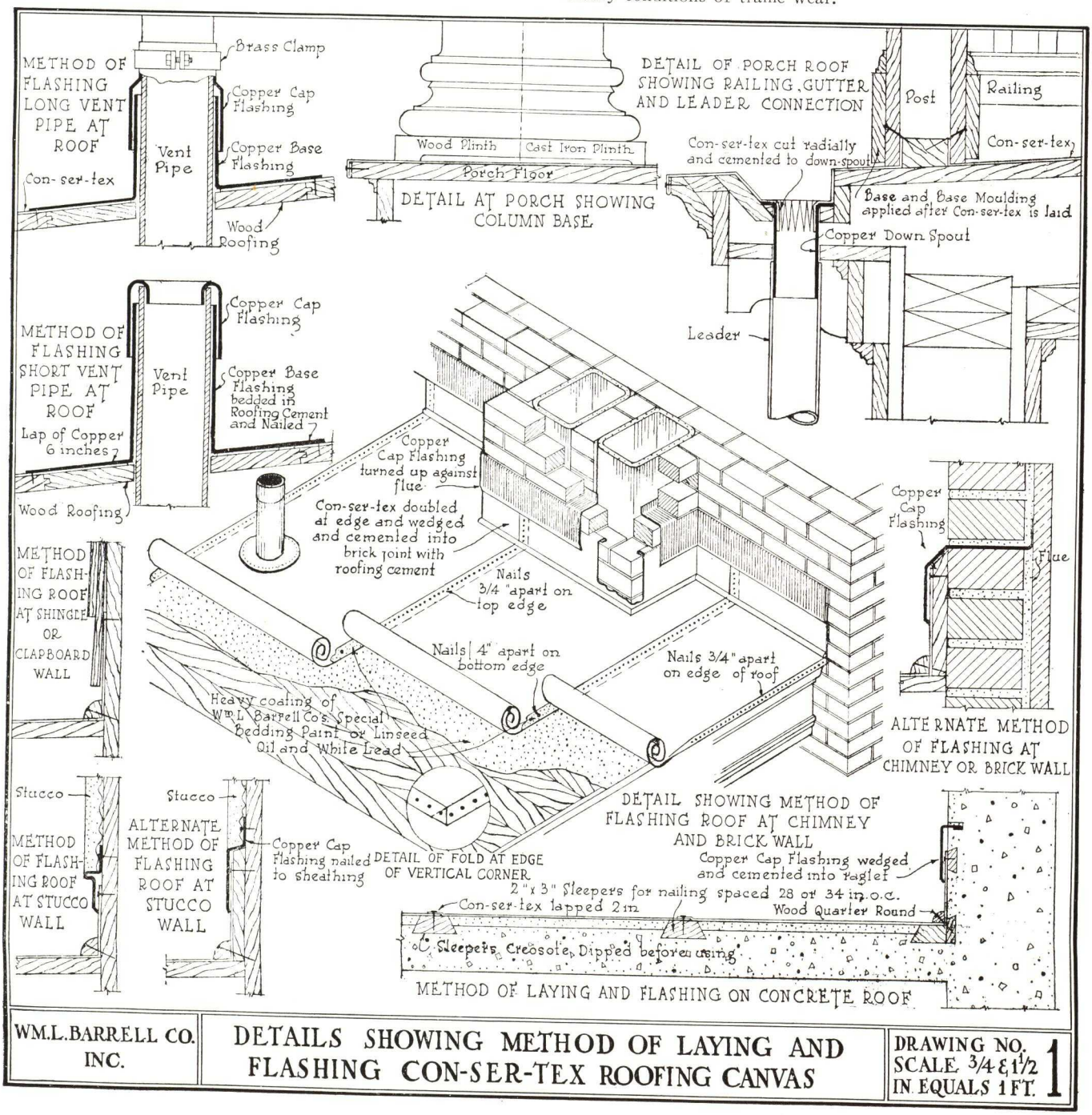
On receipt of dimensions of the surface to be covered, we will submit an estimate of cost, also a diagram showing the most economical method of laying Con-Ser-Tex, eliminating to the greatest possible extent all waste in cutting.

There is no charge for this service.

Guarantee of Material

Our company stands back of its products. We guarantee Con-Ser-Tex to be waterproof and to remain so for a period of ten years when laid and maintained in accordance with our instructions given on request with submission of drawings.

We do not, of course, guarantee Con-Ser-Tex against extraordinary conditions of traffic wear.



WM.L.BARRELL CO. INC.	DETAILS SHOWING METHOD OF LAYING AND FLASHING CON-SER-TEX ROOFING CANVAS	DRAWING NO. 1 SCALE 3/4 & 1 1/2 IN. EQUALS 1 FT.

BUCKINGHAM-VIRGINIA SLATE CORPORATION

1103 East Main Street,
RICHMOND, VA.
TELEPHONE: 32947
QUARRIES AND SHIPPING POINT: ARVONIA, VA.

BUCKINGHAM ROOFING SLATE

QUARRIED SINCE 1787

AWARDS OF MERIT

First Award .....London 1857
Gold Medal ..Philadelphia 1876
Gold Medal .....Chicago 1893
Gold Medal.....St. Louis 1904

GUARANTEED UNFADING

Characteristics of Buckingham Slate

This exclusive roofing slate, which defies time, has been quarried since the latter part of the eighteenth century, and covers many of the outstanding buildings in America. There is no substitute for Buckingham Slate where beauty, permanence, economy, and satisfaction are considered.

Texture and Color

Buckingham Slate is famous for its wide range in natural rock texture. The everchanging play of light and shadow over its rustic surfaces creates most interesting effects that never become tiresome. Its pleasing, deep gray color is greatly enriched by a soft, silvery lustre, which causes the color values to change from lightest to deepest gray tones as the light strikes the surfaces from different angles.

Since Buckingham-Virginia slate does not fade, its general characteristics do not vary. For this reason it is especially suitable for roofing large building projects, individual units for which are built at intervals over a long period of time. Architects may rest assured that the Buckingham Slate originally applied will retain its color permanently, so that a later application of similar material will always match.

Superior Quality

Buckingham Slate is a mica, not a clay slate.

Buckingham Slate has received highest award for quality in the United States and England. The outstanding quality characteristics of Buckingham Slate cannot be over-emphasized. It has the lowest water absorption of any slate in America, the greatest strength with and across the grain, the highest resistance to acids, and is absolutely guaranteed to be unfading. Fading, or bleaching, in slate is a positive indication of deterioration.

Textural Slate

Textural slate is of the same fine quality rock from the same beds as our slate of standard texture, but is selected especially for its beautiful and distinctive appearance. It is available in all standard sizes, and in thicknesses from $\frac{3}{16}$ to 1 in. Attractive results are obtained by using the graduated percentage method. This is done by varying the length of the slates on the roof, starting with long slates at the eaves and finishing with short slates at the ridge. Different thicknesses are used throughout the roof to obtain the desired results.

Submit a set of plans to us for a suggested layout.

Specifications

Slate shall be Genuine Unfading Blue Grey—Blue Black Slate as produced by the BUCKINGHAM-VIRGINIA SLATE CORPORATION, 1103 East Main Street, Richmond, Virginia, and shall be of the following sizes and thicknesses ..... All slate shall be hard, dense, sound rock, punched for two nails each. No cracked slate shall be used. No broken corners on covered ends which sacrifice nailing strength or the laying of a watertight roof will be allowed.

Service and Production

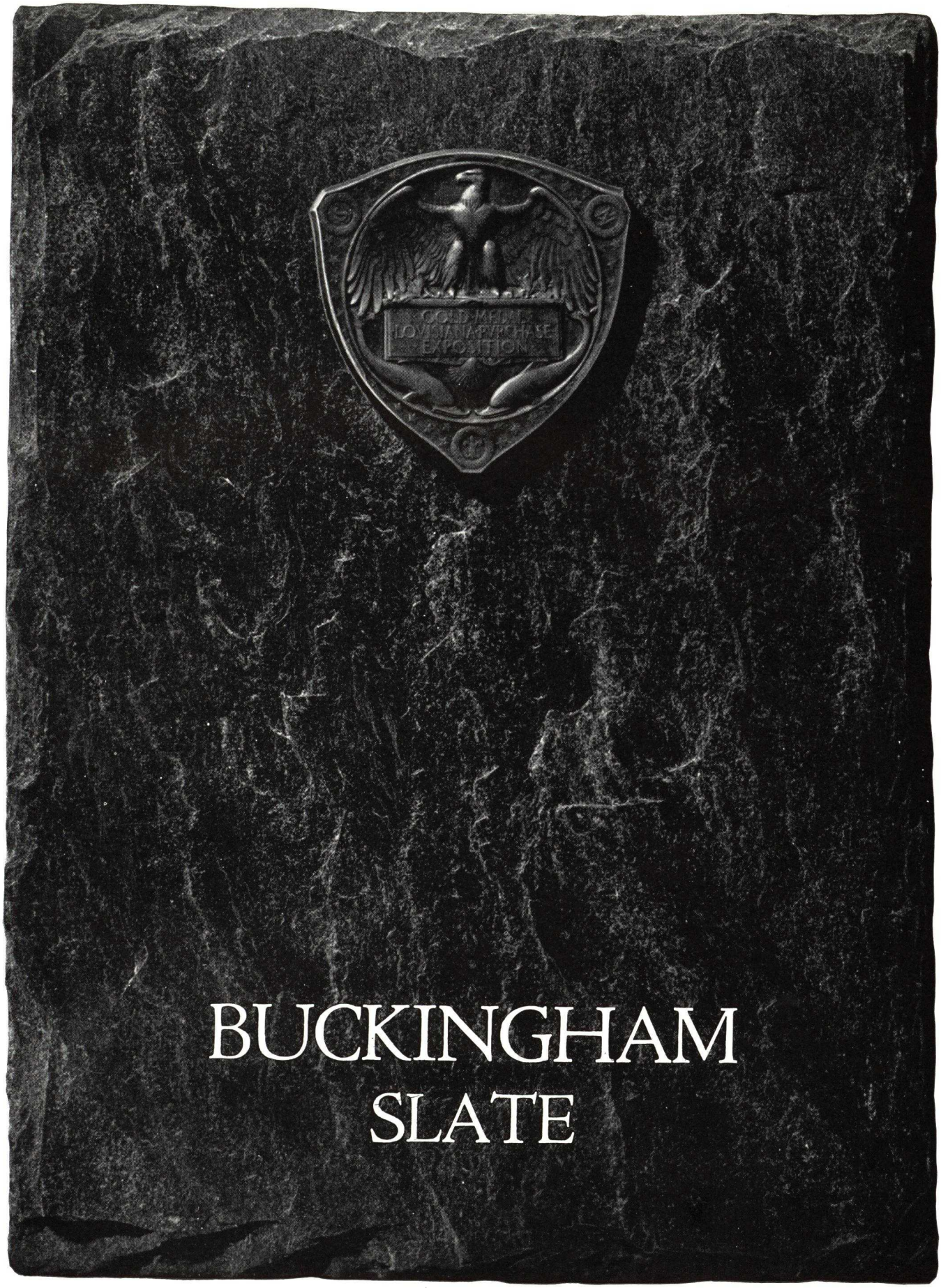
Complete architectural service, for the furnishing of layouts, estimates of quantities, etc., is available without cost.

To insure adherence to the specification request a certificate sent with each shipment.

The Buckingham quarries have ample production to take care of all demands. Also, we wish to impress upon architects desiring to specify Buckingham Slate that we carry a large stock in all sizes and thicknesses. This is definite assurance that prompt shipment can be made to conform to the architect's specifications.

Samples and literature will be furnished free upon request.

Furnished in All Standard Sizes and Thicknesses from 3/16 to 1 in.
Random Rectangular Flagging with Trimmed Edges for Floors and Terraces.
Flagging (Irregular shapes only) For Garden Walks, Stepping Stones, and Driveways.



BUCKINGHAM SLATE

NORTH BANGOR SLATE COMPANY

BANGOR, PENNSYLVANIA

TELEPHONE: Bangor 39 (After Office Hours: Bangor 288W)

REPRESENTATIVES

NEW YORK, N. Y., D. Bernard Myers, 536 Fort Washington Avenue—Telephone, WAdsworth 3-4030
PHILADELPHIA, PA., E. C. Strong, 305 Fairfield Avenue—Telephone, Boulevard 997
EASTON, PA., H. W. Fritts, 1412 Northampton Street—Telephone, Easton 2-2635

The Company

North Bangor Quarry was opened about 1863 by the late John Brown, was leased in 1882 by the North Bangor Slate Company and has been continuously operated by this company for the past half century.

This Label is Attached to About 5% of the Slates In Each Shipment

Today the North Bangor Slate Company, through its recent purchases of the Bangor Union Quarry and the Bangor Excelsior Quarry, has a normal output of from 75,000 to 100,000 squares of slate per year and is the largest producer of Genuine Bangor Slate.

Grades of Genuine Bangor Certificate Slate

Genuine Bangor Certificate Slate No. 1 Clear Smooth Texture—The finest grade of dark blue-gray slate. *Uniform throughout* as to color and texture, and free from knots and knurls that in any way interfere with the safe conveyance or the laying of the slate on the roof. Corners are full, cleavage is straight, maximum bend does not exceed ¼ in. in lengths up to 16 in. nor ⅜ in. in lengths from 16 in. up to 24 in. Thickness approximately 3/16 in.

Genuine Bangor Certificate Slate Clear Rough Texture—Similar in color to the No. 1 Clear Smooth Texture, this grade admits only such knots and knurls which do not interfere with the close laying of the slate. Corners are full and cleavage is similar to the No. 1 Clear Smooth Texture. Thickness varies from 3/16 to ¼ in.

Genuine Bangor Certificate Slate No. 1 Ribbon—Similar in all respects to the No. 1 Clear Smooth Texture, except that one or more ribbons of darker material may cross the slate in such a manner that *when laid with the regulation 3-in. lap, the ribbons shall not be exposed to the weather.*

Genuine Bangor Certificate Development Slate—Similar in all respects to the No. 1 Clear Smooth Texture, except ribbons may cross the slate in such a manner as to be exposed to the weather. To be used where cost is the deciding factor.

Relative Life of Slate

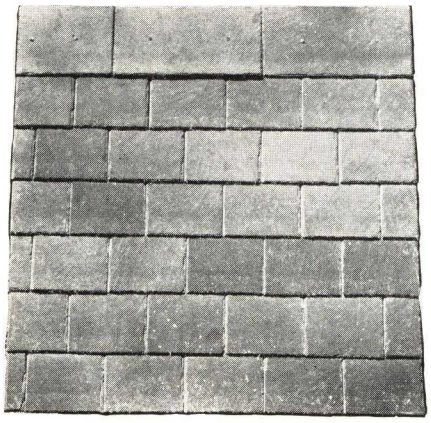
No. 1 Clear Smooth Texture has a useful life of seventy-five to one hundred years. Clear Rough Texture has a useful life of the same length. No. 1 Ribbon has a useful life of fifty years and Development Slate has a useful life of thirty-five years.

Stock Sizes Available at All Times

Due to the large production of the North Bangor Slate Company's Quarries, a complete stock of the sizes given in the table and in standard thickness of approximately 3/16 in. is available at all times. All shipment are made from quarries at Bangor, Pa. Heavier slate in ¼, ⅜, ½, ¾ and 1 in. are manufactured promptly to order.

STOCK SIZES AVAILABLE

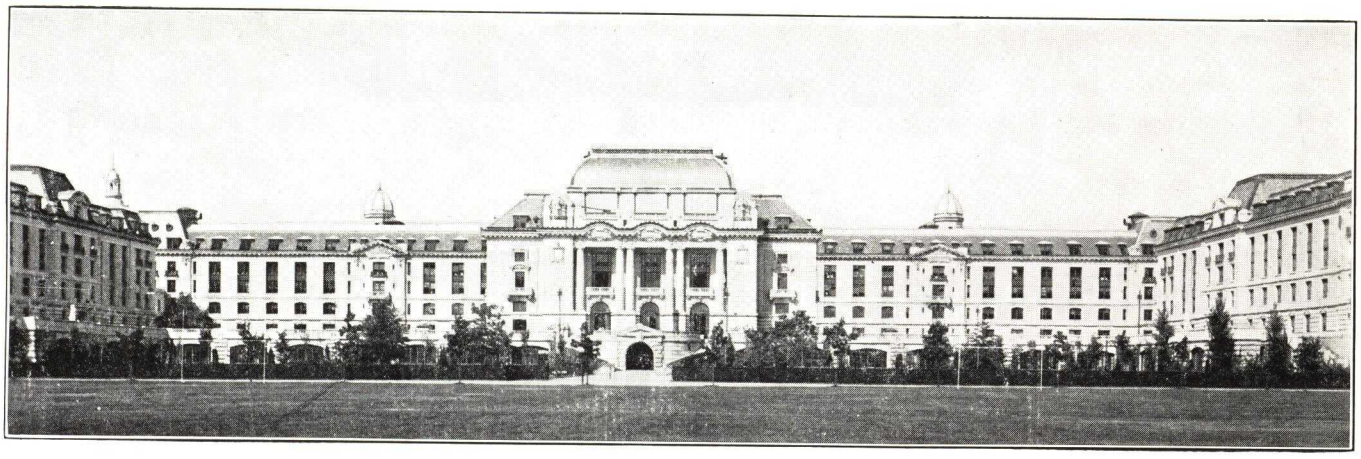
Type	Sizes are in inches—length by width in the order given						
No. 1 Clear....						14x12	
	24x14	22x12	20x12	18x12	16x12	14x10	12x10
	24x12	22x11	20x10	18x10	16x10	14x 8	12x 8
	.....	.....	.....	18x 9	16x 9	14x 7	12x 7
	.....	.....	.....	.....	16x 8	.....	12x 6
No. 1 Ribbon..						14x12	
and	24x12	22x12	20x12	18x12	16x12	14x10	12x 8
Development ..	.....	22x11	20x10	18x10	16x10	14x 8	.....
	.....	.....	.....	18x 9	16x 8	14x 7	.....



Standard Lay

Thatch Lay

Rough Texture Lay



Bancroft Hall, United States Naval Academy, Annapolis, Maryland
Slate furnished in 1915 by North Bangor Slate Company

Architects' Specifications

Slate shall be Genuine Bangor Certificate Slate (state grade desired), identified by the copyrighted label of the Bangor Slate Association on a percentage of the slates. A Certificate of the Bangor Slate Association, specifying the car number, date of shipment, number of squares, grade and size, shall be furnished by the roofing contractor to the architect.

Slate shall be of commercial standard quality and thickness (or such thickness as may be desired). Size of slate shall be ( ) or random widths of ( ) lengths. Lap shall be 3 in. of the third course over the first course, the fourth course over the second course, etc. Nails shall be copper 1½ in. long for standard slate.

Note—Due to the fact that Genuine Bangor Certificate Slate is a high quality slate, well known to the architectural profession, and the building trades of the country, it is widely specified, probably more so than any other blue gray slate. Producers of slates similar in color, but of inferior quality, frequently endeavor to market their slates as Bangor Slate, under various names hyphenated with the word "Bangor". Architects are cautioned in writing specifications to make their specifications specific, thereby enabling them to avoid distressing complications. Specifications for Genuine Bangor Certificate Slate should be written so far as the material is concerned, as shown above.

SIZES, WEIGHTS AND PRICES

Sizes, in.	Number of pieces per sq.	Shipping weights, lbs.	Exposed when laid. in.	List prices
24 x 14	98	700	10½	
24 x 12	115	700	10½	
22 x 14	108	710	9½	
22 x 12	127	710	9½	
22 x 11	138	710	9½	
20 x 14	121	725	8½	
20 x 12	142	725	8½	
20 x 11	154	725	8½	
20 x 10	170	725	8½	
18 x 12	160	735	7½	
18 x 11	175	735	7½	
18 x 10	192	735	7½	
18 x 9	214	735	7½	
16 x 12	185	750	6½	
16 x 10	222	750	6½	
16 x 9	247	750	6½	
16 x 8	277	750	6½	
14 x 12	218	780	5½	
14 x 10	262	780	5½	
14 x 9	290	780	5½	
14 x 8	328	780	5½	
14 x 7	374	780	5½	
12 x 12	267	800	4½	
12 x 10	320	800	4½	
12 x 8	400	800	4½	
12 x 7	457	800	4½	
12 x 6	534	800	4½	
10 x 8	514	825	3½	
10 x 7	587	825	3½	

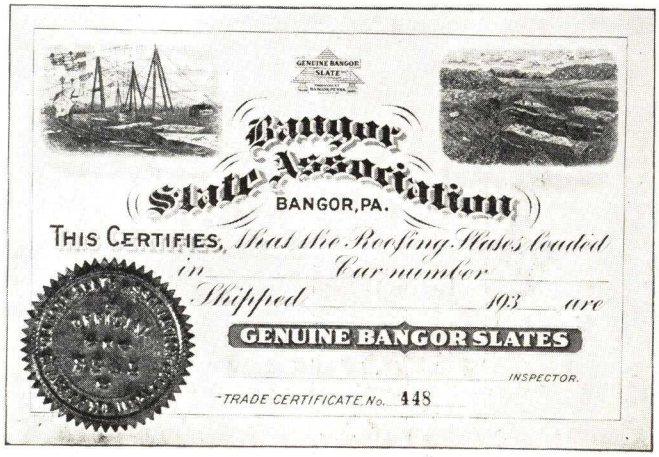
Prices range from $12.25 per square for the more popular sizes of No. 1 Clear grade, to $8.75 per square for the Development grade. Prices are subject to the usual trade discounts.

Other North Bangor Slate Products

The North Bangor Slate Company also produces Structural Slate for blackboards, stair treads and risers, toilet partitions, wainscots, thresholds, sills, sinks, tubs, etc., as well as Slate for floor and walks. Complete information gladly sent on request.

BANGOR SLATE ASSOCIATION

This is an organization formed more than forty years ago by the producers of Genuine Bangor Slate. Every quarry producing this slate is entitled to membership in this Association. The Association furnishes to its members its copyrighted label which is attached to about 5% of the slates in each shipment. It also furnishes to each shipper a certificate of the Association for transmission to the architect, owner or buyer. Facsimile of the label and certificate are shown on these pages. These are your protection against substitution. The slates should be inspected for the label and the certificate should be demanded by the architect from the roofing contractor.



ESTABLISHED 1901

O'BRIEN BROTHERS SLATE COMPANY, INC.

Quarriers and Manufacturers of Roofing Slate and Slate Flagging

MAIN OFFICE

GRANVILLE, N. Y.

QUARRIES—PAWLET, VERMONT

UNFADING GREEN—UNFADING MOTTLED GREEN AND PURPLE—GRAY—WEATHERING GREEN—VERMONT BLACK—RUSTICS

Unfading Green—Considered one of the best products manufactured in Vermont Roofing Slate, absolutely unfading and a certificate is furnished by the Unfading Slate Association to the effect that our slate is *unfading.*

Unfading Mottled Green and Purple—The green and purple color appears in each individual slate. A certificate is furnished by the Unfading Slate Association with every shipment which guarantees that slate is *unfading* and of the best possible slate rock obtainable.

Gray—This slate is furnished in two shades, a light and dark, and is of a somewhat rougher texture than our other slate.

Weathering Green—A commercial slate that gives the owner the best possible roof protection at the least possible price. This material fades out but this fading does not affect the watertightness of a roof of this color.

Vermont Black—A rough texture slate produced only in ¼ in. and thicker thicknesses. Some are a shiny black while others are sort of gray-black.

Rustics—The quarry people call them Freaks, they are a top rock of very poor qualities for durability. The bronze and yellow colors disappear after being exposed to the weather. This type of slate is recommended only in ⅜ in. and thicker thickness.

SPECIFICATIONS

(1) General and Guarantee—

(a) The General Conditions of the contract are hereby made a part of the contract and this contractor shall examine these General Conditions and thoroughly acquaint himself with all the requirements therein contained.

(b) This contractor shall furnish all materials and labor in accordance with the drawings and these specifications.

(c) This contractor shall inspect all surfaces prepared for slating by other trades, point out to the proper authority all defects, and shall not proceed with the laying of felt, flashings or slate until the necessary corrections have been made.

(d) Roofing shall be applied by workmen experienced in the applying of slate.

(e) The roofing contractor shall furnish his own scaffold or rigging, or arrange with the general contractor for the use of scaffolds furnished by others.

(f) A written guarantee shall be furnished that the materials used are in strict accordance with these specifications, and that any and all repairs required on the roof due to defective materials or workmanship furnished under this contract shall be made without cost to the owner for a period of one year.

(2) Roofing Felt—

(a) On all boarding to be covered with slate, furnish and lay asphalt saturated rag felt, not less in weight than that commercially known as "14-lb." felt. In this weight, per 100 sq. ft., a tolerance of 1 lb. plus or minus will be allowed.

(b) Felt shall be laid in horizontal layers with joints lapped toward eaves and at ends at least 2 in. and well secured along laps and at ends as necessary to properly hold the felt in place and proect the structure until covered by the slate. All felt shall be preserved unbroken, tight and whole.

(c) The felt shall lap over all hips and ridges.

(d) Felt shall be lapped 2 in. over the metal of any valleys or built-in gutters.

(3) Slate—

Slate shall be of commercial standard No. 1 quality and thickness, size 14 x random widths, Unfading Green Slate as mined and manufactured by O'Brien Brothers Slate Company, Inc., Granville, N. Y. A certificate of the Unfading Slate Association of Vermont shall be furnished by the contractor.

All slate shall be hard, dense, sound rock, machine punched for two nails each. All exposed corners shall be practically full. No broken corners on covered ends which sacrifice nailing strength or the laying of a watertight roof will be allowed. No broken or cracked slates shall be used.

(4) Hips—

(a) All hips shall be laid to form "saddle" hips without metal underneath.

(5) Ridges—

(a) All ridges shall be laid to form "saddle" ridges. The nails of the combing slate shall pass through the joints of the slates below.

(6) Valleys—

(a) All valleys shall be laid to form "open" valleys.

(7) Elastic Cement—

(a) Cement shall be an approved brand of waterproof elastic slaters' cement colored to match as nearly as possible the general color of the slate.

(8) Nails—

(a) All slate shall be fastened with two large-head slaters' solid copper nails. Use 3d (1¼-in. nails for slates 18 in. or less in length, 4d (½-in.) for 20-in. or longer, and 6d (2-in.) for slates on hips and ridges.

(9) Slating—The entire surface of all main and porch roofs, the roofs and sides of any dormer windows, if shown, and all other surfaces so indicated on the drawings, shall be covered with slate in a proper and watertight manner.

(b) The slate shall protect 2 in. at the eaves and 1 in. at all gable ends, and shall be laid in horizontal courses with the standard 3-in. headlap, and each course shall break joints with the preceding one. Slates at the eaves or cornice line shall be doubled and canted ¼ in. by a wooden cant strip.

(c) Slates overlapping sheet metal work shall have the nails so placed as to avoid puncturing the sheet metal. Exposed nails shall be permissible only in top courses where unavoidable.

(d) Neatly fit slate around any pipes, ventilators, etc.

(e) Nails shall not be driven in so far as to produce a strain on the slate.

(f) Cover all exposed nailheads with elastic cement. Hip slates and ridge slates shall be laid in elastic cement spread thickly over unexposed surface of undercourses of slate, nailed securely in place and pointed with elastic cement.

(g) Build in and place all flashing pieces furnished by the sheet metal contractor and co-operate with him in doing the work of flashing.

(h) On completion all slate must be sound, whole and clean, and the roof shall be left in every respect tight and a neat example of workmanship.

ESTABLISHED 1917

SHELDON SLATE PRODUCTS CO., INC.

Manufacturers of Roofing Slate and Slate Products

43 Main Street, GRANVILLE, N. Y.

BRANCH OFFICES

CHICAGO, ILL., 1645 So. Crawford Avenue
CLEVELAND, OHIO, 917 Fidelity Building
DALLAS, TEX., 3905 Normandy Street
DETROIT, MICH., 180 E. Larned Street
MEMPHIS, TENN., 440 Decatur Street
NEW YORK, N. Y., 101 Park Avenue
PHILADELPHIA, PA., Architects Building
PORTLAND, ORE., 2603 S. E. Grand Avenue
SEATTLE, WASH., 1107 W. Idaho Street

Products

Manufacturers of COMMERCIAL and ARCHITECTURAL ROOFING SLATE.

Also Structural Slate, Flagging, Crushed Slate, etc.

Personal executive attention is given every order. Truck delivery will be made, when required, to jobs within a radius of 300 miles of Granville.

Approval

Certified and approved manufacturers of slate products by National Association of Investigating Committees of Architects and Engineers; a general inspection of properties and facilities; acquaintance with personnel and favorable reports of architects and users of our products. (Official bulletin on request.)

SHELDON ROOFING SLATES ARRANGED AS TO PRICE CLASSIFICATION

GROUP A—Lowest Price Slates

Standard commercial thickness averaging $\frac{3}{16}$ in. Any one or combination of colors permitting a suitable selection for any type of structure at a price but little, if any, more than the best grades of wooden shingles and less than the better types of artificial roofing materials.

Available Colors—Semi Weathering Green and Gray; Unfading Green and Gray; Unfading Mottled Green and Purple; Unfading Mottled Gray.

GROUP B—Medium Price Slates

Averaging ¼ in. in thickness.

Available Colors—*Same as Group A above, with* the addition of Vermont Grays and Gray Blacks; Mottled Gray Black; and also the following:

Sheldon's Special Olde English Rough Texture—Intermingled thicknesses $\frac{3}{16}$ in. to $\frac{3}{8}$ in., in any individual or grouping of colors designated in Group A or B. The use of these rough texture slates in accordance with our layout guarantees a highly satisfactory architectural roof at a minimum investment.

GROUP C—Highest Quality Slates, but Moderate in Price

Prices somewhat higher than Group A or B, but nevertheless decidedly moderate, based on the intrinsic value of the material.

Available Colors—Includes any individual or grouping of colors scheduled in Group A or B, with the addition of the following:

Antiques—In separate or mixed thicknesses ranging from $\frac{3}{8}$ in. to 1 in. or more.

Unfading Red—Slates $\frac{3}{16}$ in. or thicker.

Sheldon's Olde English Combination No. 12—This has proved one of the highest achievements in the fabrication of architectural roof slate. A beautiful blending of soft shades of greens, dark grays and buffs in just the right proportion to develop a roof of unusual character. In addition to the appellation simply specify maximum and minimum thicknesses and exposures as manufactured by SHELDON SLATE PRODUCTS CO., INC., Granville, N. Y., in accordance with layout as approved by the architect.

Data Common to All Sheldon Roofing Slates

Laboratory Tests—Sheldon's slates will fully measure up to the standards of excellence established by any tests thus far devised for determining the inherent value of the material.

Architectural Service—*Sketches, layouts, samples* and general or technical information bearing on any phase of a slate installation promptly tendered. Roof applications or setting of slate for structural or underfoot purposes, personally supervised when required.

Manufacturer's Certificate—Architects wishing to insure the complete fulfillment of their specifications may confidently incorporate in same the name of SHELDON SLATE PRODUCTS CO., INC., and require contractor to furnish certificate that the slate furnished is in accordance with the specifications.

Metal Work, Flashing Details and Specification Forms—Standard practice covering all of these roof details, owing to limited space, cannot be given here, but will be furnished any architect on request.

Samples—Sent to any architect on request.

STANDARD LENGTHS, WIDTHS AND EXPOSURES BASED ON 3-IN. HEAD LAP

Length, in. ...	10	12	14	16
Widths, in....	6, 7, 8, 9, 10	6, 7, 8, 9, 10, 12	7, 8, 9, 10, 12	8, 9, 10, 12
Exposure, in. .	3½	4½	5½	6½
Length, in. ...	18	20	22	24
Widths, in....	9, 10, 11, 12	10, 11, 12, 14	11, 12, 14	12, 14
Exposure, in. .	7½	8½	9½	10½

Other lengths or widths made to order when required. Slates narrower than standard widths for respective lengths not recommended.

MEMORANDA

THE EDWARDS MANUFACTURING CO.

Manufacturers of Metal Tile and Metal Shingles

403-413 Culvert Street
CINCINNATI, OHIO

NEW YORK, N. Y., Room 1101, 92 Liberty Street (Metropolitan Area Only)

Authentic Roofing Type

This Metal Tile is an authentic roofing type. The Romans gave us the first metal tiles —casting them from bronze. Next, these metal tiles were curved, the first course being laid with the roll down and covering the joints with tiles laid roll up, as on the circular temple of Vesta made from Syracusan Bronze. One of the Popes took tiles of this kind from several of the temples and covered the Basilica of St. Peter. Since the tenth century, lead and copper tiles of similar construction were used, particularly on the domes of Moscow and churches in Belgium and Germany. Edwards Spanish Metal Tile capitalized modern metal stamping equipment to provide a roof retaining all the beauty and massiveness of the old Moorish clay tile and at the same time overcoming some problems which it presents.

Fig. 367
Field Tile

Materials

Fabricated from Copper, Copper-bearing Galvanized Steel, Galvanized Tight-cote Steel, Tin (terne) Plate and Pure Sheet Zinc, all the above in any weight or gauge desired. Since metal is universally used to protect the structure at the weakest points of the roof—valleys, ridges, flashings, etc.—it is consistent to utilize it for the entire roof providing it is available in the proper form or design which will beautify as well as protect.

Advantages

(1) The only tile roof which is watertight in itself. Patented construction of interlocking joint provides perfect protection against elements, extreme ease of application, allowance for expansion and contraction.

(2) Edwards Metal Spanish Tile do not freeze, crack, or fall off due to climate changes.

(3) These tile do not absorb moisture which normally increases the weight of tile roofs of absorbent materials about 25%.

(4) Edwards Metal Tile is light in itself, about one-ninth the weight of clay tile, permitting much lighter framing and decreasing costs of laying.

(5) Makes the coolest roof by far as the metal radiates rapidly through the constant movement of air in the rolls. This movement is accentuated as the heat increases, thereby cooling the roof and the building.

Fixtures

Illustrations below show only a few of the many fixtures made to take care of different and special conditions. (See Catalog 72 for complete line of fixtures.) Illustrations show bungalow fixtures. Regular and Chinese fixtures also available. Illustration of roof section is scarcely large enough to show the variety of fixtures which embellish and beautify this roof treatment.

Engineering Service

Either send us the blueprints or a sketch showing the pitch, shape and dimensions of the roof, and our Engineering Department will furnish a list of the tile and fixtures required, together with quotation including freight to the railroad point nearest to site of building. Full directions will be furnished for application of tile and fixtures.

Specification

All pitched roof surfaces shall be covered with Edwards Metal Spanish Tile, manufactured by THE EDWARDS MANUFACTURING Co., Cincinnati, Ohio, to be made from.....

(Insert here: Tin Painted, Tight-cote Galvanized, No. 9 or No. 11 gauge Zinc, 9, 12 or 14-oz. Copper. If Painted, specify whether red or green.) Roof surfaces to be covered with felt or building paper. Tile to be applied straight and true so all horizontal lines are parallel with the eaves and all vertical lines are at right angles to the eaves. Fixtures shall be.....

(Insert here: Regular, Bungalow, or Chinese.)

Fig. 460
Side Wall Flashing

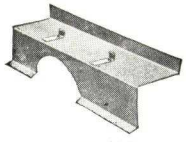


Fig. 425
Hip Flashing —Left

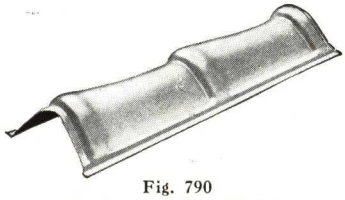


Fig. 790
Ridge and Hip Finish

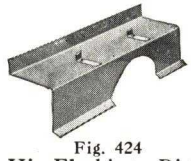


Fig. 424
Hip Flashing—Right

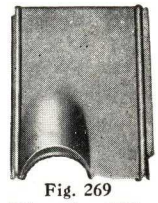


Fig. 269
Diverting Tile

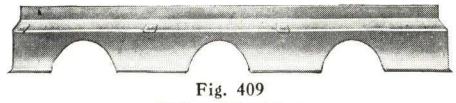
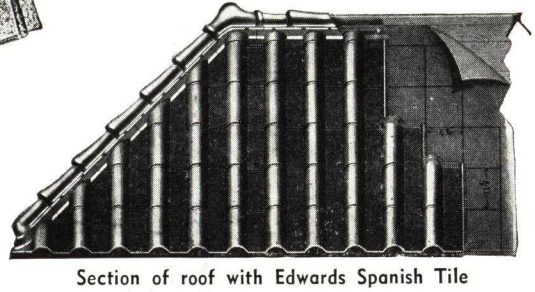


Fig. 409
Ridge Flashing

Fig. 461
Gable Flashing

Fig. 381
Valley



Section of roof with Edwards Spanish Tile

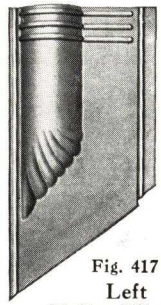


Fig. 417
Left Valley Tile

Fig. 416
Right Valley Tile

Fig. 369
Eave Tile

Write for Catalog 72 for fixtures for all points on roof and complete specifications.

LUDOWICI-CELADON COMPANY

Makers of "Ludowici" Roofing Tiles and "Ludowici" Wool Insulation

NEW YORK, N. Y.
CLEVELAND, OHIO

104 South Michigan Avenue
CHICAGO, ILL.

WASHINGTON, D. C.
OKLAHOMA CITY, OKLA.

AUTHENTIC IN EVERY DETAIL, "LUDOWICI" TILES FAITHFULLY REPRODUCE THE EFFECT OF OLD WORLD ROOFS

Products

Ludowici Roofing Tiles.
Ludowici Chimney Pots.
Ludowici Garden Walk Edging.
Ludowici Tile Slabs.
Ludowici Tile Flagging.
Also Ludowici Wool Insulation.

Manufacture

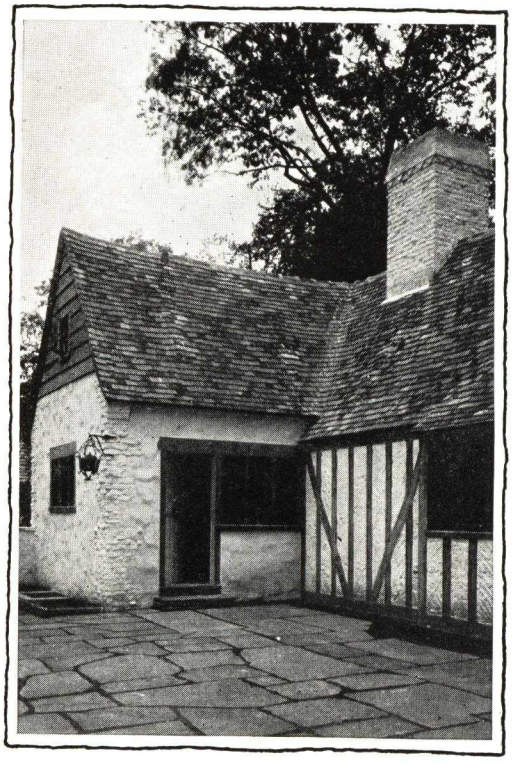
From the Ludowici clay pits of Ohio and Kansas come the finest clays obtainable. These clays, under our special manufacturing methods, produce hard-burned roofing tiles of non-reflective texture, whose soft, rich colors are obtained in the burning process—hence are permanent.

Texture

Ludowici Shingle Tile reproduce with historic accuracy the crude, rugged charm of the French farmhouse and the English countryside roofs, and give the required feeling of weight your design demands. The Colonial shingles reproduce in every detail the texture and color of old, hand-split wood shingles.

Closed Shingle, English Shingle, Mission, Spanish, Roman, Italian, and Greek tiles are also produced in various textures, including weathered surface effects.

Variations in great number, both as to color and texture can be had to meet the individual requirements of architectural design and taste.



Colors

Ludowici Shingle tiles are produced in a wide variety of colors, ranging from light tans and buffs through varying reds, browns and purples, to greys, brownish blacks and dark weathered greens.

Ludowici Spanish, Mission, French, English Shingle, Closed Shingle, Roman, Italian, and Greek tiles are offered in natural reds and fireflashed shades, or glazes of most any color.

Permanence and Durability

A roof of Ludowici tiles will last as long as the building it covers. Once laid, it provides a permanently beautiful, weathertight and fireproof roof, with distinct insulating qualities; assures lifelong protection without the expense of painting or repairs.

Reasonable in Cost

A Ludowici tile roof is moderate in price, and can be installed without any special framing for the substructure.

Service to Architects

We invite you to write or call your nearest Ludowici representative for samples of tile, complete specifications, and for aid on any roofing problem you may have. Estimates promptly furnished from architects' complete plans and specifications.

Provincial Shingle

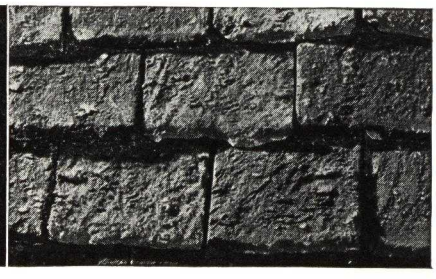
Size 7½" x 15" x ½"
Exposure 7½" x 6½"
295 pieces per sq.
Average weight per square, 1300 lbs.

Brittany Shingle

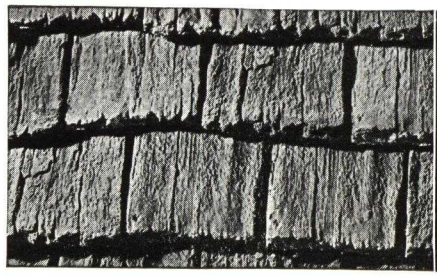
Size 7" x 12" x ⅜"
Exposure 7" x 5"
412 pieces per sq.
Average weight per square, 1650 lbs.

Antique Shingle

Size 7" x 12" x 9/16"
Exposure 7" x 5"
412 pieces per sq.
Average weight per square, 1525 lbs.



Colonial Shingle



Size 7" x 15" x ⅜"
Exposure 7" x 6½"
317 pieces per sq.
Average weight per square, 1600 lbs.

Norman Shingle

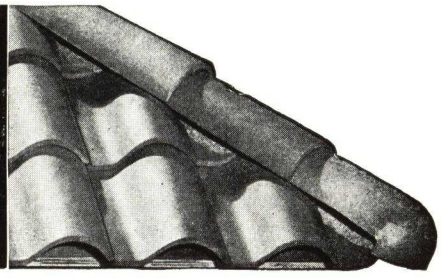
Size 7" x 12" x 9/16"
Exposure 7" x 5"
410 pieces per sq.
Average weight per square, 1360 lbs.

Yale Memorial Tile

Standard Sizes: Lengths 12", 14", 16" Widths 6", 7", 8". Thicknesses 5/8", 3/4", 1". Exposure and weight varies according to the size of tile used.

Spanish

Size 13 1/4" x 9 3/4"
Exposure 10 1/4" x 8 1/4"
171 pieces per sq.
Average weight per square, 850 lbs.



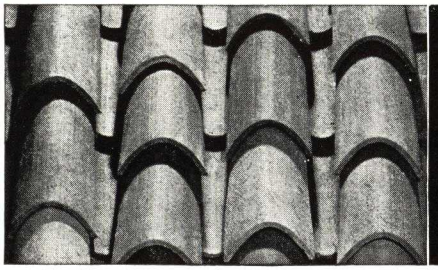
Straight Barrel Mission

Lengths, 18", 14 1/4" Exposures 15" x 11 1/2" and 11 1/4" x 11 1/2". 18" length 166 pieces per sq. Wt. 1200 lbs. 14 1/4" length 224 pieces per sq. Weight, 1225 lbs.

Cubana Tapered Mission

Size 18" x 11 1/4"
Exposure 15" x 11 1/4"
170 pieces per sq.
Average weight per square, 1300 lbs.
18" Straight Barrel Mission Pans.

18-in. Tapered Mission

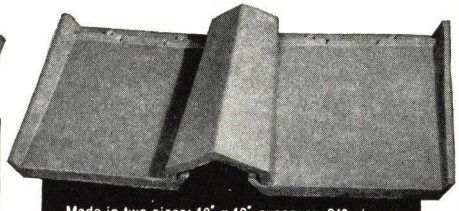


Size 18" x 10"
Exposure 15" x 10"
192 pieces per sq.
Average weight per square, 1300 lbs.
18" Straight Barrel Mission Pans.

Roman

Made in two sizes: 10" x 12" exposure, 240 pieces per sq.; 15" x 19" exposure, 102 pieces per sq. Wt., small size, 1150 lbs.; large size, 1400 lbs.

Greek



Made in two sizes: 10" x 12" exposure, 240 pieces per sq.; 15" x 19" exposure, 102 pieces per sq. Wt., small size, 1285 lbs.; large size, 1450 lbs.

Italian

Size of tile width 11 1/4" x length 12 1/4". Exposure 9 1/4" x 11 1/4", 276 pieces per square. Average weight per square is 1350 pounds.

LUDOWICI CHIMNEY POTS FOR USE WITH WEATHERED-EFFECT TILES

Chimney pots are made to fit standard flue linings. They are available in various textures and colors, with glazed or unglazed finish.

C.P. 200

C.P. 300, 310, 320

STANDARD STOCK SIZES

NUMBER	FLUE	BASE	HEIGHT
C.P. 200	7½"x7½"	13"x13"	15"
C.P. 300	8" Diam.	14"	18"
C.P. 310	12" Diam.	18"	21"
C.P. 320	15" Diam.	21"	25"
C.P. 400	8" Diam.	14½"	25"
C.P. 410	12" Diam.	18½"	29"
C.P. 420	15" Diam.	21"	32"
C.P. 500	8" Diam.	14"	15"
C.P. 510	12" Diam.	18"	18"
C.P. 520	15" Diam.	21"	22"
C.P. 600	10" Diam.	13"	15"
C.P. 610	12" Diam.	15"	18"
C.P. 620	15" Diam.	18"	20"
C.P. 630	18" Diam.	21½"	23"
C.P. 640	23" Diam.	26"	30"
*C.P. 650	8"x12"	11"x15"	20"
*C.P. 660	12"x17"	15"x20"	30"

*Elliptical.

C.P. 400, 410, 420

C.P. 500, 510, 520

C.P. 600, 610, 620, 630, 640, 650, 660

B. MIFFLIN HOOD COMPANY

Manufacturers of Roof and Floor Tiles, Face and Chemical Brick

ATLANTA, GA.
TELEPHONE, Hemlock 2252

CHARLOTTE, N. C.
TELEPHONE 3-1559

PLANTS: DAISY, TENN. and NORWOOD, N. C.

BRANCH SALES OFFICES

ATLANTA, GA., 686 Greenwood Avenue, N. E.
BOSTON, MASS., 80 Holton Street, Brighton, Mass.
CHATTANOOGA, TENN., P. O. Daisy, Tenn.
CHICAGO, ILL., 5751 No. Campbell Avenue
MIAMI, FLA., 1150 So. Miami Avenue
NEW YORK, N. Y., 103 Park Avenue
NORWOOD, N. C.
PHILADELPHIA, PA., Hood Tile Co., DeLong Building
TAMPA, FLA., 3315 McKay Avenue
WASHINGTON, D. C., Jas. P. Wheeler Co., 304 Raymond Street, Chevy Chase, Md.

Represented by Leading Roofers, Tile and Brick Dealers in Principal Cities

Products

An authentic ROOFING TILE for any type of architecture. Flat Shingle Tile, True Mission Tile, Tapered Mission Tile and Interlocking Shingle Tile.

Also manufacturers of brick of standard colors, shapes and textures. Fireplaces, Steps, Briquettes, Landscape Tile, Garden and Terrace Tile, Heavy Traffic Tile, Non-Slip Ramps, Brick and Stucco Inserts, Chemical Stoneware, Cylindrical Spiral Rings.

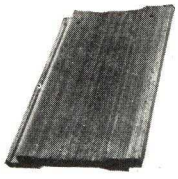
For our Floor Tile Page, see File Index.

Fighting Cocks Tavern

Yorkshire

Normandy

Devonshire



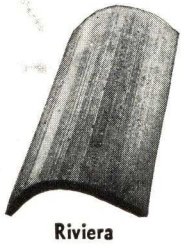
Dresden

Sussex

Barcelona

Toledo

Lombardy



Riviera

Habana

Shingle Tiles

"Fighting Cocks Tavern" — Handmoulded in true reproduction of old European handmade tiles. Antique colors including soot black, moss greens, browns and soft shades of red. Soft texture, with irregular butts.

"Yorkshire" — Sanded texture, in extreme wide range of antique colors. An excellent tile for color graduation.

"Normandy"—Made from soft alluvial clays, especially adaptable to the warm climates. Smooth but non-light reflecting texture, in cool buff and tan colors.

"Devonshire" (rough scored texture) or "Sussex" (smooth)—Hardburned shale tile, made in red, fireflashed and buff shades. "Devonshire" is also produced in Moss Mottle green shades, and "Sussex" can be furnished in a range of slate colors.

"Dresden" — A side-locking shingle, with scored texture. Red and fireflashed colors. Also made in Moss Mottle green shades.

"Sussex"—A thin but strong hard shale tile produced in dark sprayed slate colors, as well as the regular red and fireflashed shades. Light weight and economical.

Curved Tiles

"Barcelona"—A true handmade tapered Mission tile, made in moulds from alluvial clays and shale in a wide range of clay colors. Has a soft sanded and pitted texture.

"Toledo" — A handmade 15-in. Tapered Mission, made of alluvial clays, with a hand-raked texture and wide range of clay and engobe colors.

"Lombardy"—Machinemade Tapered Mission, with smooth die surface and non-reflecting clay colors.

"Riviera"—Straight barrel Mission, made from shale, in either Rough scored, Smooth or lightly scored Needlepoint texture. Produced in wide range of Red, Fireflashed and Buff shades.

"Habana" — Straight barrel Mission, made from alluvial clays. Smooth texture only. Buff and Tan colors.

Samples cheerfully furnished upon request.

Name	Size, inches	Exposure to weather, inch	Pieces per square	Weight per square, lbs.
"Fighting Cocks Tavern"	7x14⅜x½	6	355	1500
"Yorkshire"	6x15x½	6½	380	1550
"Normandy"	6x15x½	6½	380	1550
"Sussex" or "Devonshire"	9x12x½	5	335	1600
	9x15x½	6½	260	1450
	7x15x½	6½	325	1350
	6x15x½	6½	380	1550
"Dresden"	8x13	10	215	1000
"Sussex"	9x15x⅜	6½	260	1150
"Barcelona"	18x8	15	170	1150
"Toledo"	15x7	12	280	1500
"Lombardy"	18x8	15	170	1150
"Riviera"	15x8	12	210	1100
"Habana"	18x8	15	170	1100

MURRAY TILE COMPANY

INCORPORATED

Manufacturers of Roofing Tile and Quarry Tile

CLOVERPORT, KENTUCKY

SALES REPRESENTATIVES

MIAMI, FLA., H. J. Pilliod, 101 N. E. 25th St.
NEW ORLEANS, LA., Roofers Material and Equipment Co., 439 Baronne St.
NEW YORK, N. Y., C. H. Vanderlaan, Inc., 103 Park Ave.
ST. LOUIS, MO., R. V. Hughes, 911 Locust St.

PRODUCTS

Spanish Roll Roofing Tile, Mission Roofing Tile and Flat Shingle Roofing Tile.

Packing House Heavy Duty Quarry. (For this item see File Index.)

Quarry Tile and Trim, for Floors, Wainscots and Promenade Roofs, Stair Threads, and Risers, Threshold Tile, Window Stools and Returns, Plinth Blocks. (For these items see File Index.)

MURRAY ROOFING TILES

Produced since 1904 from fine quality clays and shales, expert methods of manufacture insure a permanently beautiful, weathertight tile with definite insulating qualities. A variety of types, sizes and textures in appropriate colors afford a suitable selection to meet individual requirements of architectural design.

DESCRIPTION OF TILE

Rustic—

Shingle tile of slightly varying thickness and sufficient warpage to produce roof texture. Furnished in fireflashed shades of reds, browns, tans, gunmetal and burnt umber tones or in a graduation from black to red.

Victorian—

Flat slab shingle with wood-grained texture. Furnished in same shades as Rustic.

Rough Velvet—

Shingle tile with irregular machine scoring to absorb light rays and to present a soft velvety effect. Furnished in fireflashed shades of light and dark tan, reds, browns, and running into variation of deep gunmetal shades.

Saxony—

Shingle. Almost smooth in texture but with just enough fine combing to break light rays. Furnished in same colors as Rough Velvet.

Mission—

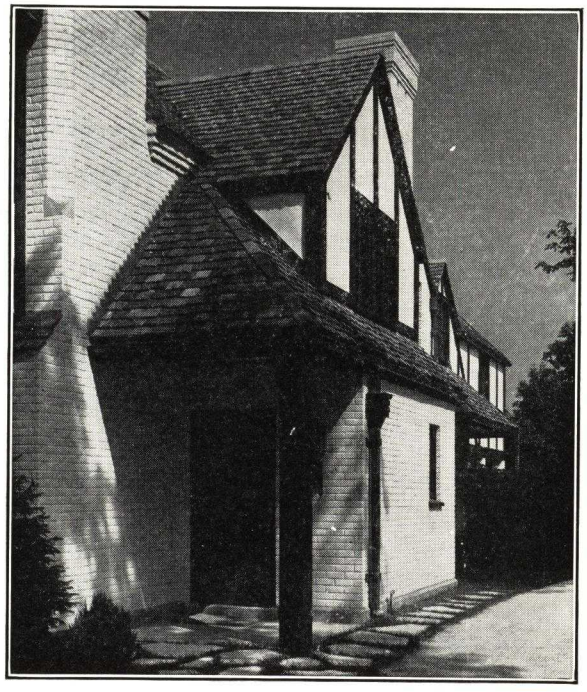
True Spanish Mission tile with fine needlepoint texture or rough machine scoring and available in a full range of shades, including variations of buff, orange, light and dark tan, mingled reds and dark flashed tones.

Spanish Roll—

Furnished in same shades as Mission.

OTHER COLORS

Murray roof tiles are also available in glazed green and dull slip colors of green, mingled brown, black and in some cases white upon special order.



Rustic Shingle Tile Red to Black Range—E. C. Austin Residence, Glencoe, Ill.
Ralph E. Stoetzel, Architect.
Frank Starr & Sons, Roofing Contractor.

Name	Size, inches	Exposure, inches	Pieces per square	Weight per square, pounds
Rustic Shingle	7x15x⅛-⅝	7x6½	317	1400
Victorian Shingle	7x15x½	7x6½	317	1250
Rough Velvet	8x15x½	8x6½	277	1250
Mission	8x18	15	170	1200
Spanish Roll	10½x13¼	8¼x10¼	171	900

THE M. N. CARTIER & SONS CO.

Only Manufacturers of "Clason" Wire Snow Guard for Roofs

Cartier Building, 275 Canal Street
PROVIDENCE, R. I.

"CLASON" WIRE SNOW GUARDS

For Slate, Tile, Asbestos, Shingle, Metal, and Other Steep Roofs

The Guards

The "Clason" has been used for many years and has given uniformly satisfactory service; it is one of the strongest guards made.

"Clason" Snow Guard for New Roofs

Note from the illustration that the "butterfly" loops brace and strengthen each other, while the extension brace lends additional strength.

Their Purpose

To lessen chances of damage suits against owners of property by increasing both personal and property safety.

There are many buildings so situated that the use of snow guards is essential to personal safety; there are more cases where the use of snow guards could protect the surrounding roofing and sheet metal work against costly damages.

Sliding snow and ice often injure roofings, and puncture or tear away gutters, etc. The use of our snow guards forestalls these dangers, as they hold the ice and snow where they form. They are a cheap and unobtrusive preventive against damage.

Important

We note a growing tendency to permit the installation of three, four, or five courses of snow guards near the roof eaves. The result is that a few guards are compelled to hold not only the weight of snow and ice which they are located to care for, but also to withstand the tremendous tearing force of slides starting from the roof surfaces above.

No guards will withstand such conditions, and their installation in such a manner precludes the *purpose* for which they are used. When specifying our guards please do so according to our table and *insist* upon the roofer following the specification.

An Installation of "Clason" Snow Guards

Manufacture

We make our guards in our own plant, and are not dependent upon the facilities or services of others. These guards are manufactured either from pure copper wire or galvanized steel wire, both selected for ductility and stiffness. No copper-covered steel wire is used.

Practicality

Our wire snow guards combine strength, long service, economy and unobstructive design.

Types of "Clason" Snow Guards

New roofs, 1 and 2-in. points.
Hook and friction for old roofs.
Solder-to-metal-roof.
Special for Spanish tile.
Special for asbestos shingles.
2-in. loop and 2-in. point "Clason" Snow Guards for flat tile and thick slate roofs.

Number Per Square

The following table gives the approximate number of snow guards which may be safely specified for use in each 100 sq. ft. of roof surface:

Roof Pitch	Number of Guards
One-quarter	50
One-third	75
One-half	125

Towers, and steeper roofs than above indicated, may require special consideration.

How to Specify

Apply to all pitched roofs "Clason" [for old roofs "Clason Special"] Snow Guards, as made by The M. N. Cartier & Sons Co., Providence, R. I. The guards to be made from pure copper [galvanized steel] wire.

(Here specify the number of guards required per square, dependent upon the pitch of the roof and other special conditions.)

In applying the snow guards, the eaves course of the roofing material shall be laid as usual, but the next course shall be laid with the joints slightly open to receive the shank of the snow guard.

After striking the line for the third course of the roofing material, place the guards in the joints, with the loop just below the lap of the course, and drive the prong into the roof decking; then lay the course, leaving only the loop exposed.

Care must be used to insure having the shank well sunk into the joints, so that the following course of roofing material will lie flat and not bear upon the guard.

(*Note:* The architect or engineer may omit at his discretion the method of application of the guards.)

DAVID LEVOW

Manufacturers of Snow Guards, Leader Straps, Skylight Gearing, Roof Strainers

TELEPHONE
CHelsea 3-2400

308 West 20th Street, NEW YORK, N. Y.

ADJUSTABLE PIPE SNOW GUARDS

"Fitrite" Adjustable Pipe Snow Guards

Made of galvanized malleable iron and bronze for roofs of slate, Spanish tile, metal and other steep roofs.

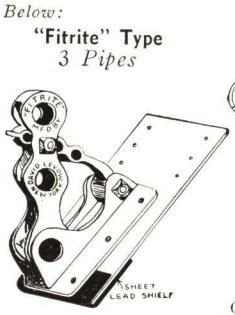
Size of Plate—"Fitrite" Snow Guard plates are the same size as slate, and are ⅛-in. thick for standard No. 1 slate, unless otherwise specified.

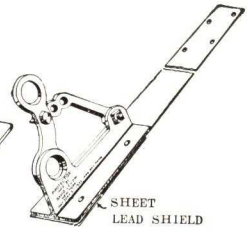
Application and Installation—Adjustable to any pitch. To be used with three (3) galvanized iron or brass pipes, ¾-in. I.P.S. (1.05 in. o.d.). "Fitrite" Pipe Snow Guards are installed along eaves of roof, placing brackets 5 or 6 ft. apart. Plate takes the place of slate and is fastened with No. 14 wood screws.

Features—Underside of snow guard is lined with a special sheet lead shield, which prevents sharp edges of plate from coming in contact with slate and eliminates the possibility of cracking or breaking of slate. Shield is so attached that rivets do not come in contact with slate.

Below:

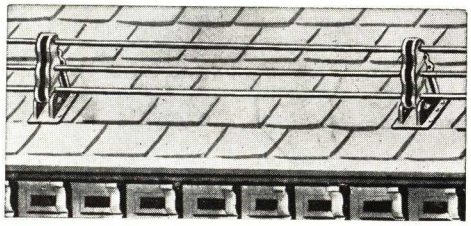
"Fitrite" Type
3 Pipes





"Protector" Type
2 Pipes

On *old roofs* use "Protector" Guards with 12 in. long plate spaced 5 to 6 ft. apart, push plate between slate nail holes being at joint of slates, fasten to roof with special copper screw nails through holes drilled in lower slate. To prevent water leaks, insert copper flashing to cover nail heads.



Adjustable to Pitch of Roof

"Protector" Adjustable Pipe Snow Guards

Especially designed for residential or other small buildings with slate roofs having rafters not over 18 ft. long.

This 2-pipe guard has all features of the "Fitrite" type popular for many years on larger buildings. Made of bronze with lead shield and copper plate 2-in. wide by $\frac{1}{16}$-in. thick, for two (2) brass pipes ½-in. I.P.S. (.84 in. o.d.)

On new roofs, "Protector" Snow Guards, with 24-in. long plates, are placed 5 to 6 ft. apart. (*For old roofs, see note at left.*) The bracket is set over one of the lower rows of slate and nailed through top holes in plate directly to roof boards with heavy copper screw nails. Next row of slate goes over the plates.

Short Specification

All slate roofs shall be provided around eaves with ["Fitrite" Adjustable Pipe Snow Guards] ["Protector" Adjustable Pipe Snow Guards] as manufactured by DAVID LEVOW, 308 West 20th Street, New York, and installed in accordance with the manufacturer's instructions.

(Note: Detailed specification on request.)

(Specifications for Mission, Spanish or Shingle Tile are the same as for slate roof, except mention kind of tile to be used.)

A Few Recent Installations of Adjustable Pipe Snow Guards

(BUILDING, LOCATION AND ARCHITECT)

†Hotel Pennsylvania, New York, N. Y., McKim, Mead & White
†Metropolitan Life Insurance Co., Sanitarium, Mt. McGregor, N. Y., D. Everett Waid
U. S. Post Office, Brooklyn, N. Y.
†Temple Emanu-El, Fifth Avenue, New York, N. Y., Robert D. Kohn
*Kings County Hospital, Brooklyn, N. Y., LeRoy P. Ward, Inc.
St. Joseph School, Maplewood, N. J., McKenna & Irving
Ridgewood High School, Ridgewood, N. J., Fanning & Shaw
St. Michael's Church, Amsterdam, N. Y., Morgan & Millaman
Roosevelt High School, Yonkers, N. Y., C. Howard Chamberlain
Howard University, Washington, D. C., A. I. Cassell
Museum of Natural History, N. Y., Trowbridge & Livingston
U. S. Government Theatre, Mitchel Field, Long Island, N. Y.
War Department Theatre, Fort Riley, Kan.
General Courthouse, Jamaica, N. Y., Alfred H. Eccles and Wm. W. Knowles
‡Crippled Children's Home, Port Jefferson, L. I., N. Y., E. J. Berlenbach
Model Home, Elizabeth, N. J., C. Godfrey Poggi

*Mission Tile. †Metal Roof. ‡Spanish Tile

"FITRITE" BRONZE BEEHIVE STRAINERS

For Outside Leaders

Material and Sizes—Solid bronze. 3, 4, 5, 6, 7, and 8-in. diameter; also 2x3 and 3x4-in. square.

Features—Solid cast bronze strainer. Practically unbreakable. Will last for the life of the building.

Specifications—All outside leaders shall be installed with "Fitrite" Bronze Beehive Strainers of the proper size as manufactured by DAVID LEVOW, 308 West 20th Street, New York, N. Y.

"FITRITE" HINGED BRONZE LEADER STRAPS

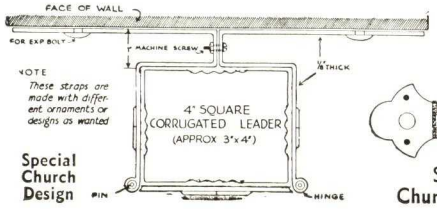
Material—Made in solid cast bronze. Heavy construction makes its use especially desirable where permanence is essential.

Sizes—Made for 3- and 4-in. round or corrugated pipe. Also for 3x4-in. square corrugated pipe and any special size to order. Straps can be furnished with cross, initials or other ornamentation, if desired.

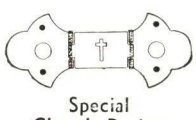
Installation—To be fastened to wall with four expansion bolts. (Holes in straps are properly spaced for brick joints). When installed, pipe remains 1 in. from face of building.

Features—Right side of strap is permanently hinged. Left side has loose-pin which permits removing leader for replacement without taking strap from wall. Strap is so constructed that machine screw can be adjusted to take care of variations in size of pipe and assures leader being held firmly in position.

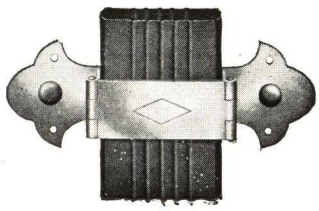
Specifications—All leaders or conductor pipes shall be fastened to wall with "Fitrite" Hinged Bronze Leader Straps, of the proper size, as manufactured by DAVID LEVOW, 308 West 20th Street, New York, N. Y.

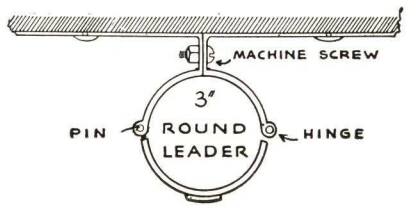


Special Church Design



Special Church Design





JOHNS-MANVILLE

EXECUTIVE OFFICES
22 East 40th Street, NEW YORK, N. Y.

Products

JOHNS-MANVILLE TRANSITE PRODUCTS.
For the following Johns-Manville products, see File Index: Transite Walls; Acoustical Treatment; Asbestos and Asphalt Shingles; Built-up Roofs; Insulated Roofs; Home Insulation; Insulating Board; Pipe Coverings and Insulations; Asphalt Tile Flooring; Asbestos Wainscoting and Flexboard; Flush Doors; Steeltex for Plaster, Stucco, and Brick or Stone Veneer; Steeltex Floor Lath and Welded Wire Reinforcement.

JOHNS-MANVILLE TRANSITE PRODUCTS

Corrugated Transite Roofing and Siding

Corrugated Transite Asbestos Roofing and Siding is made of asbestos fibres and portland cement united under hydraulic pressure into dense, unlaminated, monolithic sheets of great strength and rigidity. It is designed for application directly over purlins or girts of skeleton steel or wood frame construction. It will not burn or rust, rot, split, crack or curl. In color, it is an attractive light gray. It is weatherproof, highly resistant to corrosion and requires no painting to preserve it.

Laying J-M Corrugated Transite Roofing
The cut corner construction permits a tight joint with straight lap lines

Transite can be readily drilled or sawed and is secured with bolts, screws, clips, etc., designed for that purpose. Special shapes of the same material for use as ridge roll, corner roll, louvres, etc., are available.

Sizes—Sheets are furnished 42 in. wide in lengths up to 11 ft. They are approximately $\frac{7}{16}$ in. thick at ridges and valleys of corrugations and approximately $\frac{5}{16}$ in. thick at the slope. The corrugations are 4.2-in. pitch. The over-all thickness of the sheets is 1½ in. Approximate weight, 4.1 lbs. per sq. ft. uncrated.

Application—See details on following page. Transite may be applied over roof purlins spaced on not greater than 54-in. centers (minimum roof pitch 2 in. per foot), and on siding girts not over 66 in. center to center. Sheets are laid with a 6-in. end lap and a one-corrugation side lap, providing an exposure of 37.8 in. Complete details are given in Brochure TR-12A.

Flat Transite Sheets

Flat Transite has the same characteristics as Corrugated Transite. It is generally regarded as the outstanding fireproof, corrosion-resistant building sheet on the market today. Its attractive, light gray color and interesting texture also offer definite decorative possibilities.

Flat Transite does not become warped, distorted or weakened in service; in fact, it actually strengthens and toughens with age. It offers high resistance to acid fumes and severe weather conditions and finds a wide use in industrial plants, as well as in hospitals, libraries, office buildings, railway stations, machine shops, garages and residences. Its easy workability and the speed with which the large units can be erected are but two of its many advantages.

Transite weighs approximately 124 lbs. per cu. ft. Sheets are furnished in sizes 36x48 and 42x48 in. in thicknesses of ⅛ to 4 in.; 48x48, 42x96 and 48x96 in. from $\frac{3}{16}$ to 2 in. thick.

Transite Walls

Transite Walls for office partitions are fully described in another section. See File Index.

W. R. Transite

Both Flat and Corrugated Transite sheets can be furnished with a bituminous impregnation to afford maximum impermeability where the material will be subjected to extreme or sustained moisture or acid conditions.

W. R. Flat Transite is furnished in standard size sheets, 42x96 in., ¼ in. thick; 42x48 in., ⅛, $\frac{3}{16}$ and ¼ in. thick; and 36x48 in., ⅛ and $\frac{3}{16}$ in. thick. Smaller sizes can be furnished on special order. W. R. Corrugated Transite is furnished in the same sizes as standard Corrugated Transite, but in lengths only up to and including 8½ ft.

Transite Flues and Stacks

Transite Pipe, one of the newest J-M asbestos-cement products, is already being widely used for venting gas burning appliances because of its unusual resistance to corrosive gases and fumes. The material is supplied in either round or oval form and in a full range of diameters. For complete data on Transite Flue Pipe and accessories, ask for Brochure TR-13A.

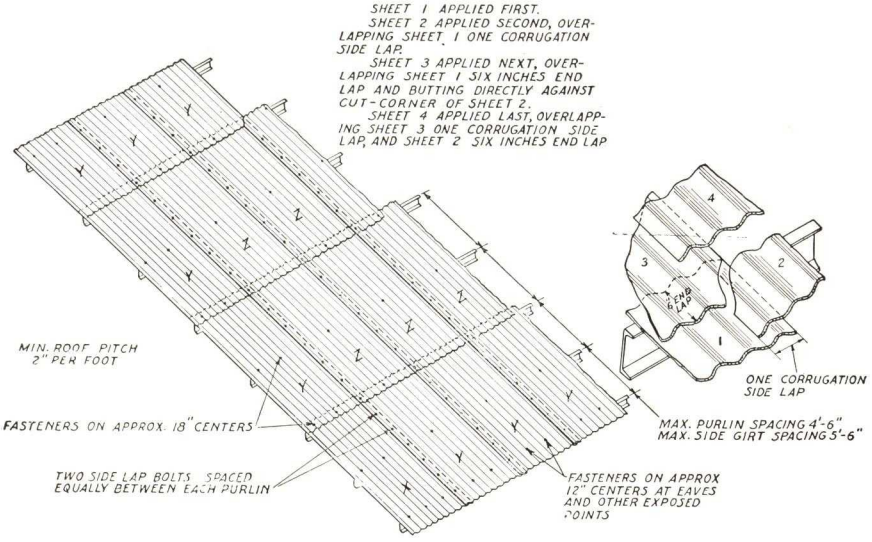
This same material is also being widely used as industrial stacks, particularly where corrosive fumes may be encountered.

Transite Ventilators

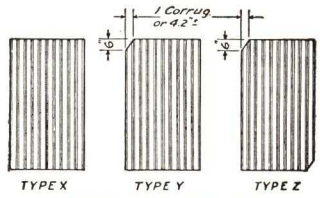
Transite Ventilators, made from Transite Pipe, are designed for use on all buildings where fireproof, fume-proof and weather-proof construction is desired. They are especially satisfactory for engine houses, gas and power houses, laboratories, factories, etc., where a corrosion-resisting ventilator is essential. They never need painting to preserve them and have proved most economical because of their permanence and virtual freedom from maintenance.

Sizes 10 to 24 in. are shipped assembled. Larger sizes are shipped knocked down.

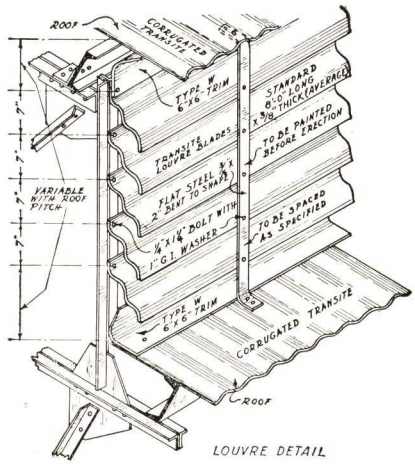
CORRUGATED TRANSITE CONSTRUCTION DETAILS



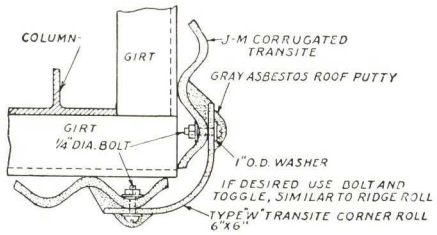
STRAIGHT LAP LINE CONSTRUCTION WITH CUT-CORNER SHEETS



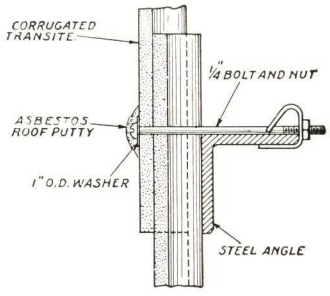
TYPES OF SHEETS FOR CUT-CORNER CONSTRUCTION



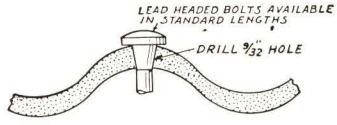
LOUVRE DETAIL



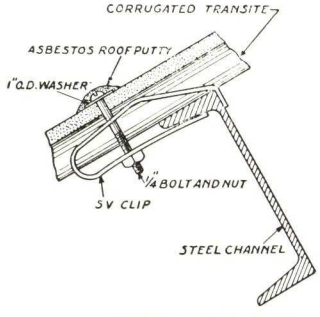
SECTION SHOWING CORNER ROLL



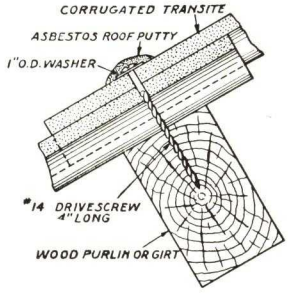
DETAIL OF HOOK CLIP



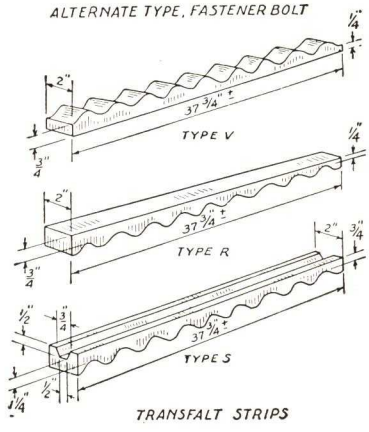
ALTERNATE TYPE, FASTENER BOLT



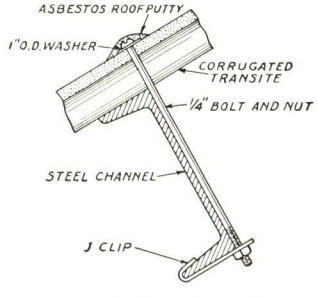
DETAIL OF SV CLIP



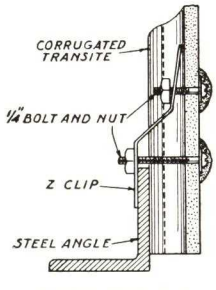
DETAIL OF DRIVESCREW



TRANSFALT STRIPS

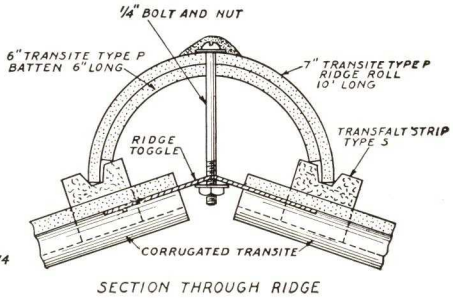


DETAIL OF J CLIP



DETAIL OF Z CLIP

PATENTS Nos. 1,489,474
2,015,129 & 2,021,929
PAT'D. CANADA 1925.



SECTION THROUGH RIDGE

KEASBEY & MATTISON COMPANY

AMBLER, PA.

DISTRICT OFFICES

ATLANTA, GA. CLEVELAND, OHIO CHICAGO, ILL. HOUSTON, TEX.
NEW YORK, N. Y. PHILADELPHIA, PA. SAN FRANCISCO, CAL.

For K&M "Century" Asbestos Roofing and Siding Shingles, Pipe, Sheet and Block Insulations, Mineral Wool Home Insulations, Asbestos, Corrugated Decorative Wallboards, see File Index

K&M "Century" TRAFFORD TILE SIDING

K&M "Century" Trafford Tile is composed of asbestos fibre and Portland cement and is a structural sheet material used for siding in industrial construction.

The main purpose in corrugating any material of this sort is to increase the strength of the sheet. The corrugations also help to obtain correct alignment during application. In Trafford Tile a new principle has been employed, whereby the corrugations are scientifically shaped and spaced to provide an unusually high degree of strength and rigidity. This is in accordance with the most modern engineering practice, which substitutes a scientific distribution of material for the older method of gaining strength through sheer volume and mass.

The result is that Trafford Tile combines relatively light weight with high strength. Aging increases this strength, and the material becomes harder and more durable with the passing of time.

Trafford Tile is fire-resisting, weather-resisting and never needs protective painting. The color is a pleasing gray.

Uses

Trafford Tile has been very successfully used as siding in industrial buildings, warehouses, hangars, garages, chemical plants and oil refineries.

Trafford Tile may also be used for temporary constructions such as tool houses, construction offices, workmen's bunkhouses, where its relatively low cost is an important factor.

Dimensions

Width—Nominal 43 in. (4 corrugations, 3 flats per sheet) (Net coverage width, 40 in.).

Thickness—Approximately ¼ in.

Maximum Girt Space (Siding)—5 ft. centers.

Weight—Approximately 2.2 lbs. per sq. ft. uncrated.

Add approximately 20% for crating.

Standard lengths 3 ft. up to 10 ft., rising in 6 in. increments.

Specification

Cover the side of the building as designated on the plans with Asbestos-Cement Trafford Tile sheets as manufactured by KEASBEY & MATTISON COMPANY, Sheets shall be approximately 43 in. wide and of suitable length so that all end laps shall occur over a girt. Sheets shall be applied straight line method with 6 in. end laps and one corrugation for side lap.

Sheets shall be composed solely of asbestos fibre and Portland cement, the percentage of asbestos fibre shall not be less than 14% by weight. Sheets shall be dense and tough, manufactured with the weather side relatively smooth. All sheets shall be of American manufacture and manufacturer shall be able to show satisfactory installations. Thickness shall average not less than ¼ in. Color to be cement gray.

The manufacturer's standard corrosion-resisting fasteners shall be used.

Where indicated on the plans, flashing to be of 4 lb. sheet lead (or 16 oz. copper).

Characteristics

Fire-resisting—Highly resistant to internal and external fires. Prevents spread of fires from building to building.

Weather-resisting—Unaffected by the natural elements. It is little affected by sudden temperature changes peculiar to certain industries.

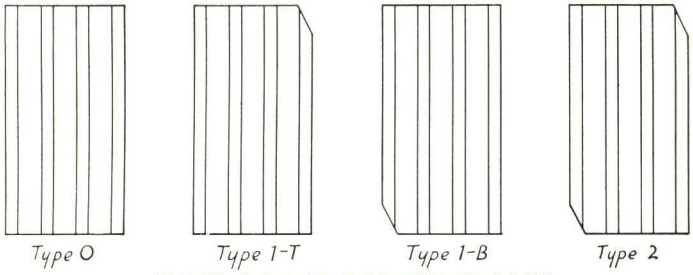
Corrosion-proof—Will not corrode, rot or disintegrate.

Appearance—A pleasing, light gray color that assures permanent attractiveness to a building.

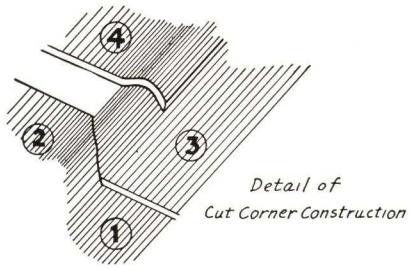
Workability—A material of great natural strength, easily cut with a portable electric saw and drilled for bolts or drive-screws.

Economy—Relatively low initial cost, little maintenance and long life make Trafford Tile an ideal siding material.

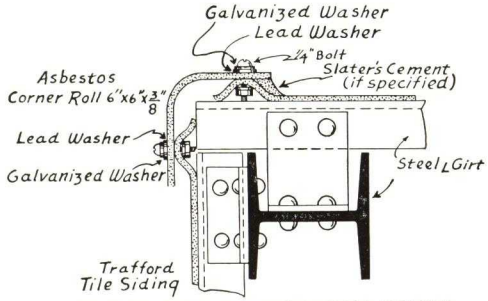
K&M "Century" TRAFFORD TILE SIDING (Continued)



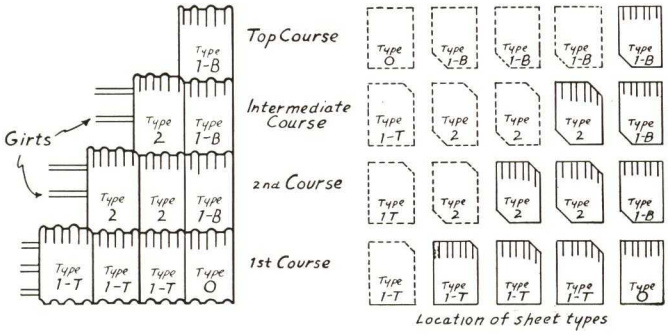
TYPES OF CUT CORNER SHEETS



FILLER UNIT

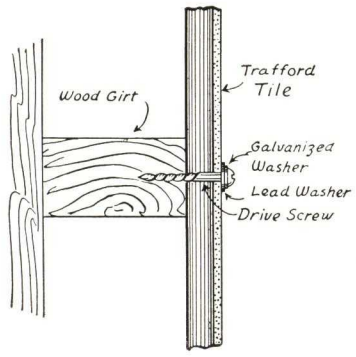


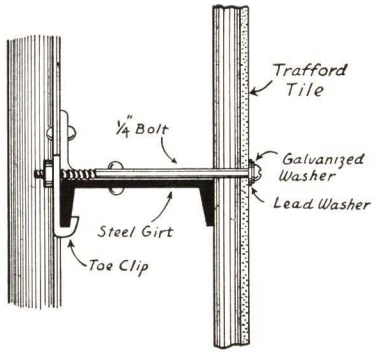
CORNER ROLL CONSTRUCTION DETAIL

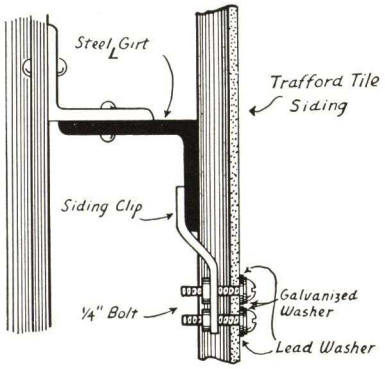


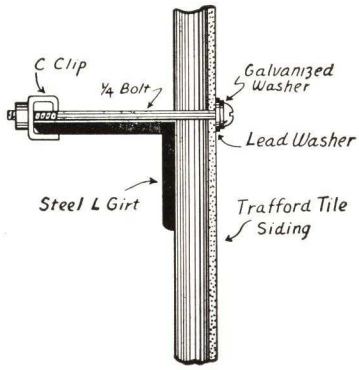
METHOD OF APPLYING SHEETS

Sheets are applied from right to left, in the order designated above.









FASTENERS - CONSTRUCTION DETAIL

KEASBEY & MATTISON COMPANY

AMBLER, PA.

DISTRICT OFFICES

ATLANTA, GA. CLEVELAND, OHIO CHICAGO, ILL. HOUSTON, TEX.
NEW YORK, N. Y. PHILADELPHIA, PA. SAN FRANCISCO, CAL.

For K&M "Century" Asbestos Roofing and Siding Shingles, Pipe, Sheet and Block Insulations, Mineral Wool Home Insulations, Trafford Tile, Decorative Wallboards, see File Index

K&M "Century" ASBESTOS CORRUGATED ROOFING AND SIDING

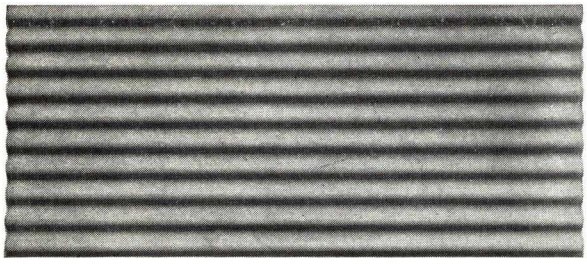
K&M "Century" Corrugated Asbestos is composed of asbestos fibre and Portland cement which, after proper mixing, are subjected to great pressure. The result is a strong, dense, tough sheet of fire-resistant and weather-resistant material. The corrugations not only increase the strength of each sheet but permit correct alignment and result in water-tight joints.

K&M "Century" Corrugated Asbestos can be cut with a portable electric saw, and can be drilled for nails, drive-screws, or bolts. It is a very economical form of roofing and siding as it will not rot, rust or corrode. It never requires protective painting.

STANDARD LENGTHS—SQ. FT. AREA OF SHEETS

Length	Sq. ft. area	Length	Sq. ft. area	Length	Sq. ft. area
3′-0″	10.50	6′-0″	21.00	9′-0″	31.50
3′-6″	12.25	6′-6″	22.75	9′-6″	33.25
4′-0″	14.00	7′-0″	24.50	10′-0″	35.00
4′-6″	15.75	7′-6″	26.50	10′-6″	36.75
5′-0″	17.50	8′-0″	28.00	11′-0″	38.50
5′-6″	19.25	*8′-6″	29.75	11′-6″	40.25
				**12′-0″	42.00

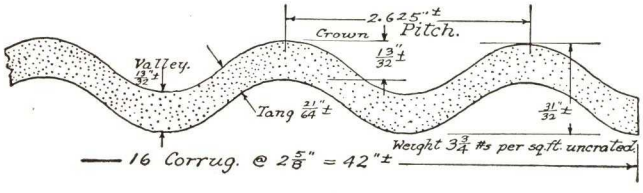
*Maximum length in 2.625 in. pitch is 8 ft. 6 in.
**Maximum length in 4.2 in. pitch is 12 ft.



Uses

Roofing, siding and partitions in skeleton frame buildings such as: storehouses, power houses, exposition units, cooling towers, docks, hangars and similar structures.

In specific industries, where unusual conditions exist. "Flare Back Walls" around tanks in oil refineries to prevent spread of burning oil, in chemical plants to withstand the effects of fumes and acids, in railroad roundhouses, freight houses and car sheds where a heavy duty roofing and siding material is required.



Asbestos Corrugated

(2.625 in. pitch)

Width—42 in. (16 corrugations per sheet.)
Thicknesses—approximately
Ridge and valley—13/32 in.
Slope—21/64 in.
Depth—31/32 in.
Pitch—2.625 in.
Maximum purlin space (roof)—4 ft.
Maximum girt space (siding)—5 ft.
Weight—3.75 lbs. per sq. ft. uncrated.
Add 20% for crating.
Standard lengths—See table at top of next column.
*Maximum length in 2.625 in. pitch is 8 ft. 6 in.

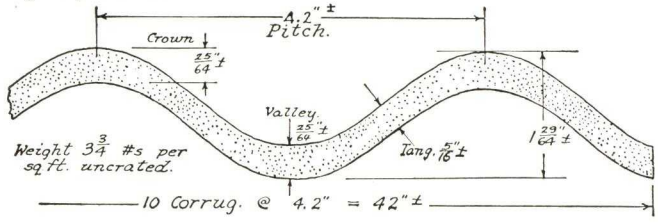
Specification

Cover roof and sides of building with K&M "Century" Asbestos Corrugated sheets. Color to be cement gray. All sheets shall be 4.2 in. (or 2.625 in.) pitch—center to center of corrugations. Sheets shall be approximately 42 in. wide and shall be applied staggered joint (or straight line) method with 6 in. end laps.

Thickness at crest and vale of corrugations shall average not less than 11/32 in.; at slope not less than 9/32 in. Weight shall be 3.75 lbs. per square foot, uncrated normal shipping weight.

The manufacturers corrosion-resisting fasteners shall be used and all sides and end laps of roofing shall be cemented with Black Asphalt Cement. Flashing to be of 4 lb. sheet lead or 16 oz. copper. Application to be in strict accordance with manufacturers printed instructions.

Complete details for application of roofing, siding, flashing, ridge and corner construction and fastening to structural members or flat surfaces will be gladly furnished by our Engineering Department.

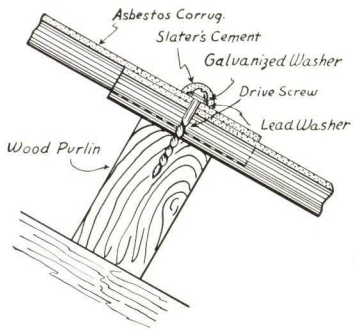


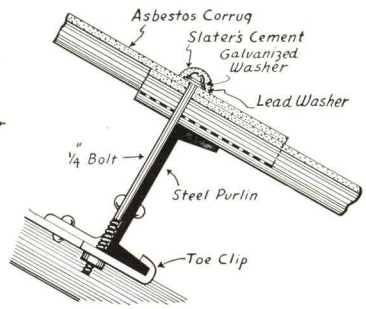
Asbestos Corrugated

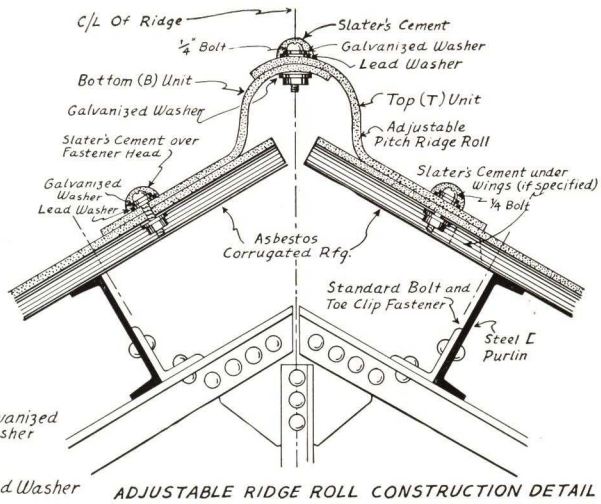
(4.2 in. pitch)

Width—42 in. (10 corrugations per sheet.)
Thicknesses—approximately
Ridge and valley—25/64 in.
Slope—5/16 in.
Depth—1 29/64 in.
Pitch—4.2 in.
Maximum purlin space (roof)—4 ft. 6 in.
Maximum girt space (siding)—5 ft. 6 in.
Weight—3.75 lbs. per sq. ft. uncrated.
Add 20% for crating.
Standard lengths—See table at top of this column.
**Maximum length in 4.2 in. pitch is 12 ft.

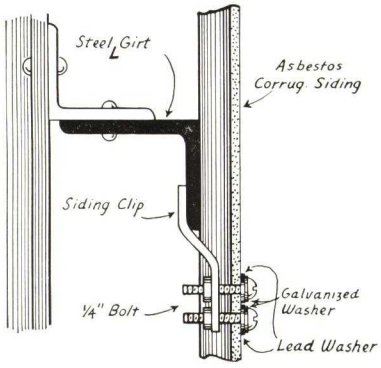
K&M "Century" CORRUGATED ROOFING AND SIDING (Continued)

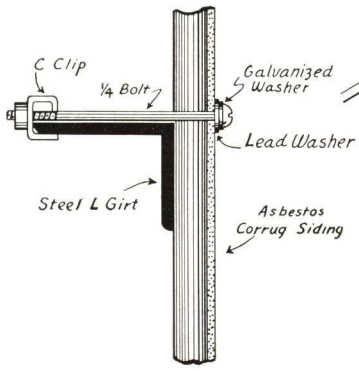




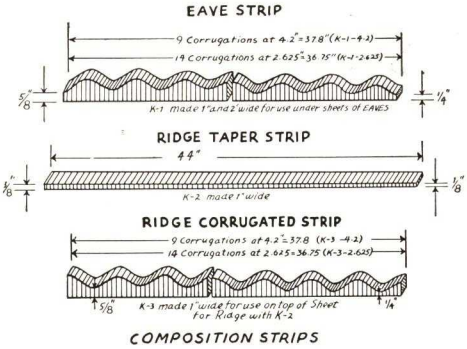


ADJUSTABLE RIDGE ROLL CONSTRUCTION DETAIL

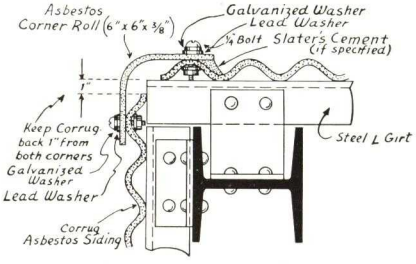




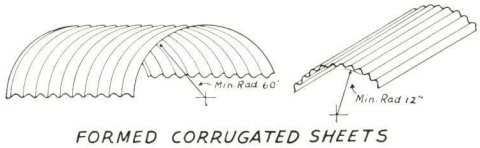
FASTENERS - CONSTRUCTION DETAIL



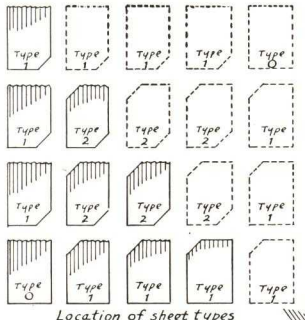
COMPOSITION STRIPS



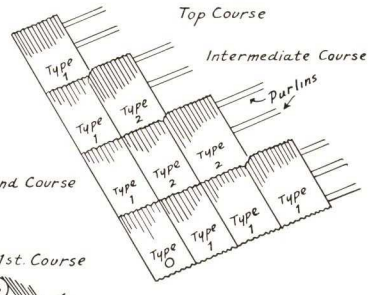
CORNER ROLL CONSTRUCTION DETAIL

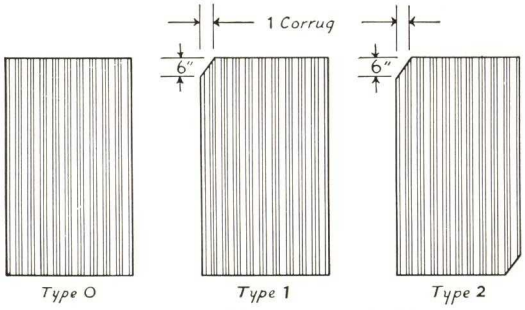


FORMED CORRUGATED SHEETS

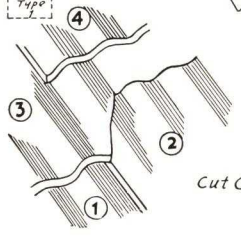


Location of sheet types





TYPES OF SHEET FOR STRAIGHT JOINT METHODS OF APPLICATION



Detail of Cut Corner Construction

STRAIGHT JOINT METHOD OF APPLYING SHEETS WITH CUT CORNERS

Sheets are applied from left to right, in the order designated above.

Sheets can also be applied by the "Staggered Joint Method" which does not require sheets with cut corners.

H. H. ROBERTSON COMPANY

Robertson World-Wide Building Service

PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CANADA; ELLESMERE PORT, CHESHIRE, ENG.

DISTRICT OFFICES, AGENCIES AND BRANCH OFFICES

ALLENTOWN, PA., H. N. Crowder, 446 Union St.
BALTIMORE, MD., H. H. Robertson Company, 1635 Baltimore Trust Bldg.
BIRMINGHAM, ALA., H. H. Robertson Company, 805-8 Protective Life Bldg.
BOSTON, MASS., H. H. Robertson Company, 344 Rock Island Rd. (Quincy, Mass.)
BUFFALO, N. Y., H. H. Robertson Company, 602 Jackson Bldg.
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EASTON, PA., H. N. Crowder, 103 No. Fourth St.
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LOS ANGELES, CALIF., H. H. Robertson Company, 816 W. Fifth St.
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MINNEAPOLIS, MINN., Hauenstein & Burmeister, 614 Third Ave., So.
NASHVILLE, TENN., John McDougal, 2210 Elliston Pl.
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NEW ORLEANS, LA., H. H. Robertson Company, 736 Whitney Bank Bldg.
NEW YORK, N. Y., H. H. Robertson Company, 475 Fifth Ave.
PHILADELPHIA, PA., H. H. Robertson Company, 1307 Real Estate Trust Bldg
PITTSBURGH, PA., H. H. Robertson Company, 2000 Grant Bldg.
PORTLAND, ORE., Mercer Steel Company, 838 N. W. 13th Ave.
RICHMOND, VA., R. M. Nolting, 1103 E. Main St. (P. O. Box 1011)
ST. LOUIS, MO., H. H. Robertson Company, 1218 Olive St.
SALT LAKE CITY, UTAH, L. Brandenburger Co., 153 W. Second South St.
SAN FRANCISCO, CALIF., H. H. Robertson Company, 149 New Montgomery St.
SCRANTON, PA., F. H. Coffin, 210 Brooks Bldg.
SEATTLE, WASH., Arthur A. Dally, 332 Pioneer Bldg.
SYRACUSE, N. Y., F. J. Ludwick, 1126 Chimes Bldg.
TULSA, OKLA., Murray R. Womble, 316 Atco Bldg.
WASHINGTON, D. C., J. R. Nichols, 428 Woodward Building

For England: H. H. ROBERTSON COMPANY, MERSEY IRON WORKS, Ellesmere Port, Cheshire

FOR CANADA: H. H. ROBERTSON CO., LTD.
TORONTO (MAIN OFFICE), 611 Metropolitan Building — MONTREAL OFFICE, 526 Confederation Building

Products

ROBERTSON PROTECTED METAL (RPM) ROOFING, SIDING, FLASHINGS, GENERAL BUILDING TRIM, DUCTS, etc.; also available in Ventilators, Louvers, Hoods and Ducts.

ROBERTSON PROTECTED METAL V-BEAM ROOFS for decks under insulation and built-up roofing; for extra-load-carrying roofs without insulation; or for siding.

COPPER COVERED ROBERTSON PROTECTED METAL—RPM with an attractive outer covering of Anaconda "Electro-Sheet" Copper. Also furnished with an aluminum surface and with an aluminum paint finish.

For Robertson Ventilators, Weatherproof Skylights, Side-wall Sash, Robertson Steel Floor Wiring System, and Robertson Steel Floor, see File Index.

TRADE-MARK

Patents

Robertson Protected Metal, Robertson V-Beam Sheets, Aluminum Covered RPM, Aluminum Finished RPM, and Copper Covered RPM are protected by United States Patents: Nos. 1,410,790; 1,418,347; 1,418,348; 1,421,338; 1,432,512; 1,536,549; 1,536,550; 1,593,205; 1,812,732; 1,838,349; 1,864,971; 1,904,341; 1,973,193; 2,025,929; 1,465,563; 1,534,868; 1,863,186; 1,889,770; 1,936,228; 1,956,219; 1,982,243. Other patents allowed and pending in United States, Canada, England, France, Belgium, Australia, Japan, and New Zealand.

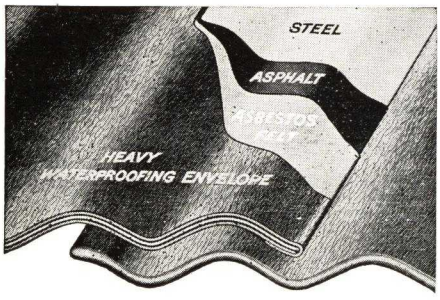
ROBERTSON PROTECTED METAL (RPM)

Robertson Protected Metal is a steel roofing and siding material protected against rust, weather and corrosion by a series of external, factory-applied coatings. These coatings are shown on the cutaway drawing below. Copper Covered RPM (described on next page) is the same, except for the outer coating, which is of beautiful Anaconda "Electro-Sheet" copper.

Types of Destructive Agencies It Withstands—RPM has successfully withstood the destructive agencies listed below, on all types of buildings and in all climates. Installation lists are available.

Sulphuric acid	Caustic soda	Various alkalies
Hydrochloric acid	Nitric acid	Moisture
Hydrofluoric acid	Benzoic acid	Smoke
Hypochlorous fumes	Acetic acid	Condensation
Phosphoric acid	Ammonia fumes	Salt air, etc.

Complete figures showing results of comparative tests on RPM and other materials under actual conditions and the savings in costs over a period of years may be obtained on request.



Robertson Protected Metal

Cutaway view showing protective layers which cover the steel and prevent corrosion: (1) asphalt; (2) asphalt-impregnated asbestos felt; (3) heavy waterproofing envelope (a factory applied sealing coat)

Reduction of Heat Loss—RPM provides greater insulation than unprotected metal sheets, because of the natural insulation of the protective coatings on each side, and also because the slightly "tacky" nature of the external envelope of RPM causes the overlapping sheets to seal themselves together into one continuous sheet and thus prevents infiltration of cold air.

DIMENSIONS, GAUGES, WEIGHTS, COVERAGE OF ROBERTSON PROTECTED METAL

Lengths, 5 to 12 ft., inclusive. Also in odd lengths as specified

	Number of corr. or beads	Width and depth of corr., in.	Gross width of sheet, in.	Net covering width, in.	Side lap	Ga.	Weight per 100 sq. ft. material area, lbs. Net	Crated
Corrugated roofing	12½	2⅝x⅜	33	29¾	1½ corr.	24	185	200
						22	210	225
Corrugated siding	13	2½x⅜	33	31	1 corr.	20	240	255
Mansard	6*	2½x1	33	30	1 bead	18	295	310
V-beam	5**	1¾ Deep	29	26¾	1½ v.	24	215	240
						22	245	270
						20	280	305
						18	345	370

*6 in. c. to c. **5.3 in. c. to c.

RPM is furnished in two standard colors: black and maroon. It can also be supplied with aluminum finish (bright or dull) on one or both sides, also with surfaces of Anaconda "Electro-Sheet" Copper and aluminum foil.

RECOMMENDED PURLIN AND GIRT SPACINGS FOR RPM

Ga.	Corrugated Roofing: Slopes over 3 in. in 12 in. ft. in.	Corrugated Roofing: Slopes under 3 in. in 12 in.* ft. in.	Siding, ft. in.	V-Beam, ft. in.
24	4 9	.....	4 10	7 0
22	5 9	4 9	5 10	8 0
20	6 6	5 9	6 8	8 9
18	7 6	6 6	7 8	10 0

*Where roof slope is less than 3 in. in 12 in. all side and end laps should be laid in Robertson Cement. Corrugated sheets should not be laid where slope is less than 2 in. in 12 in. Mansard sheets should not be laid on slopes of less than 3 in. in 12 in.

General Advantages—RPM permanently eliminates the need for painting and other maintenance. It is easily erected. It is light in weight and the supporting structural steel framework can be correspondingly lighter. It is adaptable to wide purlin spacings without danger of sagging.

Vibration will not cause it to break or loosen where it is bolted to the framework nor cause it to leak where the sheets are joined. It can be bent or lapped to fit around corners or gables, to fit curved walls or roofs, to fit warped or uneven surfaces.

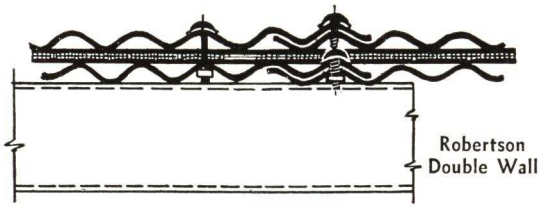
20% Wider Than Commercial Corrugated Sheets—This reduces the number of side laps, thus reducing the percentage of loss in covering capacity.

Flashings and Fasteners—Standard flashings and building trim are furnished in RPM in the same colors as the roofing and siding sheets and in corresponding gauges. Maximum length, 10 ft.

The standard method of fastening RPM is with protected metal straps around the purlins or girts, bolted to the RPM sheets. These patented straps are protected in the same manner as RPM. Bolts are sherardized ¼ in. with mushroom shaped heads. For fastening siding sheets where legs of girts face up, there is a sherardized clip and bolt fastening. For applying RPM on wood, special nails with mushroom heads are used.

Pre-fabricated—All special pieces are cut to fit the plans at our factory and are numbered for ease in erection.

ROBERTSON PROTECTED METAL DOUBLE WALL CONSTRUCTION



Robertson Protected Metal Double Wall Construction consists of two sheets of Robertson Protected Metal with insulating material between. This form of construction is becoming very popular in the construction of roofs and sidewalls.

Advantages—This RPM Double Wall Construction is distinguished by the following advantages: *Lightness of weight*—which effects savings in foundation construction. *Adaptability*—its method of construction is easily adapted to conventional mill construction practice. *Correct thermal insulation*—an impervious construction which gives approximately the same insulating value in wet weather as in dry. RPM Double Wall Construction approximates the insulating value of a 12-in. brick wall. *Economy*—first cost compares favorably with best masonry construction, and maintenance cost is low. *Rapid erection*—work may be carried on in weather unfit for masonry construction and with far greater speed, thus providing for more rapid occupancy. *Salvability*—because of the combination of endurance, corrosion-resistance, light weight, prefabrication, and patented application methods. *Proven performance*—many successful installations have been made and have proved their excellence in actual service.

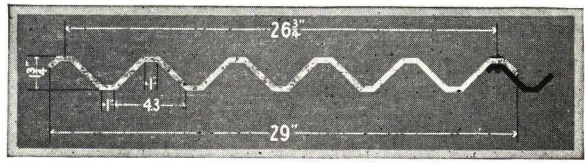
ROBERTSON PROTECTED METAL V-BEAM ROOFS

V-Beam Robertson Protected Metal is a special "deep-corrugation" sheet which represents a great advance in the form and application of corrugated materials. In addition to the corrosion-resistant and maintenance-free characteristics of the standard Robertson Protected Metal, the V-Beam sheet provides a higher degree of strength and resistance to deflection than the ordinary types of corrugation. In effect, the RPM V-Beam sheet provides the structural effect of a series of beams, and because of its extra strength, makes possible important economies in supporting steel work. The deep V-Beam corrugations possess such high drainage efficiency that exceptionally low roof pitches become practical. In addition to its advantages as a self-contained roofing material, the RPM V-Beam sheet also offers great advantages as a corrosion-resistant, maintenance-free deck for flat and built-up insulated roofs.

Dimensions, gauges, weights, coverage, purlin spacings, etc.—See tables on preceding page.

Dead loads—V-Beam, uninsulated, 3 to 5 lbs. per sq. ft.; insulated, 7 to 10 lbs. per sq. ft., depending on gauge used.

Applying Insulation and Built-up Roofing—The usual procedure is followed. Rigid board insulations are recommended. If one layer is used, it is bolted directly to the V-beam sheets. If additional sheets are used, the multiple layers are stapled together or are monolithic and are mopped with asphalt and bolted to the deck as a unit. The upper layer of insulation is mopped with asphalt to receive the first layer of built-up roofing. Successive layers are applied in the usual manner.



LOAD TABLES FOR V-BEAM SHEETS

Based on simple beam conditions, for a *clear span,* and a uniformly distributed load. Loads shown are those at which the steel core sheet has a maximum fibre stress in bending of 16,000 lbs. per sq. in. on the nominal thickness of material. The deflections shown correspond to the loads given for the various gauges and for the particular span.

For a 35-lb. total load (approximately 30-lb. live load) the gauges and spans indicated by bold type *will provide the greatest over-all economy.*

Gauge U. S. Standard	24	22	20	18	Deflection in Inches
Nominal Thickness of Core Sheet	.025	.03125	.0375	.050	
Clear span length	Safe loads—pounds per square foot, uniformly distributed —live load plus dead load.				
4′-0″	115	140	170	260	.15
4′-6″	93	112	135	180	.20
5′-0″	75	93	110	145	.24
5′-6″	62	77	90	120	.29
6′-0″	52	65	77	102	.35
6′-6″	45	55	65	88	.41
7′-0″	**38**	48	57	77	.48
7′-6″	33	42	50	66	.55
8′-0″	29	**36**	43	58	.62
8′-6″	25	32	38	52	.70
9′-0″	23	28	**35**	46	.80
9′-6″	21	25	30	40	.87
10′-0″	.....	23	28	**37**	.96
10′-6″	.....	22	25	34	1.05
11′-0″	.....	.....	23	30	1.15

COPPER COVERED ROBERTSON PROTECTED METAL (RPM)

Copper Covered RPM is an especially attractive addition to the Robertson Protected Metal line. It is long-lived RPM with surface of durable and beautiful Anaconda "Electro-Sheet" copper. This new form of RPM is offered the builder who requires a roofing and siding material possessing distinctive eye-appeal as well as long life. Its cost is only slightly more than that of standard RPM; yet it combines the beauty of copper, the long life of RPM and the strength of steel.

Copper Covered RPM is ideally adapted for erection on industrial buildings, public and commercial buildings, bridges between all types of buildings, canopies for railroad stations, airplane hangars, substations and many other types of modern structures.

The outer surface of Anaconda "Electro-Sheet" copper covers dependable RPM, a product that is backed by over thirty years of outstanding accomplishment in all phases of industry, throughout the world.

Also available are: Aluminum Covered RPM (with aluminum foil surface) and Aluminum Finished RPM (with aluminum painted surface). Ideal for light-reflecting interiors.

THE AMERICAN BRASS COMPANY

Manufacturers of Sheet, Roll and Strip Copper

GENERAL OFFICES

WATERBURY, CONNECTICUT

MANUFACTURING PLANTS

ANSONIA, CONN. BUFFALO, N. Y. TORRINGTON, CONN. DETROIT, MICH. WATERBURY, CONN. KENOSHA, WIS.

OFFICES AND AGENCIES IN PRINCIPAL CITIES

IN CANADA: Anaconda American Brass Limited, NEW TORONTO, ONT.

For Other Pages, see File Index

ANACONDA ECONOMY COPPER ROOFING

Copper roofing, rustless and durable, combines to a degree unrivaled by other materials these important qualifications: it is water-tight, durable in spite of time and weather, relatively light in weight, non-inflammable and safe against flying embers. Snow and ice do not adhere readily to its smooth surface. It is easily installed and, above all, most economical over the years.

ANACONDA
from mine to consumer
REG. U.S. PAT. OFF.

In developing ANACONDA Economy Copper Roofing primarily for residences and similar small roof areas, recognition was accorded to the facts that (1) standing seam construction for sheet metal roofing had been proved both practical and economical; that (2) existing practice resulted in seam spacing too wide for good design in small roofs; and that (3) the cost of the standing seam 16-oz. copper was too high to permit of its widespread use for residential roofing.

Consequently, space between vertical seams was narrowed to 13¾ ins. and the height of the seam reduced to ¾ in. This made possible the use of 10-oz. copper without sacrificing the strength, rigidity and wind resistance obtained from wider, thicker sheets. The use of lighter metal, and its correspondingly greater workability, reduces cost to a point where ANACONDA Economy Copper merits consideration wherever quality roofing is desired.

SAMPLES DISPLAYED WITH ARCHITECTS' SAMPLES CORPORATION NEW YORK, N.Y.

Installation Procedure

Although the principles and practices of standing seam construction are known and approved by the majority of sheet metal men, it has been deemed advisable to prepare and present a series of drawings consolidating the opinions and methods used by recognized experts in the field.

These drawings have been compiled in the form of a book—available to architects upon request. It is the purpose of this book to show each step in the application of a standing seam copper roof without resorting to the use of solder. In general, it may be said that the procedures illustrated are also applicable to 16-oz. copper. Ask for ANACONDA Publication AC7-I.

Readily Available

ANACONDA Economy Copper Roofing is readily available to the trade from stocks maintained by authorized distributors of ANACONDA Sheet Copper in leading cities throughout the country.

Electro-Sheet for Built-Up Roofs

THE AMERICAN BRASS COMPANY also offers copper in thin, wide sheets, under the trade-name "Electro-Sheet" Copper, for use as a membrane between layers of asphalt in built-up flat-deck roofs. Detailed information upon request.

Home with Anaconda Economy Copper Roof in Newton Highlands, Mass.
Built by DAVIS & VAUGHN, Boston

An Anaconda Economy Copper Roof Gracing a Really "Small House"
Built as a model F.H.A. home at Waterbury, Conn.

ANACONDA ECONOMY COPPER ROOFING

SUGGESTED SPECIFICATION

Preparation of Surface

The roof boarding to be laid solid without open joints and shall be thoroughly inspected. All nails to be driven home, and imperfections in the boarding to be repaired.

Felt Lining

Furnish and apply a 15-pound asphalt-saturated lining felt over the entire roof area before applying the copper. This to be done in the usual manner, weather-lapping the edges at least 2 ins., and nailing with flat head copper roofing nails.

Copper

The roofing material to be of ANACONDA 10-ounce Economy Copper Roofing, and shall be supplied in sheets 16 ins. x 72 ins., with parallel edges and square ends.

Method of Construction

The Economy Copper Roofing to be applied according to the installation methods suggested by THE AMERICAN BRASS COMPANY'S booklet "ANACONDA Publication C7-1," or as approved by the architect, following the conventional standing seam system of construction. The seam spacing to be laid out by means of chalk lines on the roof surface, centered so as to give an equal spacing at the ends, and must be approved by the architect before the work is begun.

The roofing to be installed without the use of solder, except in unusual instances where soldering is absolutely necessary to make flashing joints water-tight.

Valleys

The valleys to be [10-oz.] [16-oz.] copper. They shall have ¾-in. edges turned back on each side. The end joints to be made with at least 1-in. seams. They, as well as the joints with the roof pans, are to be single flat locks, *without solder.*

Fastening

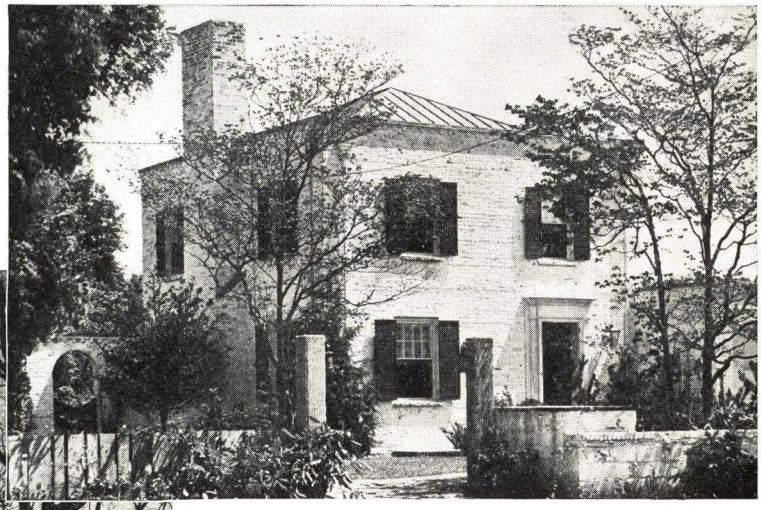
The edging strips to be of lengths not exceeding 8 ft., and to be installed with a 1/16 in. clearance between the strips. The strips to be fastened by solid nailing at intervals of 4 ins. or less. The roof pans, valleys, etc., to be fastened by means of 1¼ ins. x 2¾ ins. 10-oz. copper cleats spaced not over 12 ins. apart along each edge or seam, using two nails to each cleat, the end of the cleat folded over to cover the nail heads.

Nails

For all fastenings of copper, ⅞-in. No. 12 flat head copper roofing nails to be used.

Miscellaneous

In general, the seams are to be rolled or locked in the right-hand direction, but at the valleys all seams are to be rolled in the same direction as the flow of water.



Below: **Home in Marblehead, Mass.**
DONALD C. GOSS, Architect
Copper was used extensively throughout this house

Above:
The 1936 "Good Housekeeping" House at Wychwood, Westfield, N. J.
DWIGHT JAMES BAUM, Riverdale-on-Hudson, N. Y., Architect

Hundreds of installations in all sections of the country have shown the adaptability of Anaconda Economy Copper Roofing to many different styles of architecture.

MEMORANDA

AMERICAN ZINC INSTITUTE, INC.

"Seal of Quality" Heavy Coated Galvanized Sheets for Roofing and Siding

60 East 42nd Street
NEW YORK, N. Y.

Product

SEAL OF QUALITY HEAVY-COATED GALVANIZED SHEETS are a specially manufactured product designed to meet the demand for a more durable roofing and siding material.

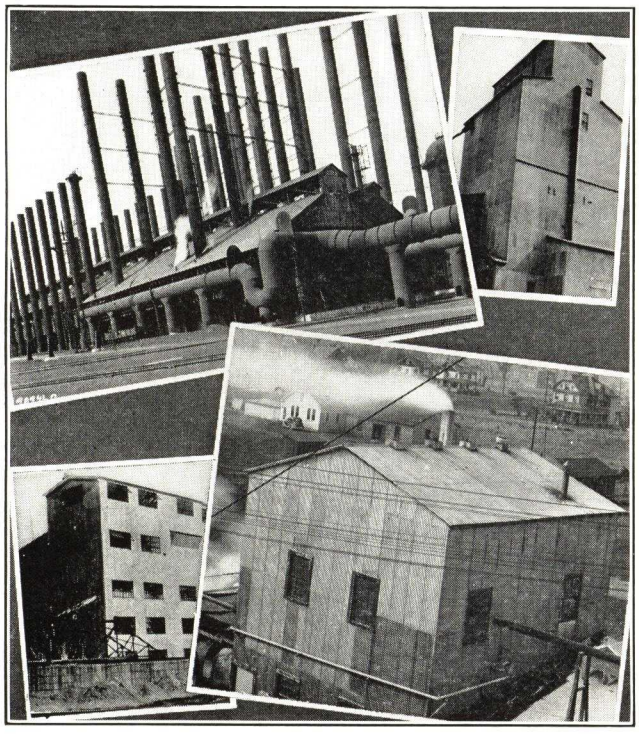
The zinc coating on SEAL OF QUALITY SHEETS is extra heavy, fully two ounces per square foot. Because of this thick rust-preventive protection, SEAL OF QUALITY SHEETS can be depended upon to give long extra years of rust-free service at a minimum "per year" cost.

Need of Heavy Zinc Coating

Increased durability of galvanized sheets makes possible substantial savings in upkeep and replacement costs.

Various base-metals are used in such sheets, including Bessemer and open-hearth steel, copper-bearing steel, pure iron, wrought iron, copper-bearing iron, etc. All of these will *begin to rust as soon as exposed to the atmosphere*—the rate of corrosion, or rusting, varying for the different types, as shown in numerous tests which have been made upon the uncoated or "black" sheets.

To *prevent rust,* these sheets are coated with zinc, which, as stated in U. S. Bureau of Standards Circular No. 80, is "by far the best" protective metallic coating for the rust-proofing of iron and steel. Zinc, being electro-negative to iron and steel, exerts "galvanic" protection against corrosion of the base-metal, even where the latter is exposed over a small area, as for instance by a scratch in the coating. Most other non-ferrous metals used in coating iron and steel tend to accelerate or increase rusting under such conditions instead of inhibiting it.



"Seal of Quality" Heavy-coated Galvanized Sheets for roofing and siding will reduce maintenance costs on all types of industrial structures

When zinc-coated or "galvanized" sheets are exposed to the elements, *the time elapsing before the appearance of unsightly and destructive red rust depends not upon the nature of the base-metal, but upon the weight or thickness of the zinc coating.* The heavier the coating the longer the service life; in fact, except in severe industrial atmospheres, heavier coatings have been shown to give much more than a proportionate increase in life.

SEAL OF QUALITY HEAVY-COATED SHEETS are specially made by licensed manufacturers and carry an extra-heavy zinc coating—two ounces per square foot. Their high standard is maintained by rigid tests and inspections, which are checked by the engineers of the AMERICAN ZINC INSTITUTE, INC. Both the "SEAL OF QUALITY" brand and the trade-mark or name of the manufacturer appear on *every* sheet, thus giving double assurance of quality.

The small additional cost of SEAL OF QUALITY HEAVY-COATED SHEETS is much more than offset by their increased life.

Sizes and Styles

Available in No. 28 gauge and heavier, in all standard widths and lengths.

Sold mainly as formed roofing and siding, particularly in the 2½-in. and 1¼-in. corrugated styles. Corrugated sheets are the strongest form of sheet metal known, and are not appreciably affected by expansion and contraction. Also sold in V-crimped styles by certain manufacturers.

SEAL OF QUALITY HEAVY-COATED SHEETS are not suitable for more severe forming operations unless special measures are taken to prevent damage to the heavy zinc coating.

Licensed Manufacturers

Apollo Steel Company, Apollo, Pa.
Bethlehem Steel Company, Bethlehem, Pa.
Carnegie-Illinois Steel Corporation (Subsidiary of U. S. Steel Corporation), Pittsburgh, Pa.
Columbia Steel Company (Subsidiary of U. S. Steel Corporation), San Francisco, Cal.
Continental Steel Corporation, Kokomo, Ind.
Granite City Steel Company, Granite City, Ill.
Inland Steel Company, Chicago, Ill.
The Newport Rolling Mill Company, Newport, Ky.
Reeves Steel & Manufacturing Company, Dover, Ohio
Republic Steel Corporation, Cleveland, Ohio
and Gulfsteel Division, Birmingham, Ala.
Tennessee Coal, Iron & Railroad Company (Subsidiary of U. S. Steel Corporation), Birmingham, Ala.
Weirton Steel Company, Weirton, W. Va.
Wheeling Corrugating Company, Wheeling, W. Va.
Wheeling Steel Corporation, Wheeling, W. Va.
The Youngstown Sheet and Tube Company, Youngstown, Ohio

American Zinc Institute Service

Additional information concerning SEAL OF QUALITY HEAVY-COATED GALVANIZED SHEETS gladly furnished on request.

The services of the AMERICAN ZINC INSTITUTE, INC. are available without charge to anyone interested in the utilization or application of zinc or zinc products.

BERGER BROTHERS COMPANY

Gutter Hangers and Conductor Pipe Fasteners

229-237 Arch Street
PHILADELPHIA, PA.

Products

GUTTER HANGERS and CONDUCTOR PIPE FASTENERS, of malleable iron, wrought iron, cast "tuf-bronze" and copper channel.

Also a general line of Sheet Metal Workers' Requirements; Quaker City Conductor Pipe and Quaker City Eaves Trough; "Quaker City" lines of Mitres, Ends, Caps and Outlets.

Manufacturers of Octagon and Polygon Conductor Pipe; "Rival" Eaves Trough Strap Hanger.

TRADE
-B B-
MARK

Our registered trade-mark appears on all products manufactured by us. This mark represents dependability, durability and strength and protects the purchaser against inferior imitations.

When specifying, full protection is assured by insisting that our trade-mark appear on every piece.

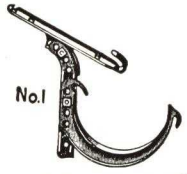
The Mark of Quality Which Protects the Purchaser

We are the originators, designers and manufacturers of, we believe, the best grade of gutter hangers and conductor pipe fasteners on the market.

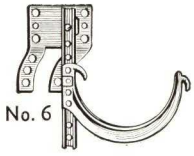
How Furnished—Made of malleable and wrought iron, plain or tinned (plain furnished unless otherwise specified), cast "tuf-bronze" and copper channel. All shanks and circles interchangeable. One bolt included with each hinged shank. Hinged shanks are adjustable to any pitch of roof. Shanks may be lengthened with our extension shanks.

Free samples on request.

B. B. Gutter Hangers

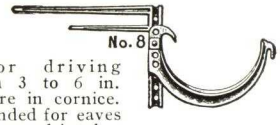


Clamped direct to metal roof, requiring only one bolt through the iron. Especially suitable for awnings and corrugated roofs

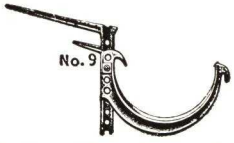


For nailing against O. G. mouldings. The two stays are made to fit in the cove and can be bent to suit variation

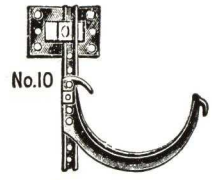
For driving from 3 to 4 in. square in cornice. Lower prong forms a brace for the upper and makes it strong and firm



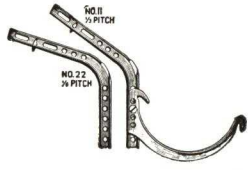
For driving from 3 to 6 in. square in cornice. Intended for eaves where shingles project over the cornice



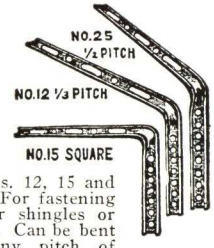
For driving with pitch of roof. Suitable for narrow moulded cornice



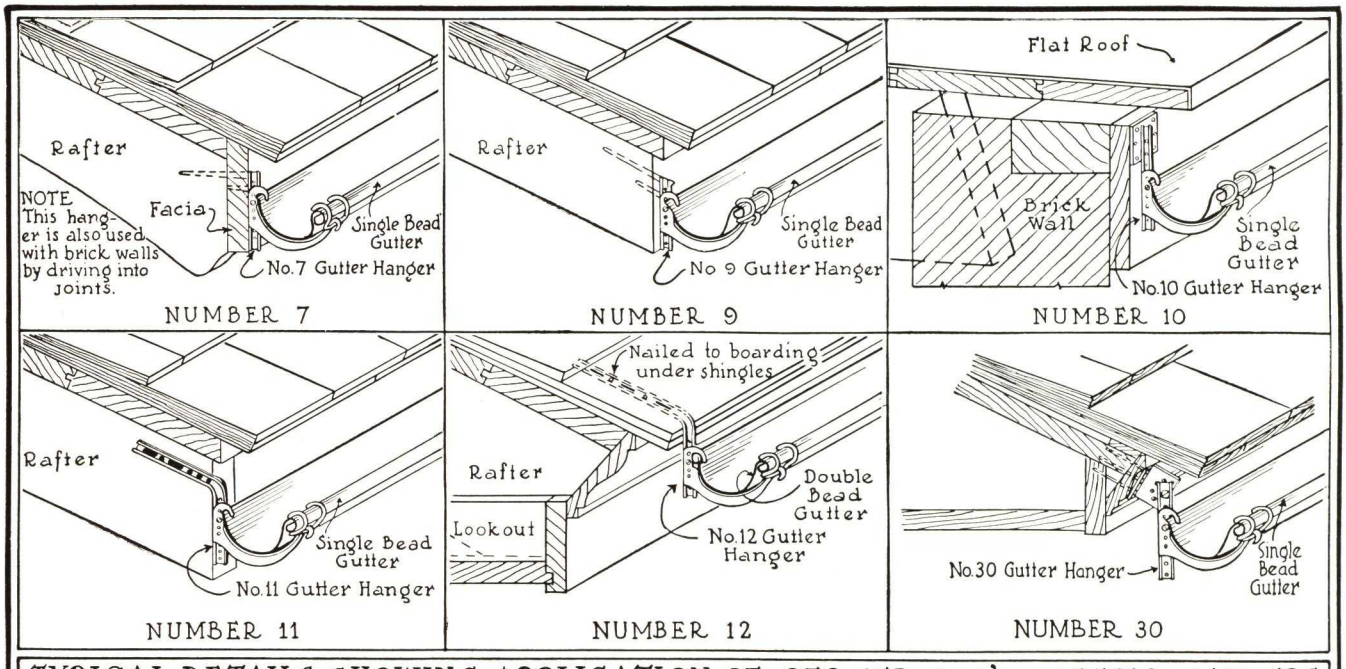
For nailing against square box cornice



For nailing against side rafters



Nos. 12, 15 and 25. For fastening under shingles or slate. Can be bent to any pitch of roof without weakening or breaking

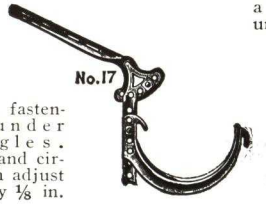


TYPICAL DETAILS SHOWING APPLICATION OF BERGER BRO'S. GUTTER HANGERS

B. B. Gutter Hangers

Made of malleable and wrought iron, plain or tinned (plain furnished unless otherwise specified), solid cast bronze and copper channel. All shanks and circles interchangeable. One bolt included with each hinged shank. Hinged shanks are adjustable to any pitch of roof. Shanks may be lengthened with our extension shanks. Free samples on request.

For fastening under shingles.



For fastening under shingles. Hinge and circle both adjust to every ⅛ in.

For nailing or screwing to shaped mouldings at any angle desired. Hinged for any pitch of roof

Right:

No. 30 Utility Shank

Twelve different and distinct adjustments. Takes the place of Nos. 1, 5, 6 and 20 shanks and in many instances No. 10. For use with all types of O. G. moulding. Roof overhang does not interfere with nailing due to proper angle of plate. Circle adjustment permitted full length of shank stem. Invaluable for use as a brace where shanks are subject to unusual strain

Gem Gutter Circle

For single bead gutters. Sizes, 3½, 3¾, 4, 4½, 5, 6, 7 and 8 in.

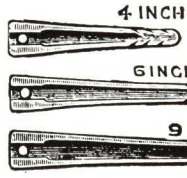
Penn Gutter Circle

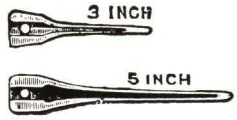
For double bead gutters. Sizes, 3½, 4, 4½, 5, 6, 7 and 8 in.

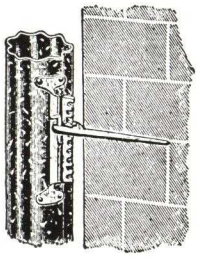
Circles are applicable to any B. B. hanger

Clasp Pipe Hooks

For fastening conductor pipe to wood, brick or stone any distance from wall. Length drives: 3 and 5 in. for wood; 4, 6 and 9 in. for brick and stone.







B. B. Conductor Pipe Fasteners

For fastening all kinds of conductor pipes any distance from wall. Used in any position and allow enough variation to let pipe slip together until tight in the joints. Needs no close measuring on wall to find a joint for the drive.

Plain Sickle Pipe Hooks

With wood and brick drive. Sizes, 2, 3, 4, 5 and 6 in.

Corrugated Sickle Pipe Hooks

With wood and brick drive. Sizes, 2, 3 and 4 in.

Round Corrugated Hinged Pipe Hook

With wood and brick drive. Sizes, 2, 3, 4, 5 and 6 in.

Plain Round Hinged Pipe Hook

With brick drive in 2, 3, and 4 in., and wood drive in 2, 3 and 4-in. sizes.

Left:

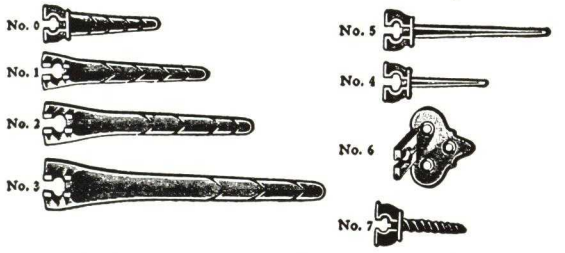
Square Wired Pipe Hook

With wood and brick drive. Sizes, 3, 4, 5 and 6 in.

Right:

Round Wired Pipe Hook

With wood drive. Sizes, 3 and 4 in.

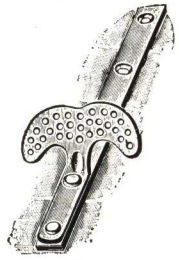


No. 0, for brick, 3 in.
No. 1, for brick or stone, 4½ in.
No. 2, for stone, 6 in.
No. 3, for stone, 9 in.

No. 4, for wood, 3 in.
No. 5, for wood, 5 in.
No. 6, to nail on wood
No. 7, to screw in wood

Standing-Seam Roof Snow Irons

Designed to dispense with snow rails or gutters formed on the roof to prevent snow sliding. Clamp fast to roof by clinching lugs through the standing seam. Made of the best malleable iron.

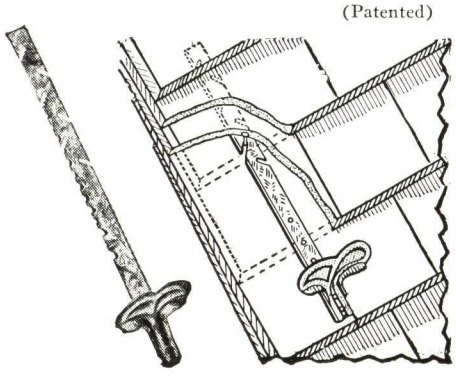


Slate Roof Snow Iron

No. 2 is riveted on ⅛ x 1 in. iron plates, 12 in. long, to go 8 in. under the slate. It is very ornamental on a roof and must be seen to be fully appreciated.

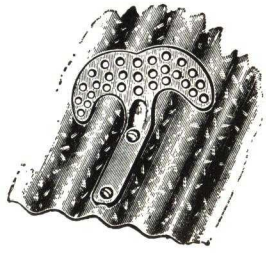
No. 100 Snow Guard

(Patented)



Designed especially for old roofs, No. 100 has eliminated necessity of removing slate, with possibility of breakage, in order to apply it. Insert slotted plate under slate or shingle; engage a nail with the convenient, scientifically placed slots and draw downward to secure full benefit of the slot. At base of guard there are two sharp points which tend to keep guard in alignment. Five to ten of these guards can be installed in the time it takes to install one of the old style.

Made of heavy stamped steel, hot galvanized after forming, and stamped copper, its deep flanges and embossments give it maximum strength.



Corrugated Roof Snow Irons

No. 20 iron for corrugated roofing fits either 1¼ or 2½ in. corrugation. It is applied either by riveting to roof or by nailing through the roof to sheathing. It fits on top of the corrugation, as illustrated, and will not leak.

CHASE BRASS & COPPER CO.

—INCORPORATED—

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

WATERBURY, CONN.

CHASE WAREHOUSES

BALTIMORE, MD.
BOSTON, MASS.
CHICAGO, ILL.
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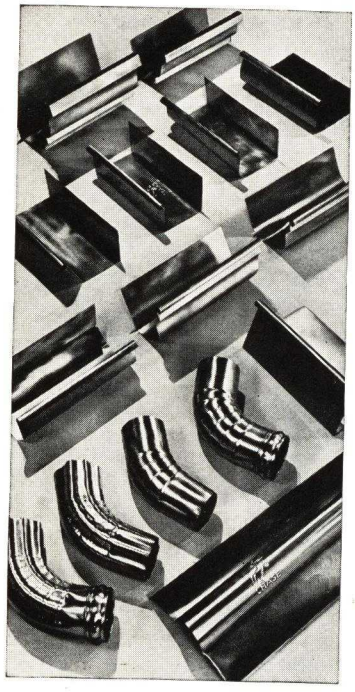
DETROIT, MICH.
HOUSTON, TEX.
LOS ANGELES, CAL.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NEW ORLEANS, LA.
NEW YORK, N. Y.
NEWARK, N. J.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PROVIDENCE, R. I.
ST. LOUIS, MO.
SAN FRANCISCO, CAL.
SEATTLE, WASH.

For Other Chase Pages, see File Index

CHASE COPPER ROOFING MATERIALS



CHASE

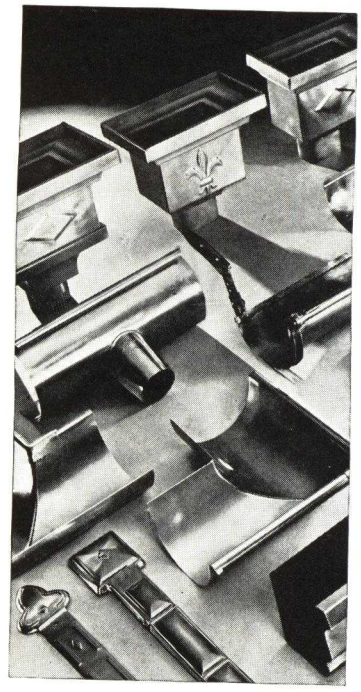
Thickness of Copper for Exposed Work

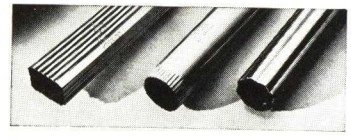
For exposed sheet metal work, 16 oz. to the square foot is the lightest weight copper that will give satisfactory service. Based on this premise which has been carefully checked by eminent authorities over long periods of time and under varying conditions of actual service, Chase Copper downspouts, gutters, downspout heads, elbows and shoes are made of 16-oz. copper sheet. Heavier weights can be furnished to special order but we do not advocate nor make anything *lighter* than 16 oz.

As our guarantee of full weight and also to make it easy for architects to check the materials of a completed installation, we indelibly die-stamp every length of our downspouts and gutters, "Chase 16 Oz. Copper."

Stock Downspouts

There are three types and five sizes of Chase Copper Downspouts available for immediate shipment from our warehouse stocks: plain round, corrugated round and corrugated square. All of these types, except corrugated square which runs only to 5 in., are carried in 2, 3, 4, 5 and 6-in. diameters, in 10-ft. exact lengths.





Stock Gutters

(1) Single bead, lap joint, half-round gutters in 16 oz., 10-ft. lengths, and in 4, 5, and 6-in. diameters.

(2) Type K box gutter in 10 and 12-in. girth.

Double bead and slip joint types, also "OG" and other special patterns can be furnished promptly to order.

Chase Copper Accessories

Copper elbows, shoes, gutter miters, end caps, wire strainers, downspout straps, gutter hangers, ridge roll, flashings, snow guards, nails, etc., are also carried in our warehouse stocks ready for immediate shipment.

Lead Coated Sheets and Accessories

All Chase Copper Roofing Materials and Sheet Copper can be furnished lead coated. This is particularly desirable when a neutral gray coloring is required.

Stock Downspout Heads

Where strict economy must be practiced, any of the following stock patterns of Chase Copper Downspout Heads are acceptable for the average building. Quantity production permits very reasonable prices on these stock patterns, all of which are available for immediate shipment from our warehouse stocks.

All of the heads listed below are available with either round or square outlets. Any of these stock patterns can also be supplied lead coated within a few days.

Order No.	Pattern	Dimensions, in.			
		Outlet	Face	Depth	Height
1A	Large diamond	2x3	10	6	9
1B	Large diamond	3x4	11	6½	9
2A	Small diamond	2x3	9	5½	7½
2B	Small diamond	3x4	10	6	7½
3A	Fleur-de-lis	2x3	9	5½	7½
3B	Fleur-de-lis	3x4	10	6	7½

LEDKOTE PRODUCTS COMPANY

Manufacturers of Cast-Lead and Lead-Coated Sheet Copper Products

INCLUDING ALL LEAD WORK FORMERLY MADE BY HENRY HOPE & SONS, INC.

35-01 Vernon Boulevard
LONG ISLAND CITY, NEW YORK

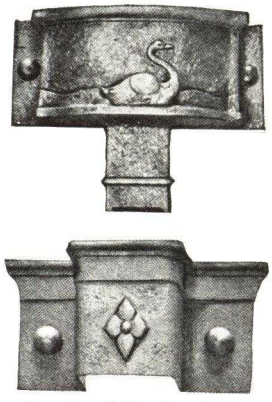
128 Spring Street
EVERETT, MASS.

PRODUCTS

Cast Lead Leader Heads	Ledkote Plain Gutters	Ledkote Sheet Valleys
Cast Lead Leader Straps	Ledkote Plain Leaders	Ledkote Sheet Flashings
Ledkote Ornamental Gutters	Re-Expan Leaders	Ledkote Sheet Roofings
Ledkote Ornamental Leaders	Re-Expan Leader Heads	Ledkote Sheet Gutter Linings

Cast Lead and Lead Coated Products formerly made by HENRY HOPE & SONS, INC.

LEDKOTE CAST-LEAD LEADER HEADS AND STRAPS



Cast Lead Head and Strap

Design

Cast lead is the preferable material to use for leader heads and straps. When they are made of this material they have a decided appearance of solidity and do not show mitered joints, solder marks and the raw edges such as are found when leader heads and straps are made of thin metals.

Any of these leader heads can be supplied with round, rectangular, or square outlets of size to fit leader. Straps are always made to conform in size and scale with the dimensions of leader specified.

Ledkote cast-lead leader heads and straps are securely fastened to masonry construction by means of lead expansion plugs and lead-headed nails. In frame construction lead-coated bronze lag screws are used. These fastening devices are furnished with each order at no extra charge.

The LEDKOTE PRODUCTS COMPANY has in stock a great many styles and types of designs. Catalog on request.

Specification Data

Leaders heads shall be Ledkote Cast-Lead Leader Head No.

Leaders shall be Ledkote Leader No.— and shall be 16-oz. cold rolled copper Ledkote-Tagged 50 U. T. securely fastened to the walls as per manufacturer's directions.

Gutters shall be Ledkote Gutter No.— and shall be 16-oz. cold rolled copper Ledkote-Tagged 50 U. T. All material to be furnished by LEDKOTE PRODUCTS COMPANY and each piece shall bear the Ledkote Blue Tag when delivered at the building site.

Combination Set

LEAD-COATED COPPER

Lead-coated sheet copper is being universally specified by architects because they are fully informed relative to the ravages of water laden atmosphere as well as acid laden air on plain copper. Lead coating also assures protection against copper staining of the building, and it blends beautifully with exterior wall finishes and roofing. You seek—*Permanence* also—*Tone and Texture.*

The surface of the copper is uniformly coated, and the lead is thoroughly integrated with the copper by the hot dip process, forming a perfect and permanent bond. The life of the product is only obtained by the amount of lead coating applied. A definite and given quantity of lead *must* be applied.

By the simple process of *tagging* every piece of lead coated sheet copper you are assured that the weight of copper, as well as the desired and proper and most essential of all, amount of lead coating has been applied.

Ledkote-Tagged lead-coated products provide that highly desirable imperishable quality. It assures even tone and textures. When assembled it matches—piece for piece.

Ledkote-Tagged lead-coated products possess a surface superior in merit because the surface is entirley free of copper spots and white acid blotches. Ledkote-Tagged is *really* lead coated.

LEDKOTE
25-30 U. T.

For Flat Work

Every Piece of Ledkote Is Tagged—
Look for The Blue Tag.

LEDKOTE
50 U. T.

For Leaders and Gutters

Specifications for Lead Coated Copper

Flat Work—All valleys, flashings, gutter linings and roof coverings where indicated shall be 16-oz. Ledkote-Tagged 25-30 U. T.

Each piece shall bear the Ledkote blue tag when delivered at the building site.

Formed Work—All gutter, leaders, leader heads (or Cast Lead Leader Heads No. .. and straps) where indicated shall be of sizes shown and shall be 16-oz. Ledkote-Tagged 50 U. T. Each piece shall bear the Ledkote blue tag when delivered at the building site.

Prices are now from 40% to 60% of their former level on Cast-Lead and Lead-Coated Copper Products.

LYON, CONKLIN & CO., INC.

ESTABLISHED 1860

Manufacturers and Distributors of Lyonore Metal Products

MAIN OFFICE AND PLANT

McComas Street at Hanover Street Viaduct
BALTIMORE, MD.

BRANCH OFFICE: 930-932 E Street, N. W., WASHINGTON, D. C.

Products

GALVANIZED SHEETS, BLACK SHEETS, CORRUGATED and FORMED ROOFING SHEETS, GALVANIZED ROLLED ROOFING, "LYON BRAND" 40-LB. COATED ROOFING TIN, CONDUCTOR PIPE, EAVES TROUGH and ELBOWS and AIR CONDITIONING SUPPLIES.

United States Supreme Court Building

Lyonore Metal specified and used for this magnificent structure's air conditioning system

Why You Should Specify Lyonore Metal Chromium-Nickel-Copper-Iron Alloy Products

Lyonore Metal is iron alloyed with chromium and nickel, with a small amount of copper. It is made according to a formula which provides in a commercially practical sheet metal, remarkably high resistance to corrosion. Its principal elements, chromium and nickel, have long been known by metallurgical science to be able to withstand longer than any other semi-precious metals the destructive attacks of time and weather. In the manufacture of Lyonore Metal, its elements are so proportionately and homogeneously combined that they are not unduly influenced by electrolysis. Lyonore Metal, Chromium-Nickel-Copper-Iron Alloy is exceptionally long-lived—and, figured over any period of years, costs much less to install than other sheet metals of similar character.

Uses

Lyonore Metal has been specified and used by architects and engineers for all sheet metal work—air conditioning and ventilating ducts, dust collector systems, smokestacks and breechings, flashing, roofing, elevator shaft linings, metal buildings, etc.—in many of the finest office and public buildings, hotels, hospitals and schools along the Atlantic Seaboard. It is used for countless industrial purposes such as canopies, vat linings, air conditioning systems, factory roofing and siding, etc. Galvanized Lyonore Metal and Lyonore Metal base terne plate are widely used for roofing conductor pipe, eaves, trough, flashing, etc., on private dwellings of every description. Lyonore Metal is generally adaptable to any sheet requirement.

Identification

TRADE MARK
LyonoreMetal
an alloy
CHROMIUM NICKELM
Warranted
Lyon, Conklin & Co. Inc.
BALTIMORE --- WASHINGTON
ESTABLISHED 1860

For positive identification, each sheet of galvanized Lyonore Metal is stenciled with the accompanying trade mark in red three times diagonally lengthwise. Each length of pipe, gutter and fittings is die-stamped "Lyonore Metal" and gauge.

Sizes

Lyonore Metal Galvanized Flat Sheets are available in all standard widths, lengths and gauges. For ventilating ducts and dust collector systems, the following table of sizes and gauges is recommended:

16-in. diameter and smaller	No. 26 gauge
17 to 30-in. diameter	No. 24 gauge
31 to 40-in. diameter	No. 22 gauge
41 to 60-in. diameter	No. 20 gauge
61-in. and over diameter	No. 18 gauge

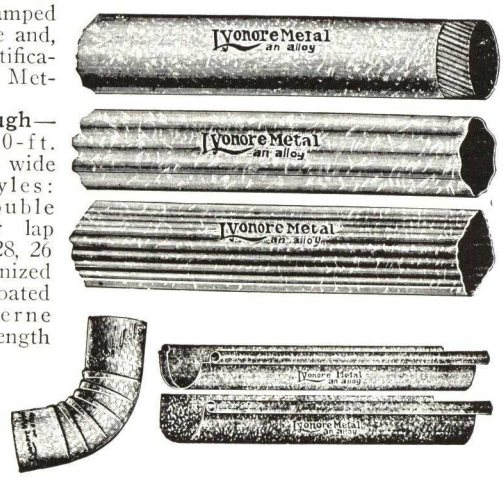
Lyonore Metal Corrugated Sheets are furnished in all standard gauges and lengths from 5 to 12 ft.; standard corrugations are ⅜, 1¼, 2, 2½, 3 and 5 in.—although 1¼ and 2½ in. are usually specified—covering width is 24 in.

Galvanized Lyonore Metal is also available in Pressed Standing Seam, V-Crimped, Weatherboard Siding, Beaded Ceiling, Brick and Stone Siding, etc.

Lyonore Metal Conductor Pipe and Eaves Trough

Conductor Pipe—Made in 10-ft. lengths in six styles: Plain round and square, corrugated round and square, crimped round and square. Ends are deeply crimped to slip easily into place and to bind snugly and tightly when fitted. Furnished in gauges 28, 26, and 24 galvanized and in 40-lb. coated 26-gauge terne plate — each length die-stamped with the gauge and, for quick identification, "Lyonore Metal, an alloy."

Eaves Trough—Made in 10-ft. lengths in a wide variety of styles: Single or double bead—slip or lap joint—gauges 28, 26 and 24 galvanized and in 40-lb. coated 26-gauge terne plate — each length plainly die-stamped with the gauge and "Lyonore Metal, an alloy."



For conductor pipes, hanging gutters, eaves trough	No. 26 gauge
For cornices and skylights	No. 24 gauge
For gravel strips and flashings	No. 26 gauge

Lyonore Metal Base Roofing Terne Plate

"Lyon Brand" has a Lyonore Metal base—carefully selected, perfect sheets—carrying a 40-lb. coating of new tin and new lead—coated by the pure palm oil process. In specifying "Lyon Brand" Tin Roofing, the following is recommended:

TRADE MARK REG. U.S. PAT. OFF.
IC BASE
LYON BRAND
BALTIMORE
40LBS CTG
RE-DIPPED
LYONORE METAL BASE
LYON, CONKLIN & CO. INC.

All roofing—IC thickness; valleys and gutters—IX thickness.

Long ternes for valleys, wall capping, skylights, secret gutters, pipes, etc.—26 gauge.

For further information, write for Architects' AIA File No. 12-A-31

Revere 6

COPPER

Roofing & Flashings

REVERE

PROVIDES

dependable copper and copper alloy products for building construction and maintenance, and . . .

OFFERS

competent technical assistance in the selection and application of these materials to all building requirements.

FOUNDED BY PAUL REVERE

1 8 0 1

REVERE BUILDING PRODUCTS

Sheet Copper and Leadtex (lead-coated copper) . . .

for roofing, gutters, conductor pipes, flashings, skylights, spandrels, decorative applications and termite proofing, also for range boilers.

Cheney and Revere Thru-Wall Flashing . . .

for protecting buildings against seepage, leaks and efflorescence.

Copper Water Tube, Brass Pipe, Red-Brass Pipe and Copper Pipe (S.P.S.) . . .

for water supply, hot and cold water lines, heating lines, drainage lines, oil burner, air conditioning and refrigerant lines, lawn irrigation and industrial piping.

Herculoy

for range boilers and hot water storage tanks, chemical containers and unfired pressure vessels.

Extruded Shapes of Architectural Bronze, Aluminum and Nickel-Silver, also Panel Sheets . . .

for the construction of doors, windows, grilles, store fronts, screens, pilasters and the like; Panel sheets of architectural bronze and other alloys for use with extruded shapes in the construction of the above.

Round, Square and Special Shaped Tubes in various alloys . . .

for door stiles and grilles in color match with Architectural Bronze Extruded Shapes and Panel Sheets.

Revere products can be safely written into any specification with assurance of quality and prompt delivery from Revere's Mills or through Revere's Distributors. Further information on any Revere Products supplied on request to any of the offices listed on rear cover.

COPPER ROOFING

COPPER IN BUILDINGS

The value of copper in construction of durable and beautiful buildings has been recognized by building authorities for many centuries. More than 600 years ago the Hildesheim Cathedral, roofed with copper, was erected in Germany, and stands today a monument to the enduring qualities of copper. In this country the copper roof of Christ Church, Philadelphia, Pa., constructed in 1737, is entering its third century of service, still in good condition. In 1801, Paul Revere, famous revolutionary patriot, established America's first copper rolling mill at Canton, Massachusetts. This enterprise, operated under the name of Revere & Son, was the lineal ancestor of Revere Copper and Brass Incorporated, which is America's largest producer of sheet copper. Revere's facilities, as modern as science can devise, include the first continuous copper rolling mill in this country. Early Revere copper was used to roof the dome of the Old Massachusetts State House in Boston, to resheathe the American frigate, "Old Ironsides," and for the roof of New York's City Hall. Since then, buildings of all types from cottages to skyscrapers have been protected by Revere Copper.

REVERE SERVICE TO ARCHITECTS

Revere Copper and Brass Incorporated is prepared to cooperate with architects in selection and application of sheet copper for roofing, flashing, gutters, etc. Architects wishing to take advantage of the durability of sheet copper can obtain technical advice on practical problems of application, selection of weights; and means of ensuring the realization of plans through proper specifications. Others, appreciating artistic possibilities of copper for ornamental construction, are offered help with their designing problems. Inquiries may be addressed to Sales Offices listed on the rear cover.

PRODUCTS AND DISTRIBUTION

Products for the roofing industry available through Revere and Revere distributors include: Sheet Copper in all useable types, such as plain copper in soft and hard tempers, Leadtex (lead-coated copper), nickel and chromium plated copper, tinned copper, trimped copper, etc.; Parallel Edge strip copper for the mnaufacture of gutters, leaders, etc., Cheney Flashing, Cheney system of Spandrel Water Proofing, Revere Thru-Wall Flashing.

Revere operates modern mills in Rome, N. Y.; Baltimore, Md.; Detroit, Mich.; New Bedford, Mass.; Taunton, Mass. and Chicago, Ill.

Shipment from these widely separated points to Revere's distributors, and continuous maintenance of large stocks of sheet copper in all commercial forms by these distributors in important trading centers throughout the country assure prompt and adequate service to architects, contractors and fabricators.

ADVANTAGES OF SHEET COPPER ROOFS

DURABILITY Copper is one of the least chemically active of ordinarily used commercial metals. This gives it high resistance to corrosion from air, water, and acid solutions. It is rust-proof, and therein lies the key to the lasting qualities of a copper roof. If properly applied it affords insurance against costly repairs to building interiors as well as maintenance expense on the roof itself.

The need for durability is especially important in flashings, gutters, and downspouts. Flashings are intended to insure against leakage at critical localities. Gutters and downspouts undergo severe service, and copper stands the strain better than rustable metal. Moreover, copper is fireproof. As its electrical conductivity is high, a copper roof, properly grounded, provides the best possible protection against lightning.

ECONOMICAL The first cost of copper is its only cost, if properly applied. Initially, it will be slightly more expensive than rustable metal, but such slight excess will be trifling when compared with the total cost of the building. The long-run economy to be obtained by the use of copper for roofing, flashings, gutters, downspouts and other sheet metal uses accrues through freedom from charges for maintenance or replacement frequently accompanied by the necessity for costly scaffolding.

ATTRACTIVE Nature acts as the decorator of copper. In time she forms an attractive green coating known as "patina" which enhances the beauty of the structure and acts as a shield against deterioration. Lead-coated copper may be used for grey tones, if preferred to the green patina mentioned above.

The roof is more than a mere cover for the building. It gives dignity, character and beauty; and the design and color are important to harmony.

EASY TO APPLY Copper is one of the mose ductile of metals. This permits of easy working, and helps make it an ideal metal for roofing sheets. Through this inherent quality it can be moulded without difficulty to the contour of domes or cornices, as well as bent to form locks or valleys.

LIGHT IN WEIGHT Copper's corrosion resistance makes it possible to use a thin sheet so it becomes one of the lightest of roofs, thus eliminating heavy suppornig structures. The weight of 100 square feet of 16 ounce copper roofing is from 120 to 140 pounds compared with 1000-2000 pounds for Clay Shingle Tile, 500-1600 pounds for Slate, 530-715 pounds for Felt and Gravel, and 200-300 pounds for Wood Shingles.

THE ALL-COPPER ROOF

The ideal roof is all copper. Such a roof, properly installed, will last as long or longer than the building on which it is used. It assures minimum servicing and upkeep expense, is permanently water-tight and weather-tight, and efficiently protects the insulation beneath. It possesses intrinsic beauty that is enhanced with age, when it takes on a natural protective bluish-green patina that is greatly admired. The initial cost of an all-copper roof is slightly more than for most other types, but this additional cost is warranted when these qualities are taken into account.

However, where the preference of the home owner or style of arhcitecture dictates roofs of other materials—such as slate, shingles, or composition shingles, clay or cement tile—Revere Sheet Copper also plays an important part.

Flashings, valleys, ridges, cornices, gutters, eaves troughs and conductor pipes should be constructed of Revere Sheet Copper to insure maximum protection against weather.

ROOF DESIGNS

Roofs may be flat, pitched, or made up of a combination of slopes. Principal types are: (1) The ridge or gable roof. (2) The hip roof. (3) The gambrel roof. (4) The mansard roof. (5) The flat roof.

Copper can be used for all of these types of roofs. Its application follows five standard methods. These are: (1) Standing Seam. (2) Batten or Ribbed Seam. (3) Flat Seam. (4) Corrugated Copper Roofing. (5) Copper Shingles and Tiles. The first three of these will be discussed in detail in the following pages. The slope or slopes of a roof, with climatic and drainage considerations, will largely determine which method should be employed. In general, the flat seam method is used for flat roofs and decks, and for domes and cupolas; the standing and batten seam methods, for sloping roofs.

STANDING SEAM ROOFING

In standing seam roofing the sheets are joined along their long sides with seams left standing about an inch. These seams break up the roof area, avoiding the monotony of a continuous large expanse and give an attractive ribbed appearance, although less marked than in the batten type. In general, standing seam roofing is applicable to the same type of structures as the batten type, and can be used on smaller buildings more artistically. See details page 5.

FLAT SEAM ROOFING

Flat seam roofing is used most commonly on flat decks or flat roof areas, but is adaptable to all slopes. It can be used on slopes of ¼″ per foot and greater. Many very steep roofs, conical spires, towers, domes, and other curved surfaces are covered with flat seam roofing. It is necessary only that the roof and gutter have sufficient slope to shed the water. On curved surfaces the copper sheets are patterned in various shapes and sizes, and in all flat seam work large sheets should be avoided.

Small sheets, with ½″ seams, flat-locked and soldered, are used for flat roofs and decks. The size recommended is 14″ x 20″. These sheets with edges already tinned for soldering are stocked by some distributors and are available on order from Revere Mills through all Revere distributors. If there is no possibility of water collecting on the roof, because of clogged outlets, or ice and snow, the seams can be left unsoldered and filled with white lead. This construction is seldom used except on domes and steeples and when used the sheets need not be tinned. For details see page 8.

BATTEN OR RIBBED SEAM ROOFING

In this type of roofing the surface is broken up by evenly spaced battens or ribs laid parallel and running with the slope of the roof. The roof covering is made of soft (roofing temper) copper sheets formed between battens, and caps over the battens locking into the sheets. This construction safely provides for lateral expansion and contraction, if due consideration is given at time of laying to local temperature ranges.

The artistic effect of these ribs makes the batten seam excellent for large roof areas of public buildings, churches, cathedrals and large residences as it provides dignity and ornamentation. This type can be used on slopes of 3″ to the foot or more. It always should be borne in mind that the longitudinal seams at the battens are unsoldered and, therefore, not water-tight. It is not always safe accordingly to use the batten method on slopes as low as 3″ to the foot in localities where quantities of ice and snow may collect and at melting cause water to back up over the battens. Such special local conditions must be considered when roofs are designed. For details see page 11.

STANDING SEAM COPPER ROOF

Standing seam construction is strongly recommended as the best way to apply copper as a roofing material wherever conditions permit. The sheets are joined along their long sides, with seams left standing. This construction gives an attractive appearance and, being unsoldered, allows for expansion and contraction. Most of the centuries-old roofs throughout the world are of this type, in which use of solder is at a minimum.

These seams break up the roof area, avoiding the monotony of a continuous large expanse and give an attractive ribbed appearance, although less marked than in the batten type.

Standing seam roofing is suitable for buildings of all types having a roof slope of 2½" or more per foot. It lends itself to more artistic use on small buildings than does batten seam roofing.

Standing seams are usually made to finish 1" high. Economical spacing of seams calls for copper sheets in stock widths—multiples of 2". A good rule to follow for general requirements is to use 20" sheets.

Standing seams should never be riveted or soldered, as this will prevent movement of the sheets. Cross seams should not be soldered if pitch of roof is sufficient.

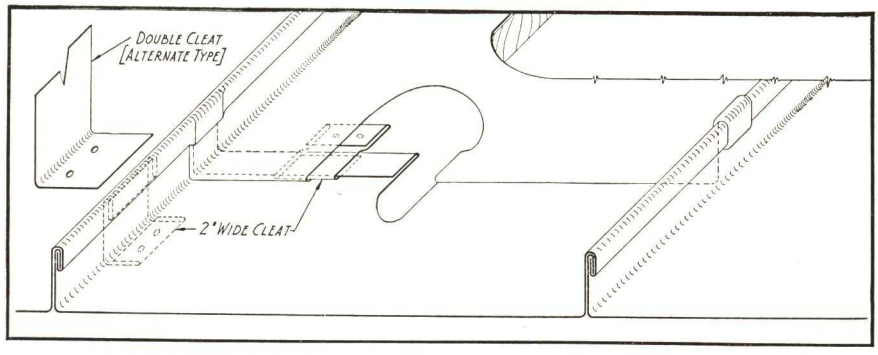
FORMING THE STANDING SEAM

SIZE AND SPACING OF SEAMS Standing seams usually are made to finish 1" high. The spacing of the seams should be made which will call for copper sheets in stock widths.

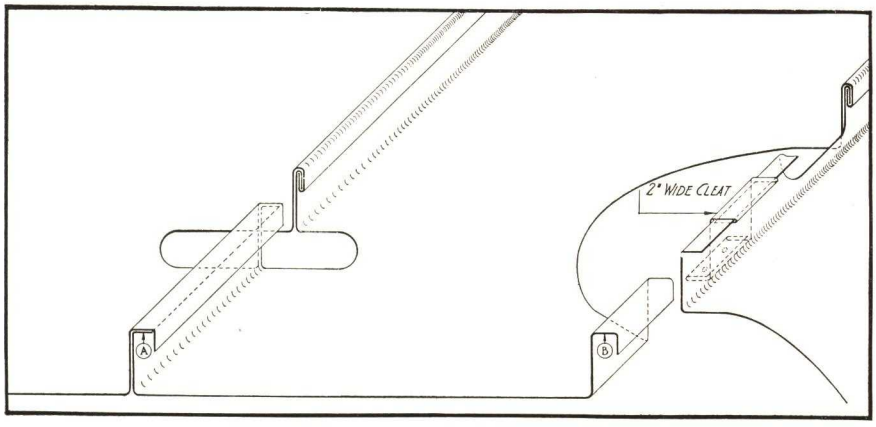
SIZE OF COPPER SHEETS For standing seams to finish 1" high, the sheets will figure 2¾" wider than the seam spacing. Accordingly, a sheet 20" wide would give a seam spacing of 17¼".

To make a 1" standing seam, vertical bends are made on the lengthwise edges of the sheets—on one side 1½" and on the other 1¼", the 1½" vertical bend on one sheet always adjoining the 1¼" bend on the adjacent sheet.

METHOD OF LAYING Cleats 2" by 2½", bent as shown, are nailed to the sheathing 8" to 12" apart against the 1¼" bend of the sheets. The cleats are held with two copper nails and the ends are bent over to cover the nail heads. The last ¼" of the cleats is bent over to hold the sheets. The side of the next sheet having the 1½" bend then is put in place over and against the cleats, and the extra ¼" bent over, as shown. Finally, the top ¼" of the whole seam is folded over again through 180° to form a double-lock.



Typical Bay Standing Seam Method



Typical Bay-Preformed Pan Method

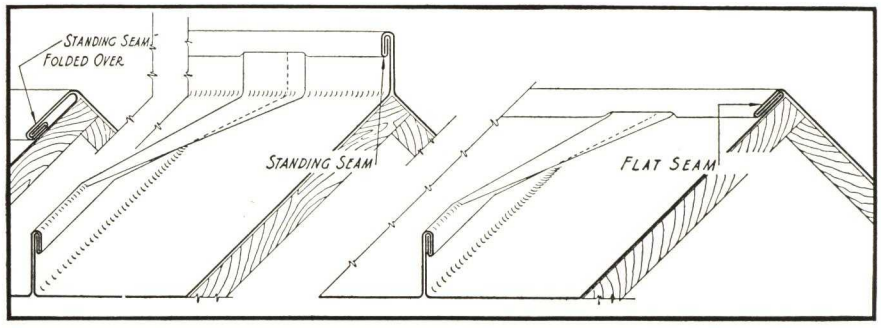
Standing seam copper roof—continued

FORMING RIDGES OR HIPS

The drawing presents various ways of finishing the ridge or hip of a standing seam roof. Pans from the two sides can be brought up beyond the ridge, ¼″ higher on one side than on the other, and a standing seam formed along ridge. If desired, this seam can be folded down flat as shown on left. The standing seams of roof slopes are turned down as they approach the ridge and folded into ridge seam. Ridge and hip standing seams generally are finished same height as those on the roof slopes.

In place of a standing seam, flat-lock seams can be used on a hip or ridge as shown on right of drawing. Here roofing seams are turned down flat in the same direction as seams are formed and folded in with the ridge seam. On one side flattened standing seams run into the ridge seam, and from the other they are carried over the ridge and down into ridge seam.

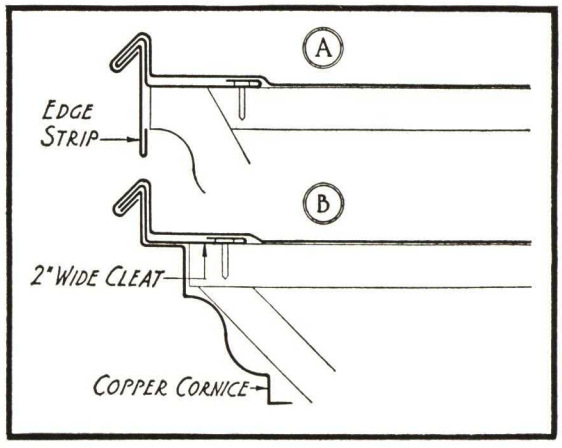
Ridge or Hip Details



FORMING GABLE ENDS

The drawing shows two methods of finishing standing seam roofing at gable of a roof. Detail A provides a drip edge to prevent wash running down face of building in case of overflow at built-up edge; and Detail B assumes a cornice at the end of building. Cornices of considerable height should be made of crimped copper, or built in sections locked together to permit expansion. The 2″ copper cleats should be spaced 8″ to 10″ apart.

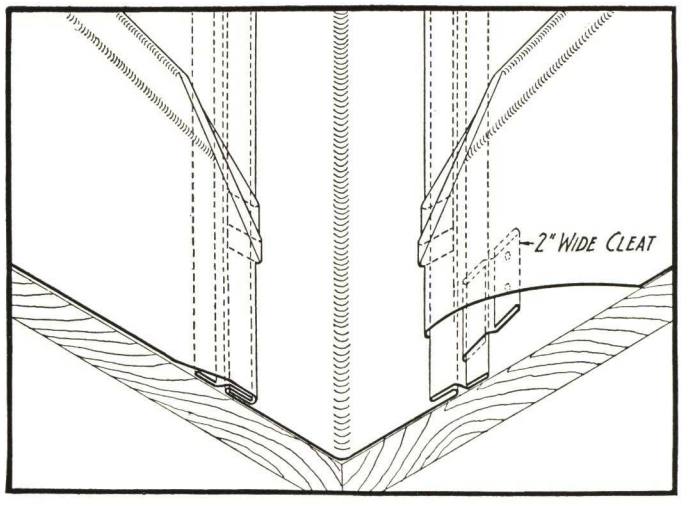
Gable End Details



FORMING VALLEYS

The drawing shows standing seam roofing at a valley. Standing seams are turned down in direction opposite to which they are folded, and together with pans hooked into the valley flashing. Valley flashing is cleated as usual with 2″ cleats 12″ on centers with ends folded over the nail heads.

Valley Details

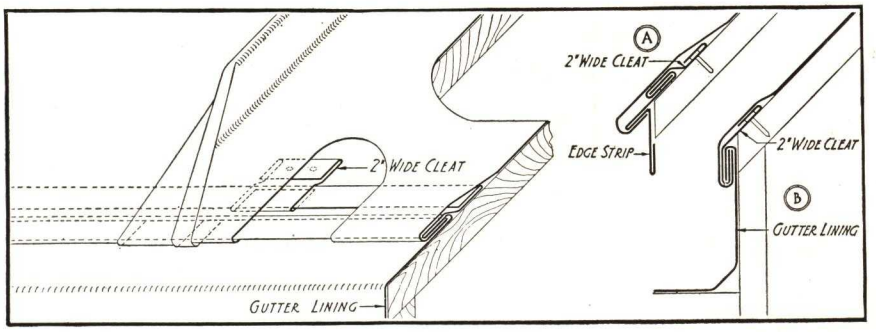


Standing seam copper roof—continued

FORMING EAVES OR GUTTERS

The drawing shows various methods of finishing standing seam roofing at eaves and gutters. The standing seams are folded over (with seam opening at top) as they approach the eaves so they can be folded into the joint with the gutter or over an edge strip. The gutter lock can be placed on roof slope, as shown at the left, or at top of the inner side of gutter, as in Detail B. Gutter should be designed so its outer edge is at least 2″ lower than this seam which is left unsoldered to allow movement in the gutter lining. If there is no gutter a drip edge should be provided as suggested in Detail A. The loose-lock seam where roof and gutter meet may be filled with white lead to prevent water entering from capillary attraction. Do not solder.

Eaves or Gutter Details



PARAPET OR WALL FINISHES

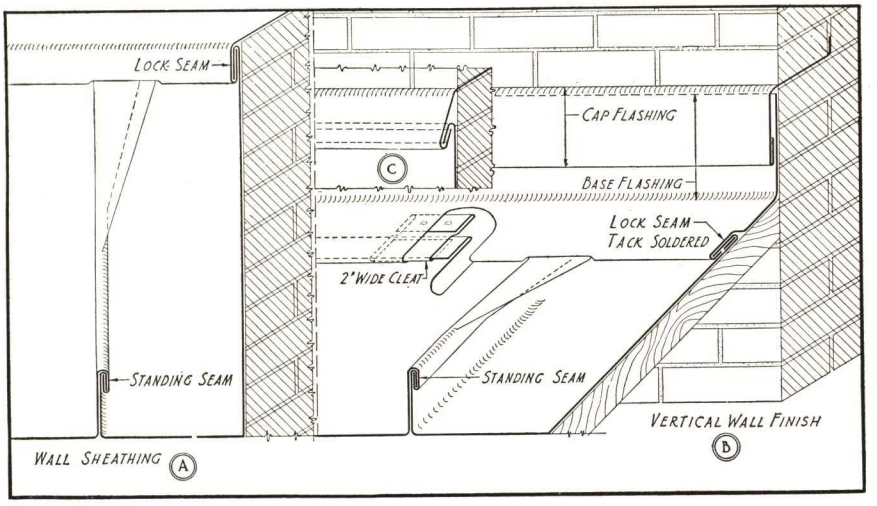
The drawing shows method of finishing standing seam roofing at a wall at top of the roof, using a cap and base flashing. The roofing is carried up close to the wall, with room allowed for cleating as shown. The base flashing is locked into the seam over the cleats and the standing seams are folded down, with the open side underneath and carried into the flat-lock seam which is tack soldered. Another way of securing the base flashing is to use a longer cleat than shown in the drawing, so that the end of the cleat can be brought entirely through the locked seam and turned up on the outside of the base flashing. The base flashing should be carried up the wall at least 6″ and lapped 4″ by cap flashing.

The cap flashing is continuous, with side laps 3″ between sections, and the bottom edge is folded back 1½″ for stiffness. The cap extends at least 2″ into the masonry. If installed as the wall is erected, it should be anchored back of first brick. If placed after the wall is erected, it is fastened with lead plugs.

Detail A shows method of finishing standing seam sheathing of a vertical wall. The standing seams are carried to top of wall where they turn down and finish into the lock seam with wall capping. Such vertical sheathing can be used in place of the cap flashing at the right, when necessary to waterproof the entire wall above the sloping roof.

Detail C shows an alternate of the construction of B. The base flashing is locked into the cap flashing with a deep lock (at least 2″) as shown. This may be left standing out, as in the illustration, or flattened back against the wall. In either event the top of the lock should be from 2½″ to 3″ below the point where the cap flashing enters the wall, so that the base flashing can be locked into it in place.

Details of Parapet or Wall Finishes



For Specifications See Page 27
For Technical Data See Page 18
For Special Flashing.....See Page 14
For Thru-Wall Flashing (Cheney and Revere) See Page 33

FLAT SEAM COPPER ROOF

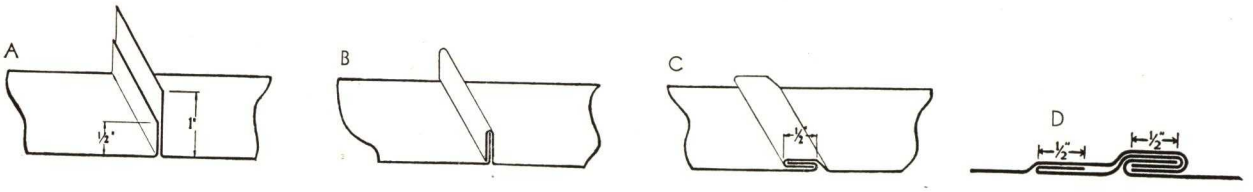
Flat seam roofing is adaptable to all slopes but is used commonly on flat decks or flat roof areas. It can be used on slopes of ¼" or more per foot, since it is necessary only that the roof and gutters have sufficient slope to shed water, but also many very steep roofs, conical spires, towers, domes and other curved surfaces are covered with flat seam roofing.

On curved surfaces the copper sheets are patterned in various shapes and sizes according to contours to be covered, and in all flat seam work large sheets should be avoided. For flat roofs and decks 14" x 20" sheets with ½" seams, flat-locked and soldered are recommended. These sheets are available on order with edges tinned for soldering. If circumstances are such that there is no possibility of water collecting on the roof, the seams can be left unsoldered and should be filled with white lead.

The requirement of soldered seams renders movement resulting from temperature changes of special significance in flat seam work. Consequently, runs longer than 30 to 40 feet of flat seam soldered sheets should not be permitted unless the extremities are free. Large areas should be broken up with expansion joints, such as battens. as shown on drawing page 9.

FORMING THE FLAT SEAM

The seam is developed as shown below, as follows: (1) Tin the edges of the sheets, (2) Bend the edges at right angles, (3) Set the sheet with the short bend in place, (4) Set the second sheet in position A and, (5) Turn the edge of the second sheet 180° down over the edge of the first sheet, B. Finally, (6) Turn all together 90° in the same direction down on the first sheet, flatten and solder C. When the seam is to be cleated down, an additional step is required between (3) and (4) above, namely, (3a). Place the cleat against the sheet and nail the cleat to the roof, turning the end back over the nails. The cleat then is folded in with the sheets. D shows a single flat-lock seam with cleat.

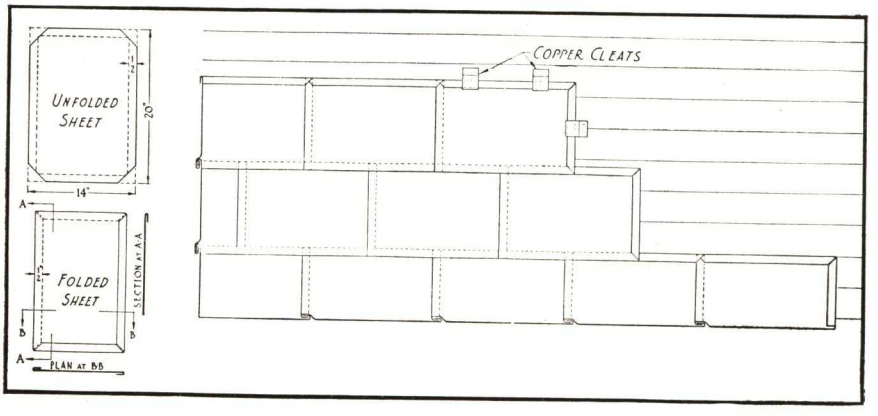


The drawing illustrates the method of laying a typical flat seam area. The sheets are tinned on all edges, for soldering, and then are formed to lock ½" with adjacent sheets. The corners must be properly clipped to permit folding, as shown at left. Opposite sides of the sheets are folded in opposite directions so they can hook into the next sheets properly.

The sheets are held to the surface by 2" copper cleats. Usually two cleats hold one long side and one cleat a short side of each sheet. The other two sides are held by the edges of adjacent sheets already cleated. The cleats should be nailed close to the sheet and the ends folded back over the nail heads. Sheets with too few or poorly nailed cleats will not remain properly soldered.

The cross seams are folded in the direction of flow and it is of great importance that they be well sweated with solder. All seams should be flattened with a mallet before soldering, and then the solder sweated in to fill the seam completely.

Flat Seam Method



Flat seam copper roof—continued

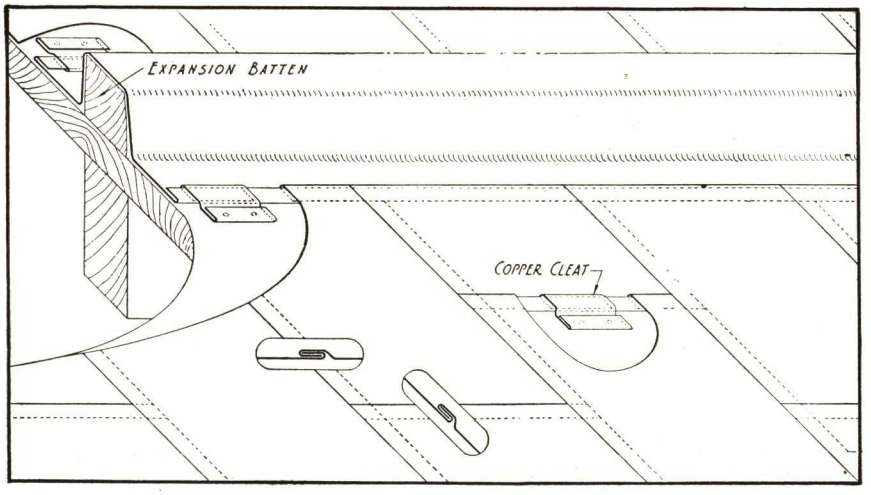
EXPANSION AND CONTRACTION

In the batten and standing seam methods, where longitudinal seams are unsoldered, lateral movement between seams can take place if proper allowance is made at the time of laying. Movement in the direction of the roof slope in such construction also is cared for in various ways, such as loose cross seams where the slopes permit, special forming of the pans, and the strip pan method.

The flat seam method, however, does not allow free movement. The theory of the construction is that each small sheet is a separate unit through being cleated, and that the cleats prevent movement being transmitted over the entire area. Under expansion, each sheet puffs up slightly at the center. Under contraction, the cleats tend to prevent a total area movement being localized, but this is counteracted by the fact that each sheet is soldered to an adjoining one, thereby creating a continuous expanse of copper which is subject to general movement. Consequently, runs longer than 30′ to 40′ of flat seam soldered sheets should not be permitted unless the extremities are free. Large areas should be broken up with expansion joints, such as battens, as illustrated in the drawing. These run in the direction of the slope, and are covered with a copper cap, cleated down, to which adjoining roofing sheets are locked and soldered. The battens are shaped as in batten seam roofing, with bottom corners bevelled to permit the movement required.

If the run from ridge to eaves also has to be broken, steps or drops should be installed perpendicular to the slope. These should be sufficiently high to permit the roofing above and below to be joined with a vertical loose-lock seam on the face of the step. To prevent water entering, the seam is brought far enough above the lower roof area, or filled with white lead.

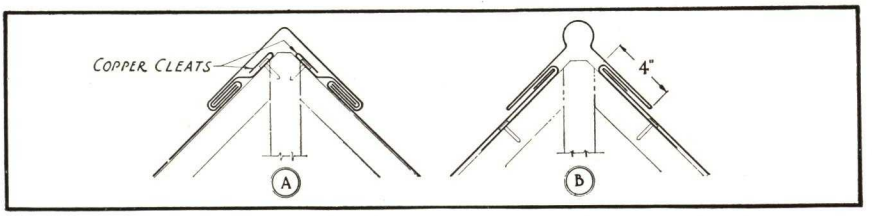
Method of Making Expansion Batten



RIDGES OR HIPS

The drawing shows two varieties of ridge finishes for flat seam roofing. In Detail A a flat copper sheet is folded over the ridge and cleated to the sheating. The roofing is locked into the edge folds, and either soldered or left loose as dictated by the slope. If movement is required, the lock should be large enough to give the necessary lap, or a ridge piece of the type shown in Detail B should be used. This has a large crimp into which the top roofing sheets can slide. The edges of the sheets are folded back for stiffness. The lap is sufficient to give required safety. Other ridge finishes can be used. The details for ridges with standing seam roofing also are applicable with the flat seam method and are usual for the hips of flat seam roofing.

Ridge or Hip Details

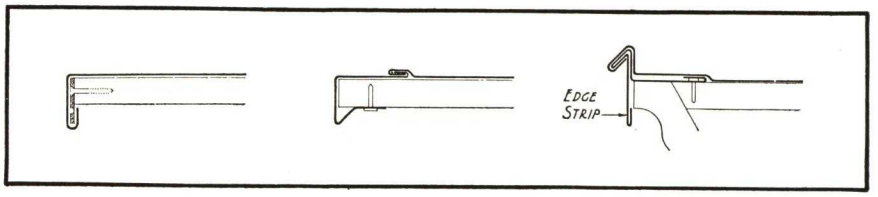


Flat seam copper roof—continued

FORMING GABLE ENDS

Various constructions are shown for finishing flat seam roofing at gables all of which can be used with flat seam work. Those with the edge built up have the distinct advantage of keeping the drainage on the roof at the ends of the building, and are recommended.

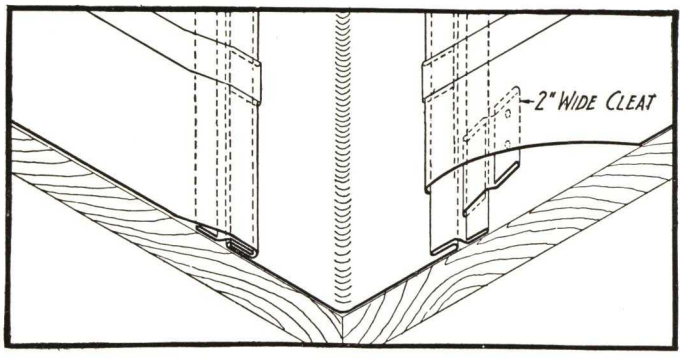
Gable End Details



FORMING VALLEYS

Valleys seldom are encountered in flat seam work, and then are usually continuations over a depression of the flat seam construction. When a valley is to be formed of a continuous sheet in the usual way, the construction is similar to that for standing seam work. The small roofing sheets may lock directly into valley edge-folds over the cleats. In the latter case, the valley lock often is larger than the lock in the roofing sheets. Then if left unsoldered, water will not fill the lock and get under the roofing sheet.

Valley Details

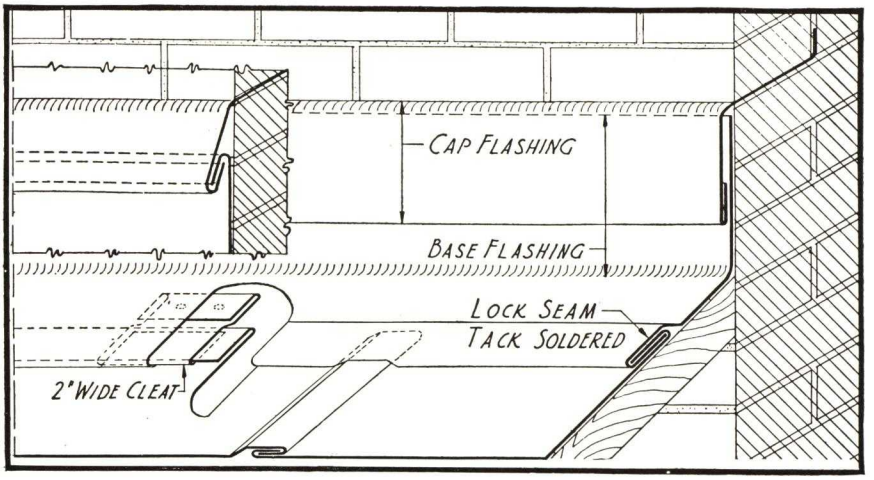


WALL FINISHES

The use of the cap and base flashing principle gives the best construction. The roofing sheets are turned up against the walls at least 6″ and then lapped 4″ by cap flashings set in the masonry. On the side walls the cap flashings should be stepped from course to course as required by the slope; in most cases, as the slope will be slight, there will be considerable length of cap flashing in each course. In exposed locations with long runs it often is desirable to prevent the wind from lifting the cap flashings by inserting brass brackets or straps about 1″ wide and 1/8″ thick at intervals in the masonry, these extending down over the flashing. The cap flashings may be tacked with spots of solder at the side laps.

Insert the cap flashings in walls as the masonry progresses. Except where through flashings are required to waterproof the entire wall, the copper sheets are usually carried into the wall 4″ and turned up 1/4″ back of first brick. If flashings must be installed after the wall is erected, secure them with lead plugs about 1″ wide spaced from 8″ to 10″ apart, filling out the joint with elastic cement.

Wall Finish Details



FORMING OF GUTTERS

Details of various types of gutters will be found on pages further along in this catalog.

For Specifications See Page 27
For Technical Data See Page 18
For Special Flashings . . . . . See Page 14
For Thru-Wall Flashings (Cheney and Revere) . . See Page 33

BATTEN SEAM COPPER ROOF

Copper roofs of this type are characterized by evenly spaced battens or ribs laid parallel and running with the slope of the roof. The battens are usually cypress, spruce or pine strips fastened to the laying surface. The copper sheets are laid between the battens with edges overlaying the latter and interlocked with a copper cap strip over battens; this interlocking construction providing adequately for expansion and contraction, if proper allowance is made for local temperature ranges.

Batten seam roofing is efficient for large roof areas, and is especially popular for public buildings, churches, cathedrals and other large buildings of ornamental and dignified character. Although batten seam construction is generally approved for roof slopes of 3″ or more per foot, it may not be desirable to use it on slopes as low as 3″ for service in localities where quantities of snow and ice may collect.

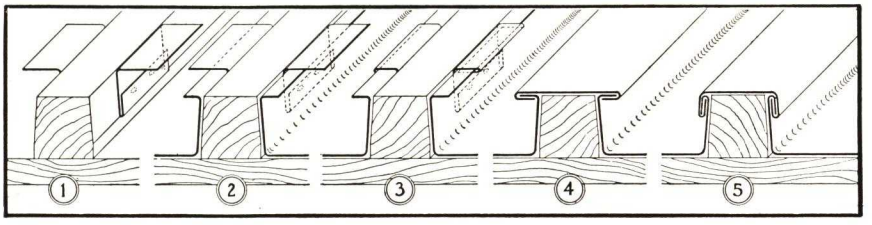
Most battens are of wood, but they may be of heavy copper or copper alloy. Battens are ordinarily spaced from 20″ to 30″ apart; exact spacing being adjusted, to fit width of copper sheets.

FORMING THE BATTEN SEAM

The drawing illustrates the steps in forming the batten seam. (1) Cleats 2″ wide and 3″ long are nailed to the sides of the battens. They should be of 16 ounce copper spaced from 8″ to 12″ apart, secured by two copper nails with ends of cleats turned over to cover nail heads. (2) Copper sheets of required width and properly formed are placed on roof between battens and against and under cleats. The long edges of the sheets have been turned up at right angles, and the final ½″ turned at right angles again. (3) The sheets are secured by turning the free ends of the cleats down and back to engage the edges of the sheets. (4) The rib is covered with a copper cap of proper width, the edges folding back on themselves to engage the edges of the sheets. (5) With the caps in place, the edges are dressed down against the batten, forming ½″ lock seams.

The sheet may be treated in a number of ways at the cross seams and at the corners. Solder should be eliminated where possible, to care for expansion and contraction. The temperature at time of laying should be kept in mind so allowance can be made for expansion, contraction, or both. Two common methods of handling sheets are as follows:

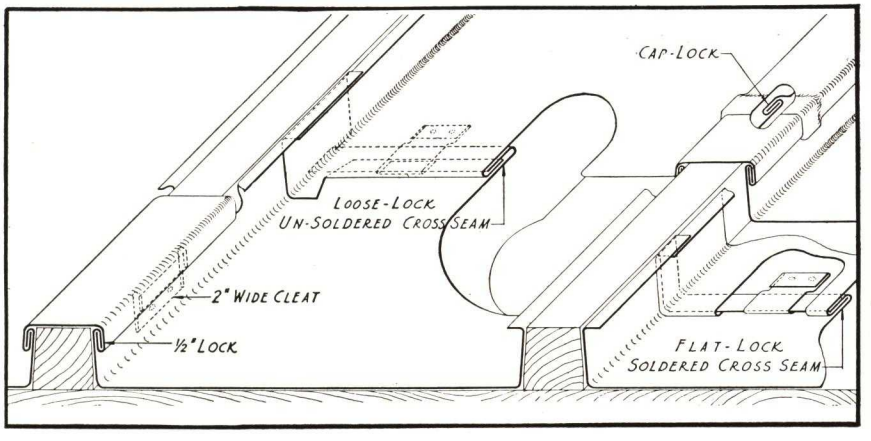
Development of Batten Seam



(1) ROLL METHOD: Full length sheets are flat-locked and soldered together to extend from ridge to eaves. Half-inch seams are used. Strips or rolls are formed on the job, as just described. This method is satisfactory only for short runs that connect directly to eaves.

(2) PAN METHOD: Sheets eight feet long (or shorter), formed to required shape in a brake at the shop. Individual sheets, after bending, are known as pans. This method allows cross seams to go unsoldered, if pitch is sufficient, and is recommended for most work.

Typical Bay Batten Seam Method



Batten seam copper roof—continued

FORMING RIDGE OR HIP

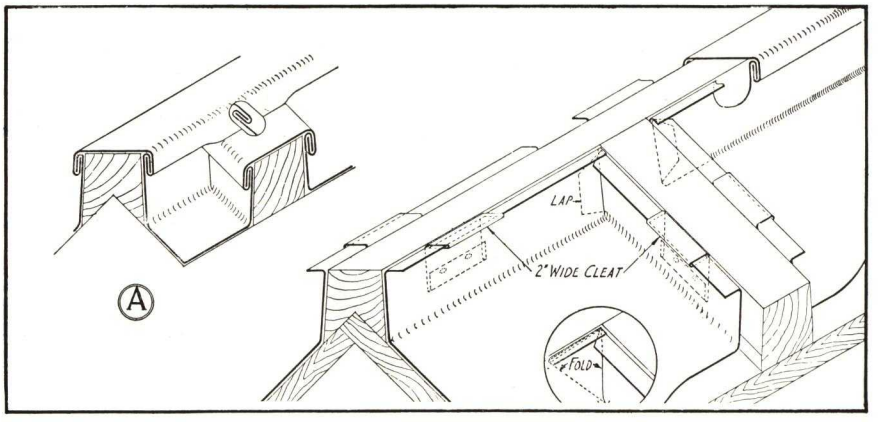
Drawing shows method of constructing a batten seam ridge or hip. Here the dimensions of the ridge batten are controlled by the slope of the roof so the roof battens meet it with top flush. The roofing sheets are cut so they can be turned up in the corners against both battens and have ½″ flanges left to receive cap sheets. An accurate pattern should be made to insure proper fitting of the sheets.

The tab marked "lap," which is part of the side of the pan, is folded back of the sheet and soldered watertight before the sheet is laid. An alternate method, which is preferred by many good roofers, is shown in the small circle. Instead of cutting a tab out at the corner, the excess metal is folded back of the turn-up of the pan, against the ridge batten. This method eliminates the use of solder. After the pans have been cleated in place, the batten caps are slid on and locked.

As shown in Detail A, a tab on the top end of the batten cover is turned back, to lock into the ridge cap. The ridge cap is then fitted into place so as to lock into the top of the roof pan, and the top tab of the batten cap. Between battens this turns down against the ridge batten. At the side battens the flat lock lies on top of the batten cover as shown.

There remains the problems of providing for longitudinal movement of the side and ridge or hip batten covers. These should be formed from strips not over 8 ft. long, locked into adjacent sections.

Ridge Details

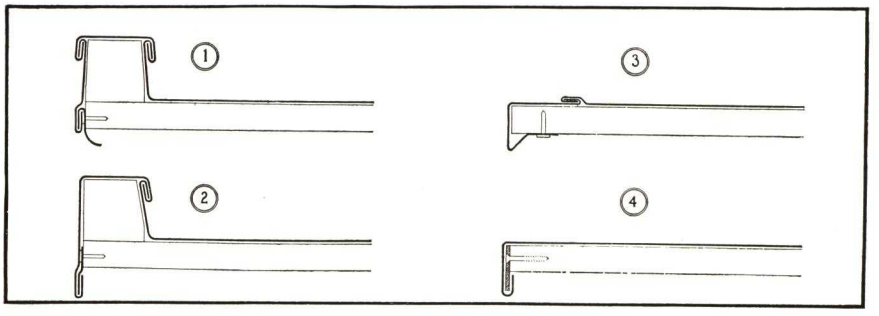


FORMING GABLE ENDS

Drawing shows four methods of finishing batten roofing at sides or gable ends. Details 1 and 2, have the advantage of keeping water from dripping over edge of roof. If a low finish is desired, a drip edge should be provided as suggested in Details 3 and 4. Nails or screws should be placed from 8″ to 12″ apart.

Detail 1 is applicable where roof finishes in a metal cornice, but with nailing as shown the cornice either must be narrow (less than 12″) or built up of sheets loose-locked together to take care of expansion and contraction. In Detail 3, where roofing is nailed, a flat-lock seam caulked with white lead is inserted unless the last batten is within about 12″ of edge.

Gable End Details



FORMING VALLEYS

Drawings show method of finishing batten seam roofing at valley. Valley is constructed with continuous fold-over crimps into which roofing sheets can be locked as shown. A final fold is provided along both edges of valley for cleating. Sheets and caps are folded around the batten ends and secured with lock seams.

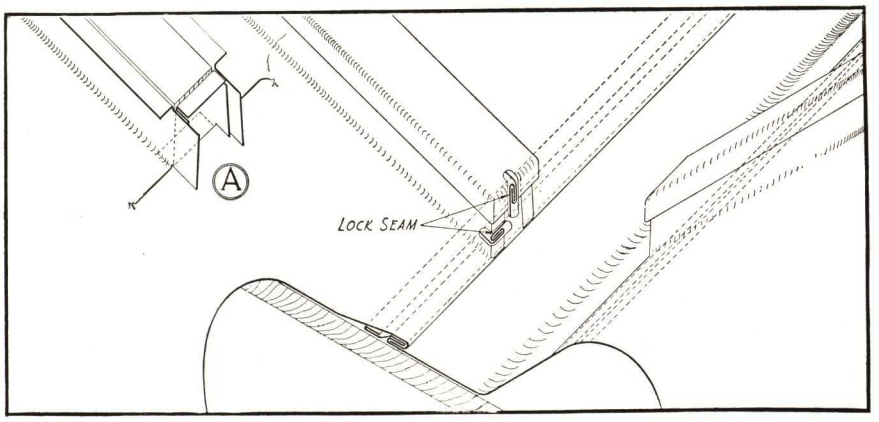
The method of laying out the sheets at batten ends is shown in Detail A. Pans are cut at ends so portions up the sides of battens have tabs projecting beyond the batten ends, and portions of the roof have the ends turned back into the valley crimp. Auxiliary pieces to fit over batten ends are formed and slipped inside the ends of roofing sheets. These end pieces are cut the shape of the batten end but ½″ larger all around, and corners are cut out so that the extra ½″ can be folded toward the front at top and sides, and back into the valley crimp at the bottom.

The 1″ tabs on the sides of pans are folded back ½″ to engage sides of the end cap, and these locks are folded flat against the batten end. Finally, batten cap is placed, and locked to pans as usual. The end of the batten cap has been

Batten seam copper roof—continued

cut so that for the width of batten top it projects 1″ beyond end of the batten. Tab is folded under and back ½″ to engage top flange of end cap, and this lock is then folded down against batten end. Vertical seams of cap are soldered.

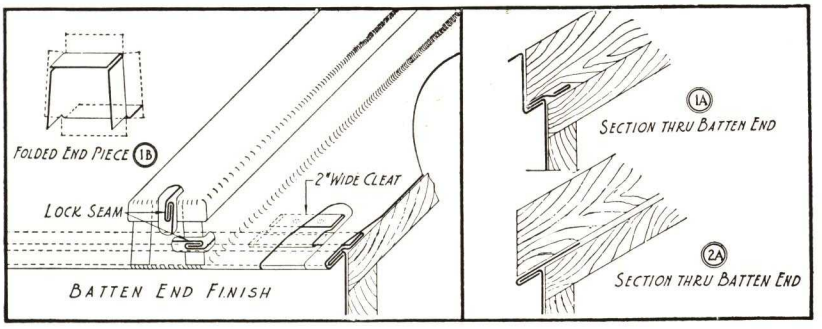
Valley Details



FORMING THE EAVES

In detail at the left the use of the end piece (Detail 1B) and the method of locking the pans and batten cap to it are identical to the valley finish shown in Valley detail. As brought out in Detail 1A, the batten projects slightly at the eaves, and the bottom is sliced off at the end to give room for the edge fold of the gutter lining which is continuous along the roof for cleating. A crimp is put in the gutter lining under the end of the batten so the end piece may be locked over it. Detail 2A shows another method.

Eaves Details

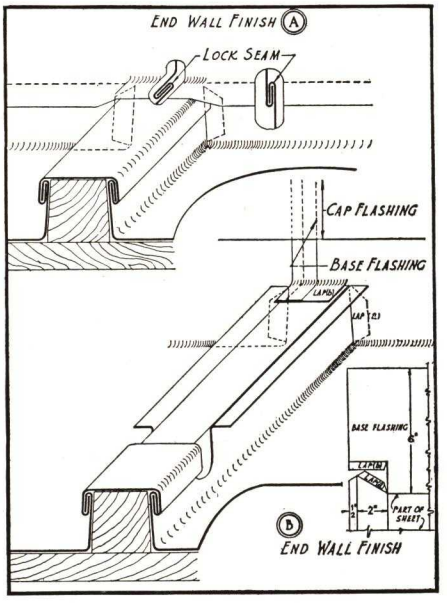


WALL FINISHES

When a batten roof slopes from a wall, one type of construction is shown in A. Pan sheets are cut at corners to turn up against the wall and battens. They extend up the wall the height of the battens with ½″ of additional metal forming a lock with wall sheathing. Tabs (dotted) are folded against backs of the ends of the pans and soldered. When batten cap is placed it has an extra ½″ at upper end, the width of batten top, which is folded down to form a hook. Finally, the wall sheathing, provided with a continuous ½″ fold along the bottom edge, is locked into pans and batten caps, and seam is dressed down, flat on top of the battens, and vertically against the wall. This lock should not be soldered, but filled with white lead.

The method shown in B makes use of a cap and base flashing finish at wall. The pan is cut as shown at lower right, allowing it to be folded into the corner between wall and batten, and to extend up the wall 6″ as a base flashing. Lap (a), which is part of pan on side of batten, is folded in back of base flashing and carefully soldered watertight. Lap (b) extends a short distance down over batten, and is joined to a similar sheet from the other side by either a lock or a lap seam. Lap (b) is raised slightly from batten to permit sliding batten cap under it. After batten cap has been locked to flanges of pans lap (b) is soldered to it around three sides, and vertical joints between the upper end of batten cap and base flashing also are carefully soldered.

Cap flashing should be inserted in the masonry. Side laps between sections of the cap flashing should be at least 3″ and the cap flashing should lap base flashing at least 4″. Side wall finish is the same as any regular parapet flashing.



For Specifications See Page 27
For Technical Data See Page 18
For Special Flashings . . . . . See Page 14
For Thru-Wall Flashings (Cheney and Revere) . . See Page 33

SPECIAL FLASHINGS

In roofs and walls of a building there are many places where joints must be watertight. Sheet-metal protection—flashing—is best for this purpose.

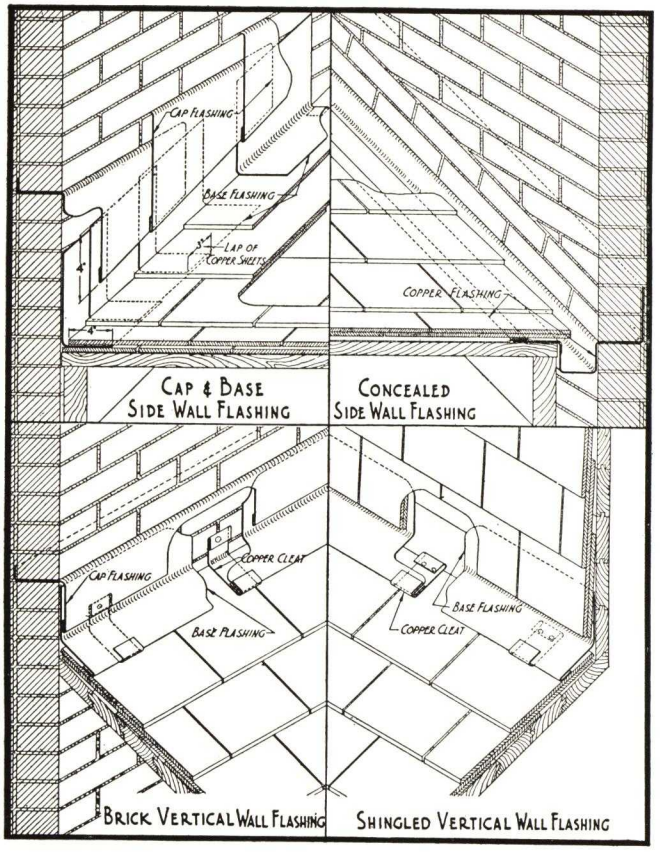
Joints where one roof surface intersects another to form a valley, at gutters, and where parts of building project above or through roof, such as chimneys, dormers, vents, etc., are sources of possible trouble from leaks.

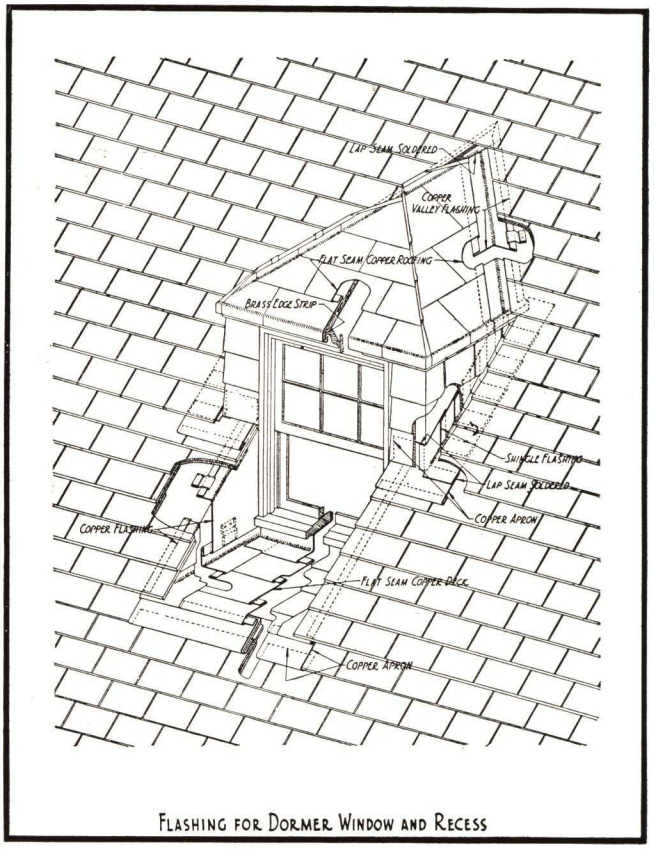
Valleys and gutters are not to be catch-basins or reservoirs, but channels to lead water away. Wall flashings should be designed and placed to turn all water and moisture to outside face, where additional means of drainage should be provided.

Leaks in flashings may be caused by breaks in material due to corrosion or mechanical failure, or defective protection of joint. General acceptance of copper as the best metal for flashings and accessory parts is due to its many fine qualities, including lightness in weight, ductility, ease of handling, and the fact that it resists corrosion.

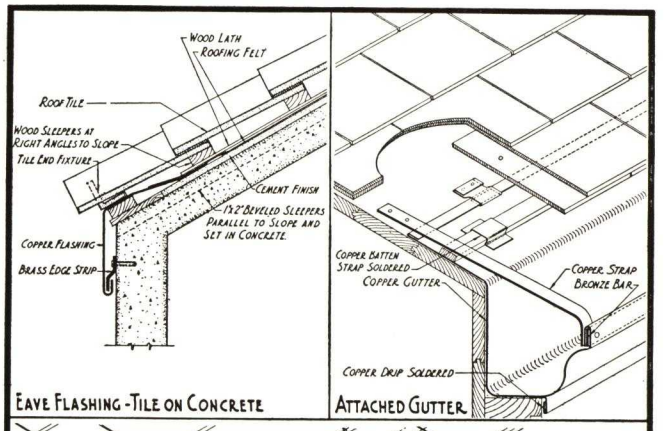
No matter how good a material may be available for a given purpose, if it is misused it cannot perform with satisfaction. Copper, as well as all other materials, must be used properly to give the fine service of which it is capable.

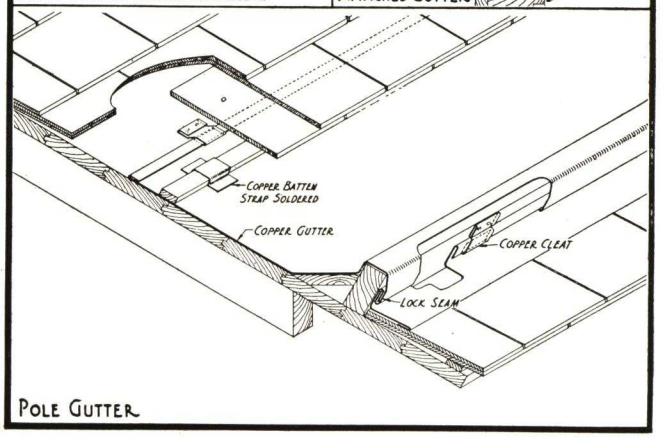
For Thru-Wall Flashing, (Cheney and Revere) see Pages 33 to 38. A handbook is available which gives considerably more flashing detail than is possible here.



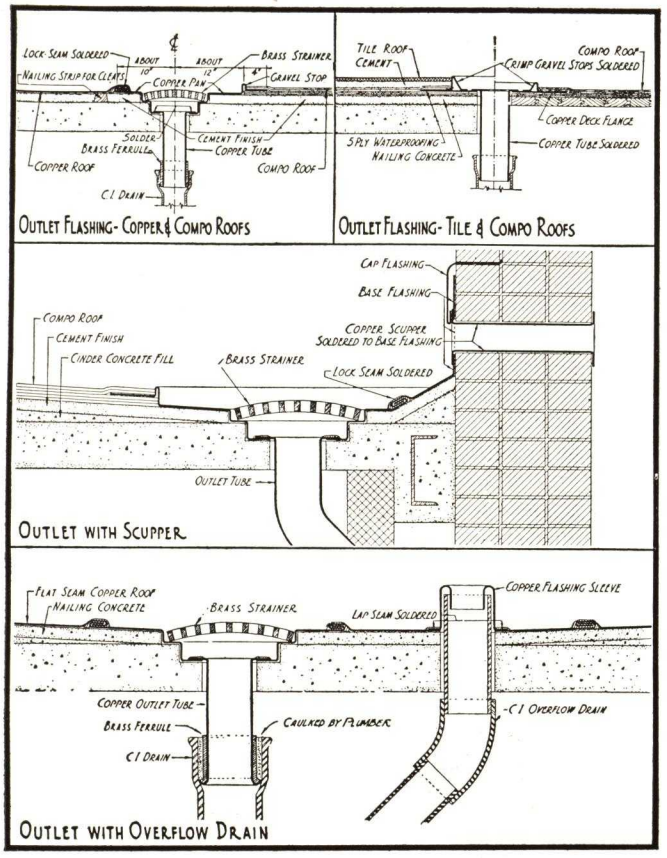


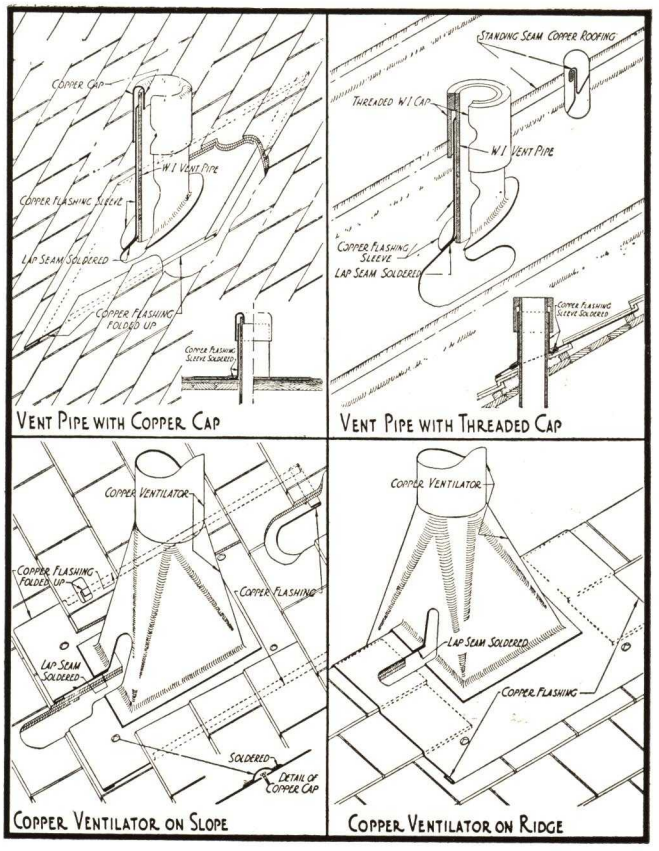
FLASHING FOR DORMER WINDOW AND RECESS

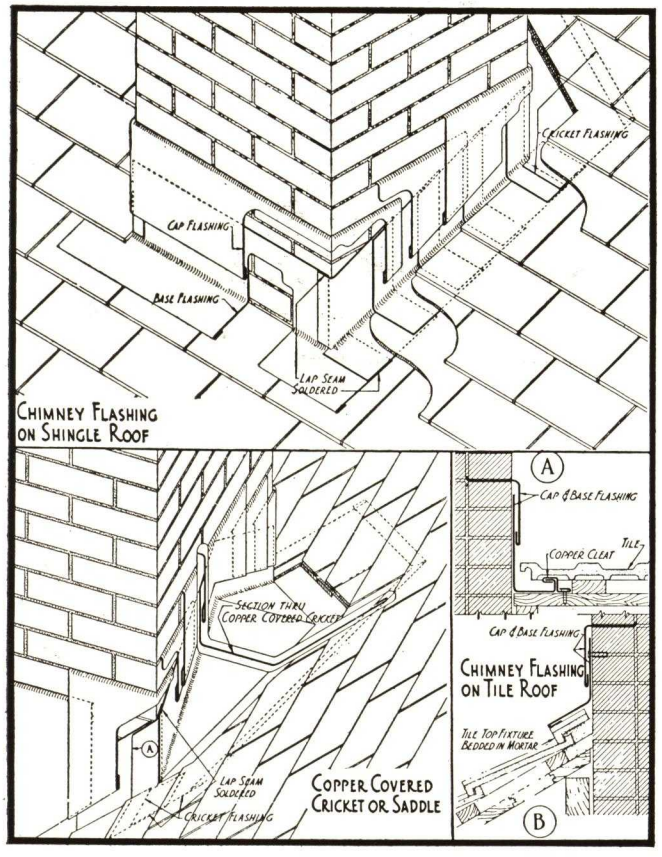


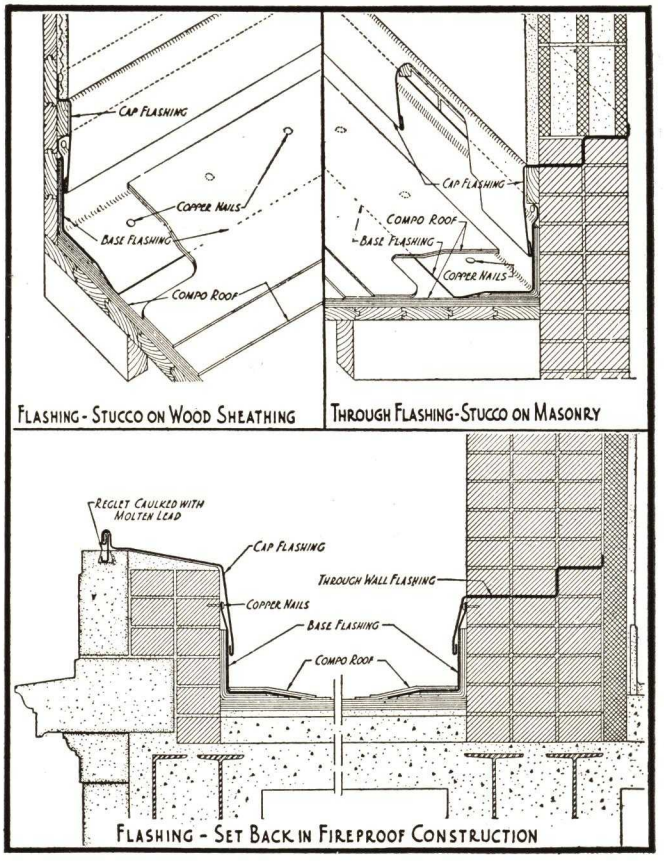


POLE GUTTER









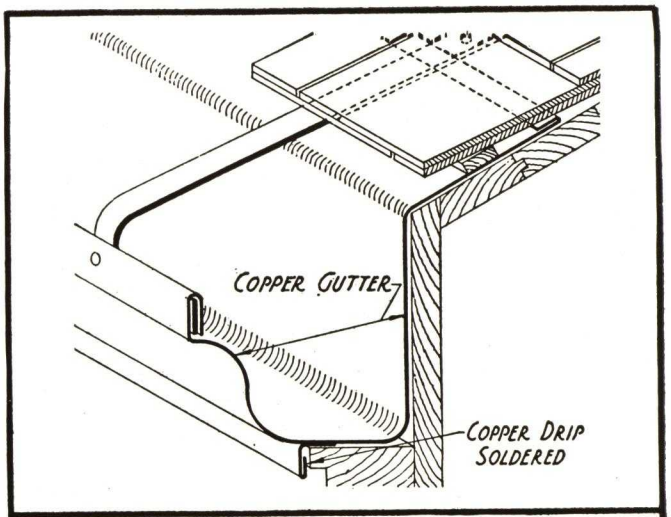
FOR THRU-WALL FLASHING SEE PAGE 33

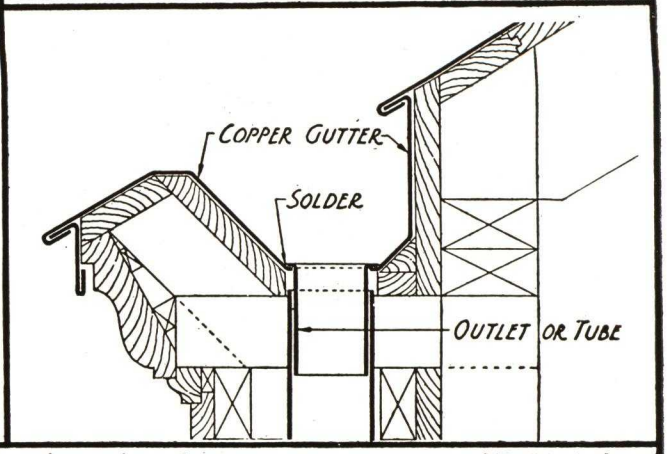
GUTTERS

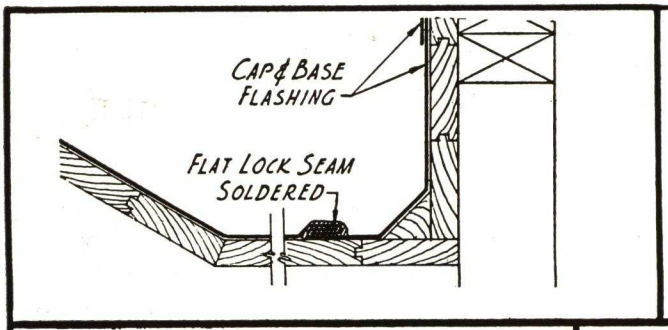
An ideal drainage system must be designed so it will carry away the water shed by the roof, most efficiently. Roofs, flashings and valleys should be constructed to shed the water and turn it toward gutters and outlets as speedily as possible. Gutters and leaders should have capacity for the maximum amount of water and yet not making them too large to be wasteful. Outlets should be designed to transfer the horizontal gutter flow into vertical leader flow with the greatest efficiency.

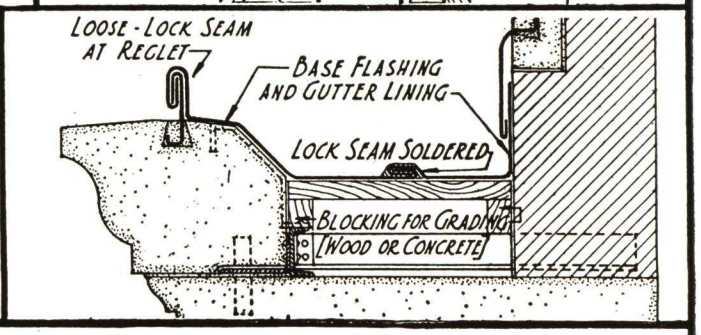
COMMON FAULTS The following give some faults to be avoided in gutter design and show they can be overcome:

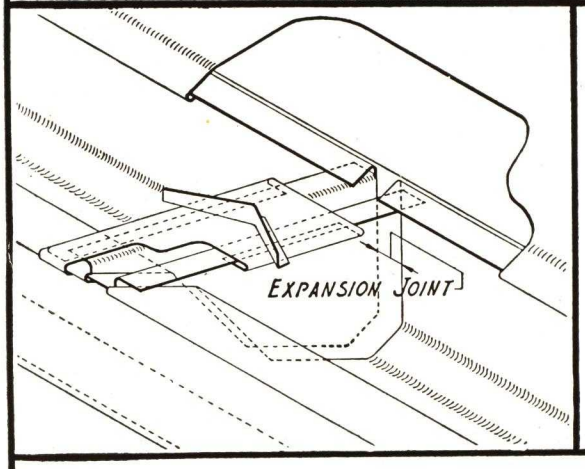
1. **Gutters or outlets too small, or of improper shape.** If gutter is too small, or if the outlets will not permit the leaders to empty the gutter fast enough, water or snow either backs up behind flashings and leaks into the building or spills over the outside causing staining and other troubles.
2. **Improper spacing or number of leaders.** If the leaders are insufficient in number, too small, or spaced too far apart, the water is not drained fast enough and overflow results.
3. **Expansion and contraction neglected.** Expansion and contraction must be cared for or the metal will buckle and break, and leaks result. See drawing in lower left corner of this page.
4. **Lack of scuppers or overflow drains.** If these are not provided for enclosed roof areas, stoppage will cause an overflow.
5. **Improper provision for snow and ice.** Gutters should have all the slope possible, which means high points and short runs in shallow gutters between carefully spaced outlets.

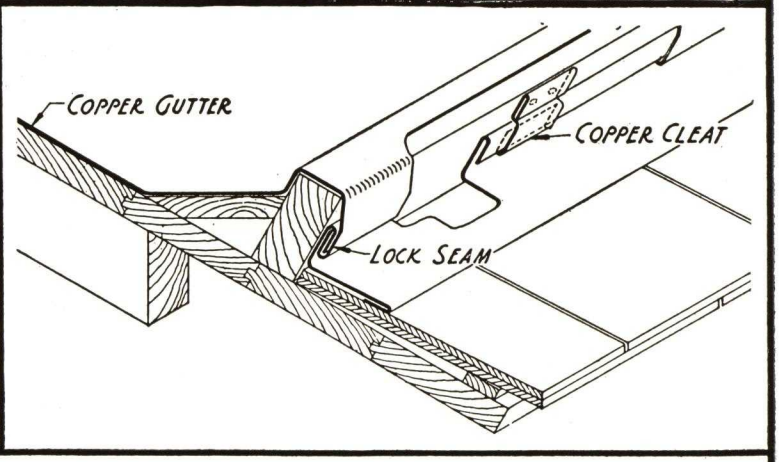












A FEW EXAMPLES OF PROPER GUTTER DESIGN

PROPORTIONING GUTTERS The design of the various portions of a drainage system as far as capacity is concerned is dependent upon the amount of water to be handled. This in turn depends upon the rainfall in the particular locality and the amount of roof area tributary to the unit in question.

The roof area used in computations should be the actual area and not the horizontal projection of the area. Rain seldom falls vertically, and the maximum condition exists when it strikes perpendicular to the roof surface, making the total area effective.

GUTTER DESIGN

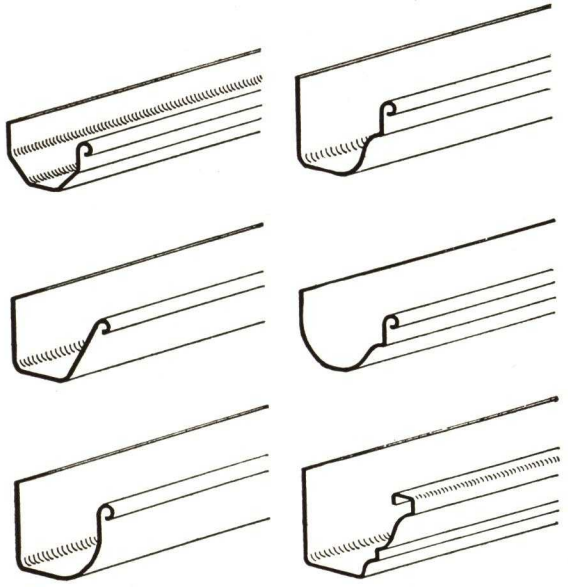
RESIDENCE WORK Judgment plays a large part in the design of gutters. The type of structure and the requirements as regards overflow have an important bearing in the matter.

The best type of gutter has the minimum depth equal to half and the maximum depth not exceeding three-quarters of the width. Thus the width becomes the deciding factor in proportioning its size. There is no reason for a gutter deeper than three-quarters of the width except for ornamental purposes, and for practical reasons it is distinctly desirable to keep the gutter shallow. Assuming that this proportion is observed the gutter may be referred to by its width only.

MONUMENTAL BUILDINGS This title is here used to refer to all installations where the conditions are such as to require very *adequate* and *liberal design* in order to insure against any possibility of gutter overflow. Such conditions exist for the most part in special cases of monumental structures where the arrangement is such that a single overflow is to be avoided as having serious consequences.

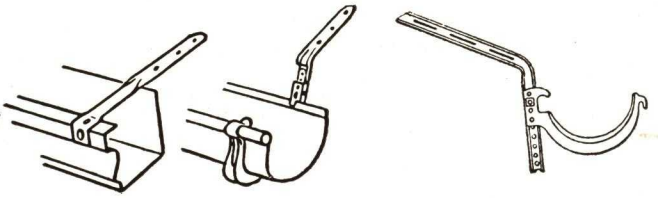
MOULDED GUTTERS AND TROUGHS

In addition to the built-in type of gutters that are an integral part of the roof—pre-moulded types are available. Half round types are stocked throughout the country. The moulded types (a few styles shown below) are usually made up as required by the roofing contractor.



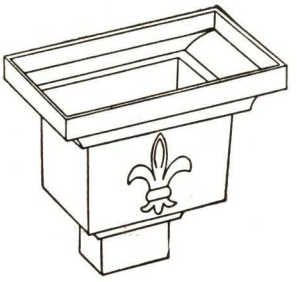
GUTTER HANGERS

There are many kinds of copper hangers on the market, most of which are satisfactory for the special conditions for which they are made. Several varieties, but by no means a complete selection of those available, are illustrated.



LEADER HEADS

A typical ornamental leader head, of stock design is shown below. A number of other stock designs are readily available or special designs can be quickly made up, in which case the number required largely controls the cost of manufacture. An ideal metal to use for ornate needs is Leadtex. This metal is fully described on pages 21 to 26.



LEADERS

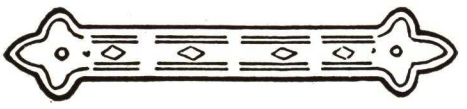
Leaders or conductors are made in four different shapes. Special designs may also be had upon application. Plain round leaders are not generally stocked by manufacturers and jobbers. They are not generally used because, they do not resist freezing

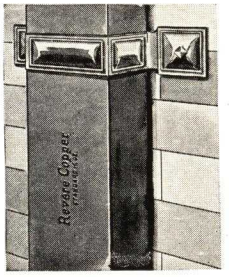
RECTANGULAR CORRUGATED CORRUGATED ROUND

as well as do the corrugated ones. Moreover the latter are more pleasing in appearance when in place than are the plain ones. Sixteen ounce leaders are regularly furnished in 10′ lengths.

LEADER STRAPS

A typical flat type leader strap is illustrated below. Many other types of flat and cast straps are regularly stocked by supply houses.





NOTE: Copper or lead-coated copper gutters, leaders trought, leader straps and other accessories are not manufactured by Revere Copper Brass Incorporated. However, a list of reputable fabricators using Revere copper or lead-coated copper will be furnished upon request.

The Revere mark is an identification of quality on gutters and downspouts.

SPIRES, DOMES AND TOWERS

Special forms of roofing, as spires, domes and towers, should be designed after full consideration of special features involved, but the main principles of sheet copper application should be adhered to in every case. Neither architect nor competent sheet metal contractor should have difficulty with particular installations.

There are many possible forms of domes and spires. These usually are covered with copper because of its lasting qualities. Freedom from deterioration over long periods is very important for such installations where expensive scaffolding is necessary for repairs.

Standard methods of copper application all are suitable for covering spires, domes or towers, and the decision of which to use will depend upon architectural considerations and specific features of the case in hand. For instance, on a small dome, the batten method probably would not be artistically appropriate or easy to apply because of sharpness of the curvature. The flat seam method could be used with entire satisfaction.

In using the batten seam method on towers and domes, rib spacing should be worked out carefully so all bays will be identical. Patterns usually are made of roofing paper or iron. Cross seams may be staggered, and if decided on it is advisable to lay out two sets of patterns for alternate bays. Where curved or double-curved surfaces are to be covered, the size of sheets should be limited to cover an area which departs only slightly from a flat surface. On very sharp curvatures difficulty is encountered in forming battens, and in keeping longitudinal seams from binding, it is better to use flat seam construction.

Flat seam roofing is applicable to virtually all styles of domes and towers. As in flat roofing work, it is best to use small sheets. On domes the sheets usually vary in size from one course to the next, but those in any one course generally are made from the same pattern. When laid in horizontal rings, vertical joints should be staggered. Sheets also may be laid with diagonal seams, if that effect is more desirable.

TECHNICAL INFORMATION

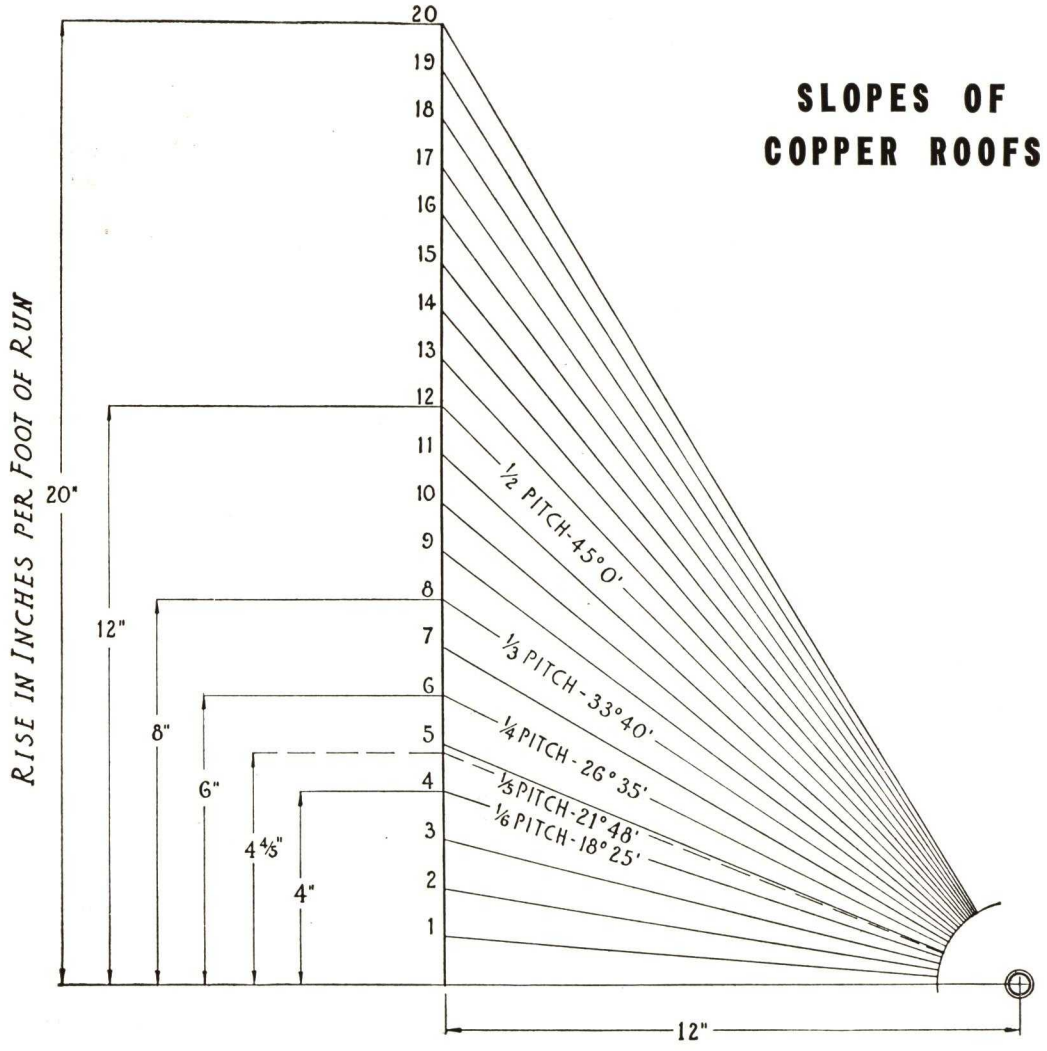
SLOPES OF COPPER ROOFS

The slopes of a roof, having been determined by style or architectural design of the building, and climatic and drainage considerations, will determine in large measure the application of copper, both as to standard method to be employed and details of its use.

(A) BATTEN SEAM Can be used on slopes of 3" per foot and greater.

(B) STANDING SEAM Can be used on slopes of 2½" per foot and greater.

(C) FLAT SEAM Can be used on slopes of ¼" per foot and greater.



WEIGHTS OF COPPER SHEETS

Copper sheets are made in all weights and gauges up to a thickness of ¼". Greater thicknesses are classed as plates. The weight of copper sheet used should be governed by the type of service required of it.

Sixteen-ounce copper has been shown by experience to be the minimum weight for gutters and leaders and most types of flashings; also for roofing work on large structures and in congested localities. Copper installations which have lasted through the years are 16-ounce or heavier.

Under special conditions of unusual exposure or heavy duty, where corrosion and erosion are both severe, the weight of copper should be increased. For example, on roofs of heavy slates or tiles 18-ounce or 20-ounce copper flashing is recommended.

In suburban or rural locations, 10-ounce copper, properly installed, is considered satisfactory for sloping roofs of residences and for small roof areas. However, 16-ounce copper is recommended for flashing, valleys, leaders and gutters used in conjunction with the lighter weight roofing copper. Nothing lighter than 16-ounce copper should be used for flat areas which demand the soldered flatseam construction and where conditions are more severe than on steep slopes.

The gauge of sheet copper is expressed by the ounce weight per square foot; "16-ounce copper" means copper weighing 16-ounces per square foot.

TABLE OF SIZES AND WEIGHTS OF COPPER SHEETS

Regularly Stocked by Sheet Metal Distributors (other sizes available on order)

ROOFING TEMPER		CORNICE TEMPER	
SIZE and WEIGHT	Estimated Pounds Per Sheet	SIZE and WEIGHT	Estimated Pounds Per Sheet
Soft Sheet Copper		Cold Rolled Sheet Copper	
14 Oz. 20" x 96"	11⅔	14 Oz. 20" x 96"	11⅔
24" x 96"	14	24" x 96"	14
30" x 96"	17½	30" x 96"	17½
36" x 96"	21	36" x 96"	21
16 Oz. 20" x 96"	13⅓	16 Oz. 20" x 96"	13⅓
24" x 96"	16	24" x 96"	16
30" x 96"	20	30" x 96"	20
36" x 96"	24	36" x 96"	24
18 Oz. 20" x 96"	15	18 Oz. 20" x 96"	15
24" x 96"	18	24" x 96"	18
30" x 96"	22½	30" x 96"	22½
36" x 96"	27	36" x 96"	27
20 Oz. 20" x 96"	16⅔	20 Oz. 20" x 96"	16⅔
24" x 96"	20	24" x 96"	20
30" x 96"	25	30" x 96"	25
36" x 96"	30	36" x 96"	30
24 Oz. 20" x 96"	20	24 Oz. 20" x 96"	20
24" x 96"	24	24" x 96"	24
30" x 96"	30	30" x 96"	30
36" x 96"	36	36" x 96"	36
32 Oz. 20" x 96"	26⅔	32 Oz. 20" x 96"	26⅔
24" x 96"	32	24" x 96"	32
30" x 96"	40	30" x 96"	40
36" x 96"	48	36" x 96"	48

STRIP COPPER	
SIZE and WEIGHT	Estimated Pounds Per Sheet
Cold Rolled Strip Copper	
16 Oz. 10" x 96"	6⅔
12" x 96"	8
14" x 96"	9⅓
15" x 96"	10
COPPER IN ROLLS	
Soft Copper in Rolls	
16 Oz. 6"	
7"	
8"	
10"	
12"	
16 Oz. 14"	
16"	
18"	
20"	
10 OUNCE COPPER ROOFING	
10 Oz. 16" x 72" *(One size only)*	5

PARALLEL EDGE STRIP COPPER

Each Strip Stamped "Revere Standard 16 Oz." For the manufacture of Gutters and Leaders, this is furnished in exact lengths of 120 inches to 124 inches only; in widths from over 6 inches to 19½ inches inclusive.

In 16 Oz. Sheet Copper only, lengths of 120" are also considered stock sizes in the widths shown above for 96"

TEMPER OF COPPER SHEETS

Copper sheets are made in varying degrees of temper, or hardness. Experience has established two of these as best suited for building consrtuction. The industry has come to know these as "soft" or "hot-rolled," and "hard" or "cold-rolled" copper; and it is common practice to designate the sheets in specifying or ordering. These terms sometimes have caused misunderstanding and it is recommended that the two tempers be referred to as "roofing temper" and "cornice temper." Manufacturers know definitely what these degrees of hardness are; first is soft-rolled and second hard-rolled, to be sure, but the amount of temper is fixed. The trade and architectural profession, therefore, are urged to employ the following terms, which are in fairly general use:

Instead of	Use
Soft, Soft-rolled, Hot-rolled	Soft (Roofing Temper) *abbrev.* (R. T.)
Hard, Hard-rolled, Cold-rolled	Hard (Cornice Temper) *abbrev.* (C. T.)

TEMPER FOR VARIOUS USES

Use soft (R.T.) copper for roofing, all flashing, and counter-flashing work; also in all other places where shaped or formed work is supported, such as in built-in or box gutter linings, etc.

Use hard (C.T.) copper for all hanging gutters, eaves, troughs, downspouts, cornices—or wherever stiffness is necessary to support or maintain shape and contours of the work.

SOLDERING

Soldering and soldered seams should be avoided where possible. There are many instances in sheet copper work, however, where solder is necessary, and in these the joints must be tight and strong.

Success in soldering depends in great measure on the care exercised in cleaning the surfaces, for solder will not adhere to a dirty or greasy surface. Fluxes are used to remove and prevent the further formation of oxide, as solder will not adhere to an oxidized surface.

Joints to be soldered should be closely fitted together. It is a mistake to suppose an excess of solder will give a strong joint.

In all applications it is important to eliminate solder wherever possible, so that the sheets will be free to move. The copper should be laid with proper consideration to present and future temperatures, and the seams formed, and if necessary treated, so that watertightness will be assured and buckling prevented.

CLEATS FOR COPPER WORK

Cleats should be made of 16-oz. soft (R.T.) copper, not less than 1½″ wide, and should be fastened with two copper or copper alloy nails. A width of 2″ is preferable, as it gives a stronger cleat and removes possibility of the nails tearing out. The nails should be placed in line parallel to the edge of the sheet to keep the cleat from turning. The end of the cleat must be bent back over the nails to prevent the nail heads from cutting the sheet.

The length of the cleat is determined by the kind of seam with which it is used.

The maximum spacing of cleats should not exceed 12″; a spacing of six or eight inches is recommended. This does not apply to concealed valley flashings, etc., where the sheet or strip is held by the roof covering. Under these conditions the spacing may be increased considerably; a maximum of 24″ is recommended.

The cleat holds the copper sheet. If it also secures a second sheet, it is folded in with the sheets as the seam is formed. In such cases the cleat must be nailed down before the sheets are brought together.

Proper cleating is highly important on large flat seam roofs. Here the seams usually are soldered to make the work watertight, and expansion and construction movements are allowed for in the cleats, which also should restrict these movements to the individual sheets.

NAILS

Some flashings such as those around windows, doors, and gravel stops, must be nailed. The flashing strip is fastened only along one line, and is free to move to and from the line of nailing. The longitudinal movement is cared for by placing the nails a short distance apart and by the use of soft (R.T.) copper.

The danger of using iron or steel nails with copper cannot be over-emphasized. No economy results from saving a few dollars in nails which corrode and thereby ruin the roof.

The proper nails to use with sheet copper are large flat-head wire nails. These differ from ordinary wire nails in design of head and of the shank immediately under the head. The ordinary wire nail has a ridge or shoulder under a smaller head. This makes it impossible to drive the nail home without injuring the sheet.

1. Use only copper or copper alloy nails; never use iron or steel.

2. Flat-head wire nails not less than No. 12 gage and not less than ⅞″ long are recommended for wood and nailing concrete.

SURFACES FOR LAYING COPPER

Before applying copper to any surface it should be smooth and even, and free from all small projections and hollows. Surfaces should be absolutely dry when copper is laid.

WOOD SHEATHING Proper wood sheathing forms an excellent laying surface for sheet copper. It should be firmly nailed down, all joints true and even and all nail heads set. No copper should be laid unless the boards are thoroughly dry.

CONCRETE AS A BASE When copper is laid on concrete the surface should be made smooth by a wash of neat cement. Heavy coats of asphalt paint also are satisfactory for this purpose.

Cinder concrete should not be used in contact with copper because the cinders may have ingredients which combine with moisture of condensation to form injurious solutions.

GYPSUM AND MISCELLANEOUS LAYING SURFACES Gypsum also is well adapted for use as a base for copper roofing. What has been said of concrete also will apply to this material, except that gypsum can be nailed into directly. It is important, however, that the proper nails be specified to give necessary holding power.

BUILDING PAPER OR FELT Under all copper roofing, valleys and gutter linings, a waterproof building paper or roofing felt should be used. It provides a smooth surface to contact the copper, and when properly lapped protects it against moisture from condensation.

MAINTENANCE OF COPPER WORK

Copper work requires little or no maintenance if properly installed. No painting is necessary, and its attractive green patina, which forms in time, is a protection as well as a beautifier. Periodic inspection should be made as a matter of routine to see that no physical damage has been done, to insure unclogged outlets, and to remove all foreign matter that may have been deposited on the roof.

REVERE LEADTEX

LEAD—COATED COPPER

WHAT IT IS....

Leadtex is Revere Sheet Copper which has been coated with lead by a special process which produces a uniform coating with a perfect bond. It combines workability, light weight, permanence and economy of sheet copper with mellow color, decorative range and protective finish of lead. It is available in three finishes on a base of 10 to 20 ounce copper.

WHERE IT IS USED....

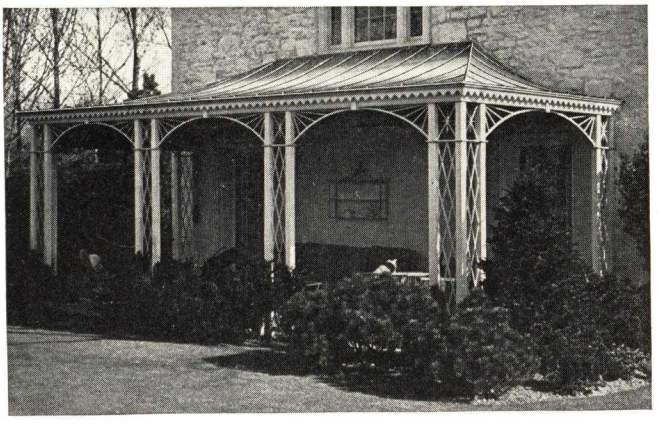
For hundreds of years lead has been used successfully for architectural purposes, due to its easy workability and high resistance to weathering. Freshly worked or cut lead has a lustrous metallic cast which turns into a soft gray tone when exposed to the atmosphere, harmonizing with practically all materials of construction.

The value of lead in regard to protection and appearance does not depend on its thickness. However, lead possesses very little strength, and in employing it for a building material it is necessary as a rule to use relatively thick lead sheet to give sufficient rigidity to the construction. Since lead has a high density, the possibility of obtaining a lighter construction material possessing advantages of both lead and copper is welcomed by the building trade.

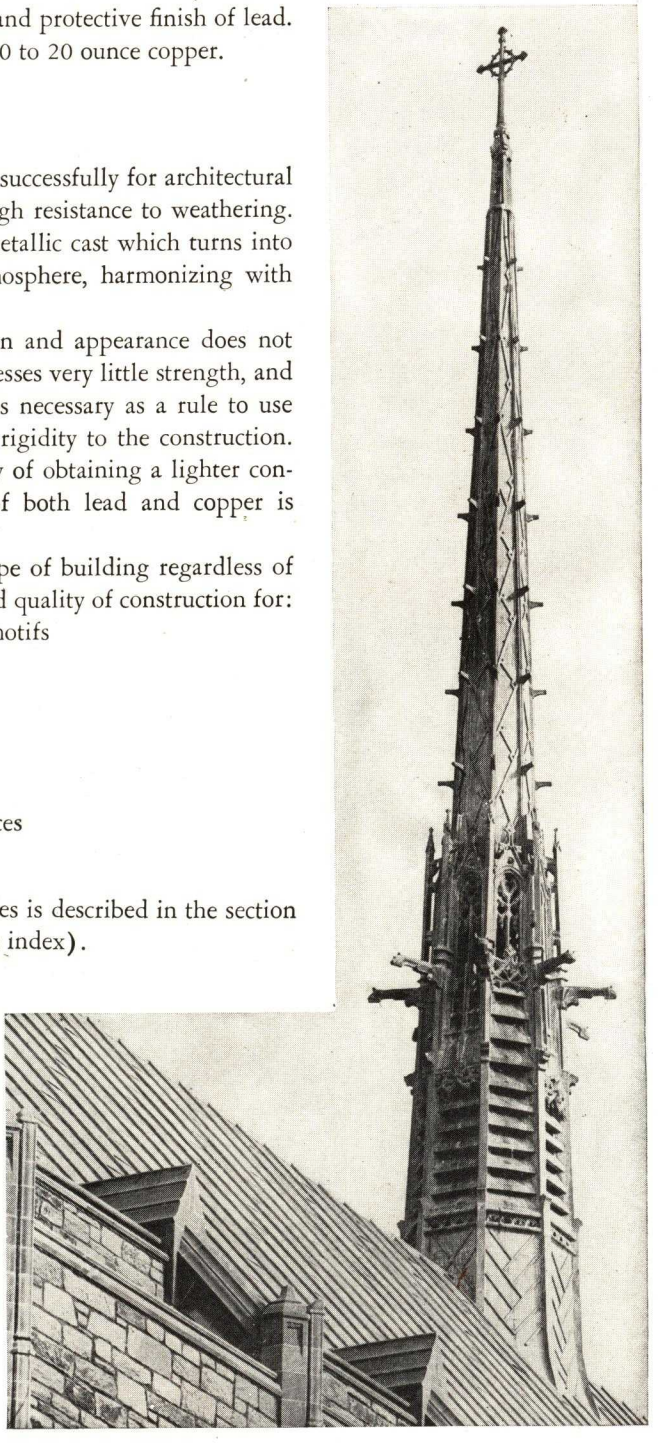
Leadtex can be used in practically any type of building regardless of architectural style. It ensures permanence and quality of construction for:

Roofing	Ornamental motifs
Flashings	Domes
Gutters	Turrets
Leaders	Skylights
Leader heads	Crestings
Cornices	Marquises
Spandrels	Panels
Store fronts	Curved Surfaces
Balustrades	Thru-Wall Flashing
Dormers	

The use of Leadtex for decorative purposes is described in the section on Architectural Sheets and Shapes (see file index).



An attractive Lead Coated Copper porch roof of standing seam construction adds to the appearance of this residence



Ornamental Fletche and Batten Seam Roof of Leadtex, Metropolitan M.E. Church, Washington, D. C. 20,000 pounds of Revere Leadtex were used on this job. Sundt and Wenner, Architects. Stofflet and Tillotson, General Building Contractor. Chew-Bittel Company, Sheet Metal Contractor — all of Philadelphia, Pa.

SPECIAL ADVANTAGES OF LEADTEX

THE FINISH Is similar to lead as far as weathering and lasting qualities are concerned.

STIFFNESS On account of the additional strength and stiffness given by the copper, Leadtex can be used in the same manner and for the same purpose that copper has always been used.

LIGHTWEIGHT Because of its lightness as compared to sheet lead, the construction weight of roofs, domes, spandrels, ornamental motifs and the like, may be greatly reduced.

This is an important consideration in modern building construction. The use of Leadtex for spandrels is very well illustrated in the photographs of spandrel panels on page 25.

NON-STAINING The lead coating prevents the staining of other adjacent building materials through the action of the elements, which on exposed copper sometimes causes a green stain. This is likely to occur particularly when the material is in the proximity of salt water or where it is exposed to the action of sulphur fumes from smoke. Under such conditions it is recommended that Leadtex be used as flashing, if in contact with stone, marble, stucco, or cement work.

RELIEF AND ORNAMENT The properties of copper which make it possible to stamp or form it readily with faithful reproduction of detail is improved by the lead coating of Leadtex. This makes Leadtex especially adaptable to ornamental constructions.

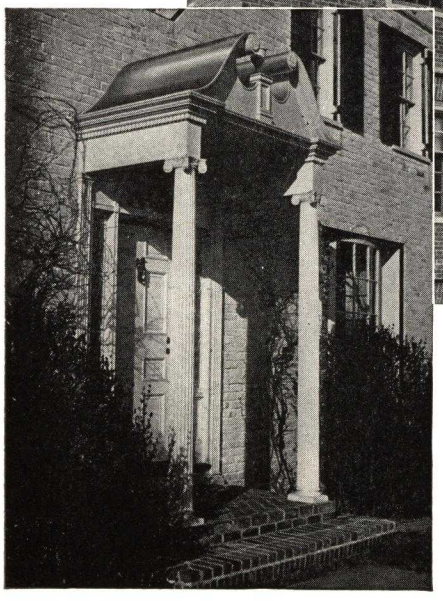
COLOR The natural color of Leadtex is a soft, neutral tone which harmonizes well with almost any material and color scheme. It ages beautifully, weathering to a dark antique gray. Where it is desired to have the dark tone from the first, it may be produced by chemical treatment.

COST Of real importance to the architect is the fact that Leadtex costs but little more than plain sheet copper.

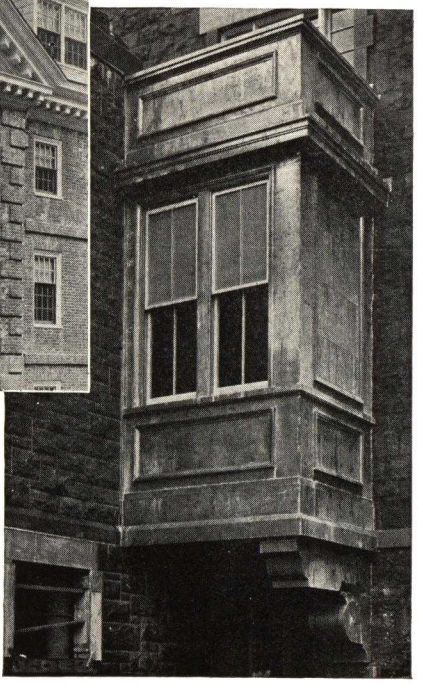
READILY AVAILABLE Leadtex is distributed throughout the country and is readily and quickly obtained by the sheet metal trade through authorized distributors of Revere products. Samples of Leadtex in its various finishes will be sent gladly to any architect.

We will also assist architects with all problems they may have regarding special details or applications of Leadtex. Our nearest office will answer any communications concerning this or other Revere products.

Below: Leadtex was used extensively in the restoration of St. Michael's Passionist Church of Union City, N. J. Schreck and Waelty Inc., Jersey City, N. J., Sheet Metal Contractor



Above: Dentils and Cornice of Leadtex A.A.A. on the men's dormitory at Massachusetts State College, Amhurst, Mass. Lewis W. Ross, Boston, Mass., Architect; Hampden Cornice Works, Springfield, Mass., Sheet Metal and Roofing Contractor



Left: Lead Coated Copper was particularly suitable for the roof of this broken pediment as it gives the effect of sheet lead used on older examples

TYPES OF LEADTEX

Revere, which has been a pioneer in the production of lead-coated copper now offers for sale three types known as Leadtex "15" and Leadtex "25" and Leadtex AAA. The first two are new types which are decided improvements in quality over all previous types of lead-coated copper regardless of manufacture.

The quality of lead-coated copper depends almost exclusively upon the uniformity of the lead coating and the bonding of the lead to the copper.

In Revere's new Leadtex, the lead is applied uniformly to the copper sheet and a perfect bond is obtained. Extensive laboratory tests and accelerated corrosion tests indicate the marked superiority of Leadtex "15" and Leadtex "25" for both architectural and industrial uses.

IDENTIFICATION Every sheet of Leadtex is marked with the Revere Red, White and Blue label indicating weight of coating and base and type of finish.

LEADTEX "15"

Leadtex "15" has quite a smooth surface yet there is sufficient texture to make it architecturally attractive. It can be used for roofs, eaves troughs, leaders, etc., and for decorative purposes when embossed designs are not required in extremely fine detail. It can be painted, when design requires, without special cleaning or priming coats which cuts painting costs.

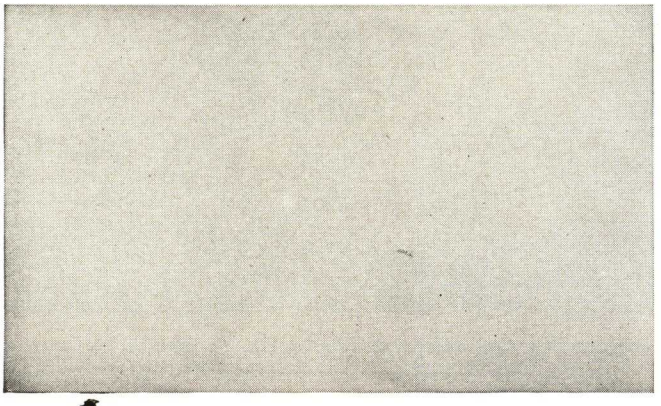
WEIGHTS Leadtex "15" is furnished coated both sides with a coating of 7½ pounds of lead per 100 square feet per side or 15 pounds per 100 square feet if coated both sides. The base may be 10 to 20 ounce copper in either hard or soft temper.

LEADTEX "25"

Leadtex "25" has a rougher surface than Leadtex "15" but the finish is unusually smooth and uniform considering the thickness of the coating. The texture is pleasing and has no resemblance to mechanically produced textures. It fits in with all types of rugged designs but is more limited than Leadtex "15" and AAA where embossed detail is required.

WEIGHTS Leadtex "25" is furnished coated both sides with a coating of 12½ pounds of lead per 100 square feet per side or 25 pounds per 100 square feet if coated both sides. The base may be 10 to 20 ounce copper in either hard or soft temper.

LEADTEX AAA



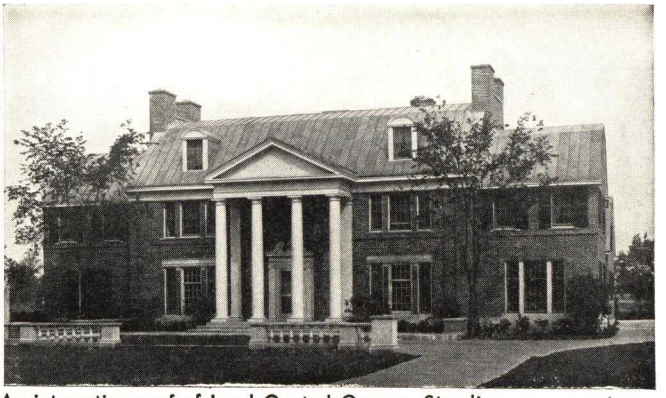
Leadtex AAA has a smooth surface in which the lead is uniformly distributed. It is recommended for flashings, roofing and ornamental stampings where the texture is not important; where for the sake of design the metal must be painted, Leadtex AAA usually is specified. The surface takes lead and oil paint perfectly and no priming is necessary.

WEIGHTS Leadtex AAA is coated on one side only unless otherwise specified. The weight of coating may be 7½ to 12½ pounds per square foot per side on a base of 10 to 20 ounce copper with either hard or soft temper.

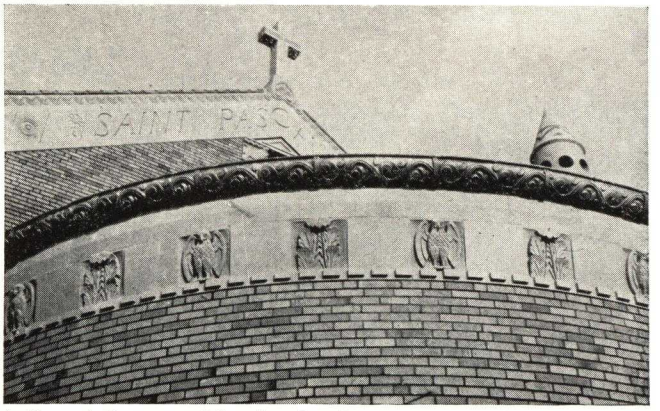
LEADTEX FOR ROOFING, FLASHING, ETC.

Since Leadtex is produced with a copper base, it retains all the properties which make copper such a widely used construction material. In addition it offers the soft tones of lead which harmonize so well with a variety of building materials. Structurally Leadtex can be considered wherever copper is used and its application is essentially the same. Reference should be made to the pages indicated below for further information on specific applications. A few differences in the handling of Leadtex are noted on page 26.

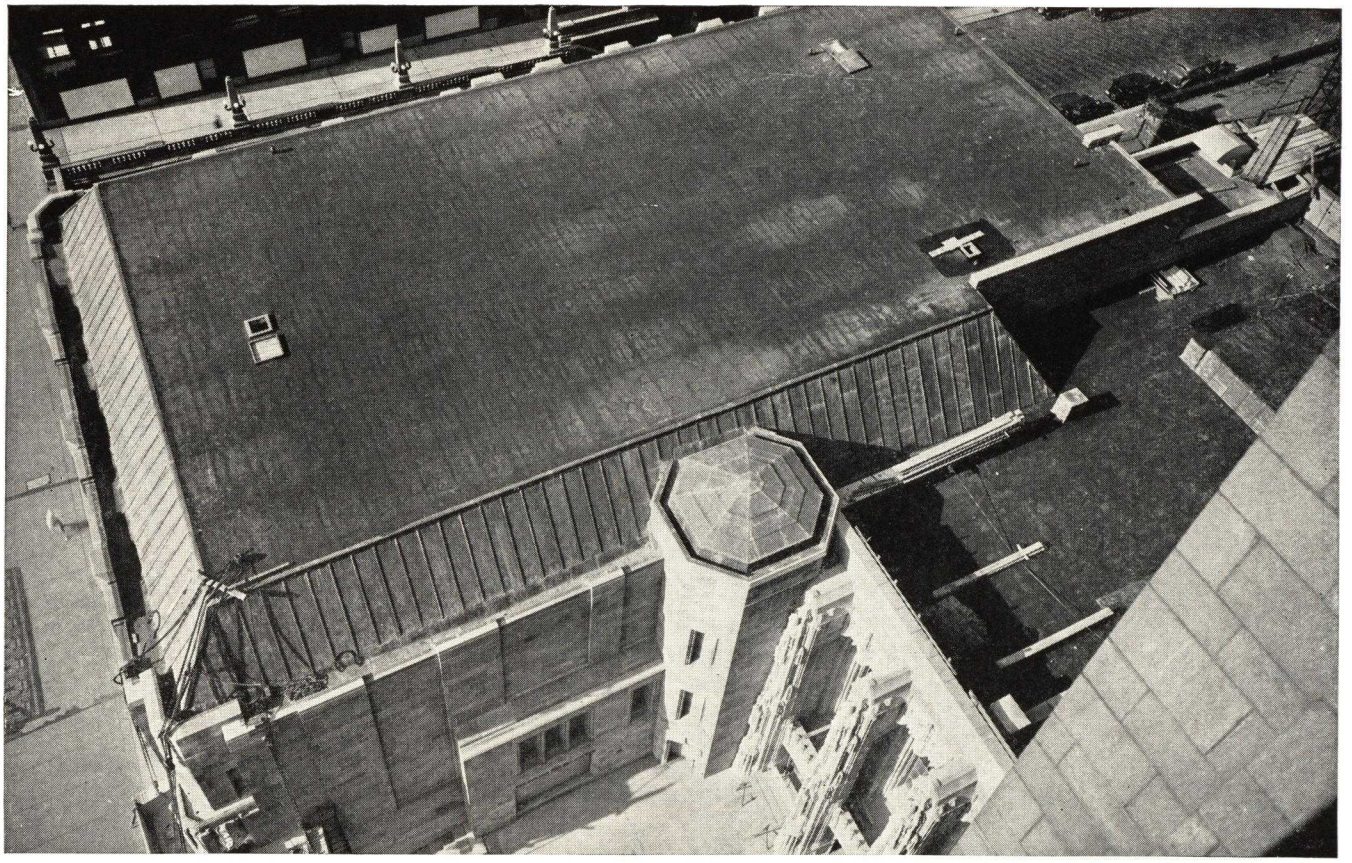
	Page
Standing Seam Roofs	5-7
Flat Seam Roofs	8-10
Batten Seam Roofs	11-13
Spires, Domes and Towers	18
Gutters and Leaders	16-17
Thru-Wall Flashing	33-38
Spandrel Waterproofing	39
Specifications	27
Decorative Uses— See Catalog on Architectural Sheets and Shapes	



An interesting roof of Lead Coated Copper. Standing seam construction throughout

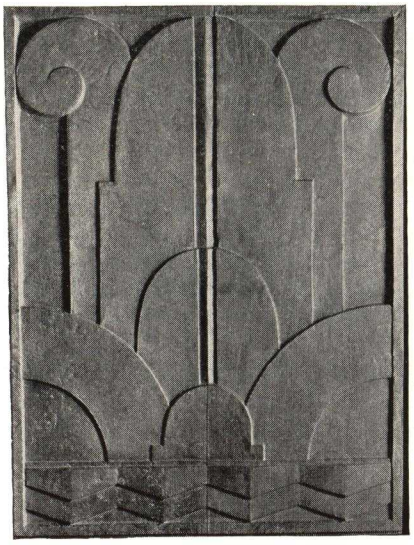


A Curved Ornamental Leadtex Leader, St. Pascal's Church, Chicago, Ill. B. J. Hutton, Architect; Raymond Gregori, Associate; Wagner Bros. Cornice Co., Chicago, Sheet Metal Work; Friedley-Voshardt Co., Chicago, Stamping



WGN Broadcasting Studio, Chicago, Ill. 16 oz. Leadtex was used for mansard roof, gutters and turret. John M. Howells, Hood & Fouilhoux, New York City, Architect; L. J. Weissenborn, Chicago, Associate Architect; R. C. Weiboldt Company, Chicago, General Contractor; L. H. Sohn Company, Chicago, Sheet Metal Contractor

LEADTEX SPANDRELS



Leadtex Spandrel, Pellissier Building, Los Angeles, California. G. Albert Lansburgh, San Francisco, Cal., and Morgan, Walls & Clements, Los Angeles, Cal., Architects; Stampings by Los Angeles Cornice & Stamping Works, Los Angeles, Cal.; Installation by National Cornice Works, Los Angeles, Cal.

Lead Coated Copper Spandrel used on the Eastern Outfitting Building, Los Angeles, California. Claude Beekman, Architect; Los Angeles Cornice Works, Stamping and Sheet Metal Work

Leadtex Spandrels, Hunter-Dulin Building, San Francisco, California. Shultze & Weaver, Architects, New York; Stampings and Installation by Forderer Cornice Works, San Francisco Cal.

Spandrels vary in size and method of construction, as well as in the gauge of Leadtex used, depending on the nature of the work in hand. There is also a wide latitude in practice as to method of framing and connecting unit parts, as well as anchoring or securing them in place.

Because of the variety of design of spandrels, etc., specifications will depend on the conditions of each installation.

Leadtex can also be used with Macotta Spandrels.

Leadtex Spandrels, Hunter-Dulin Building, San Francisco, California. Shultze & Weaver, Architects, New York; Stampings and Installation by Forderer Cornice Works, San Francisco, Cal.

These Revere Leadtex Spandrels are Three of the Five Designs Used in 512 Spandrels on William Taylor Hotel, San Francisco, California. They illustrate clearly the depth of the relief and the delicacy of detail with Leadtex. Lewis P. Hobart, Architect; Cahill Bros., General Contractors; Fabricated and installed by Forderer Cornice Works, all of San Francisco, Cal.

APPLICATION OF LEADTEX

In general, the method of applying Leadtex for roofing and other sheet metal work is the same as for plain sheet copper. Reference should be made to other sections of the handbook where application details will be found.

In selecting Leadtex the weight of the copper base should be the same as for uncoated material for similar uses. For roofing 16 ounces is usually considered the minimum and occasionally it is advisable to use a heavier weight. Leadtex may be obtained in either soft or hard temper and the selection between these two tempers should be on the same basis as for plain copper.

In actual use lead-coated copper sheets should be handled with care. Lead being a soft material, scratches and cuts easily and careful handling is necessary to prevent deep scratches or cuts that might possibly become the focal points of corrosive attacks.

Particular care must also be exercised in soldering. Neutral fluxes of the zinc chloride types are recommended. Either liquid or paste fluxes may be used. As a general rule, the paste flux is preferable, because it may be carefully applied with a brush and the tendency to swab on excessive amounts, which is always present when liquid fluxes are employed, is eliminated.

In the actual soldering operation, it is essential that the solder seams are well covered with the coating metal or with solder. A non-acid solder should be used.

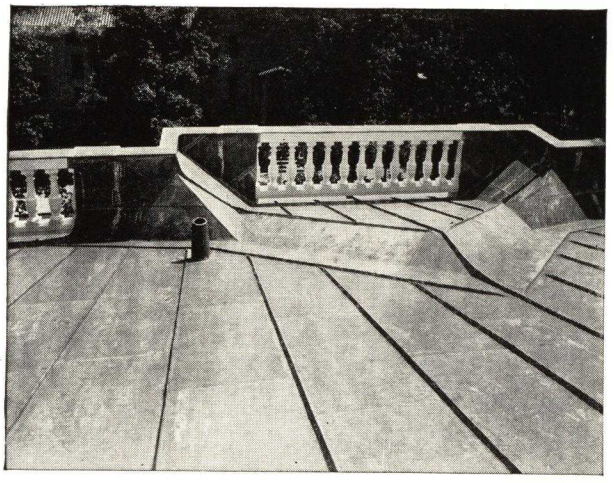
TO SPECIFY LEADTEX

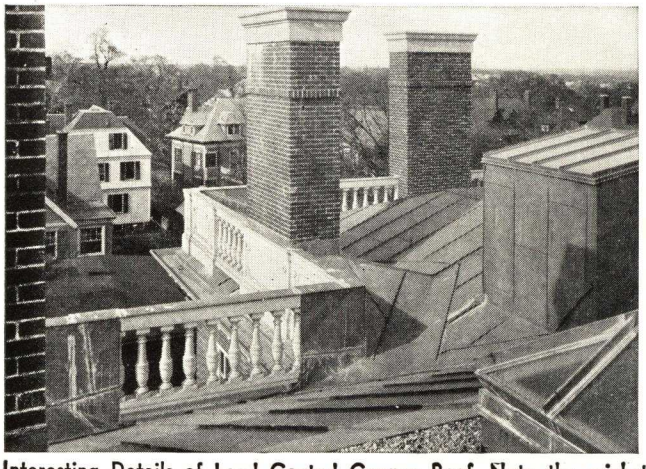
Specify Leadtex in the same weights and temper ordinarily used for copper, denoting the weight of lead coating as given on page 23. In many cases the specifications for sheet copper may be adapted to Leadtex by using the material specification given below. See page 27 for roofing specification.

"All . . . shall be 16 ounce (or other weights) hard (or soft) copper base, Revere Leadtex "15" or "25" or AAA."

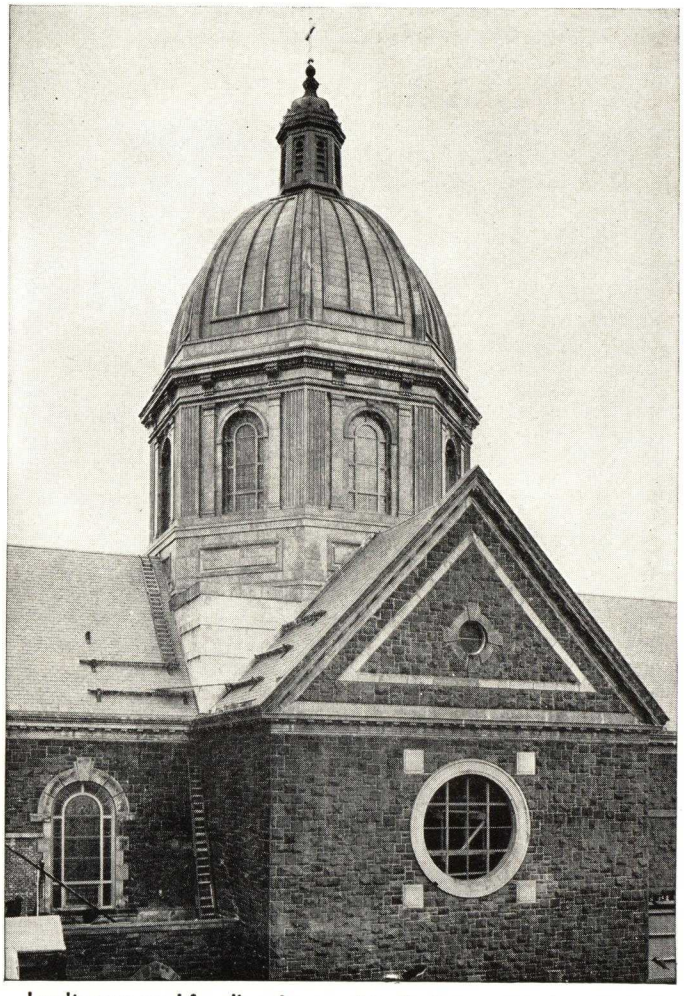
IDENTIFICATION

Every sheet of Leadtex is marked with the Revere Red, White and Blue label indicating weight of coating and base and type of finish.





Interesting Details of Lead Coated Copper Roof. Note the cricket valleys, gutters and balustrade and chimney flashings. Standing seam construction throughout



Leadtex was used for all roofing needs in the restoration of St. Michael's Passionist Church, Union City, New Jersey. Schreck and Waelty Inc., Jersey City, New Jersey

ROOFING SPECIFICATIONS

It would hardly seem necessary to stress the importance of proper and adequate specifications. The proper application of all materials in building construction is essential and this applies to copper as well as to the other materials. The specifications are the means of accomplishing this, and very often they are too meagre. They should be sufficiently detailed to cover every point of application, materials and workmanship accurately, and to permit of only the one proper interpretation of the detailed drawings.

As a safeguard to all the parties involved completeness in the specifications will go a long way toward insuring uniform bids and preventing unscrupulous contractors from taking advantage of inadequate specifications to underbid reliable firms by cutting on material and workmanship.

It is further urged that the specifications or the general contractors ask sheet metal contractors to include in their bids the total number of square feet and total weight of the copper to be used. This will largely eliminate misinterpretation of specifications. The weight of metal can readily be compared with the number of square feet within the tolerance limits, to ascertain that the correct weight sheets are to be used. The number of square feet offers an easy way to compare the different contractors' interpretations of the specifications.

STANDARD SPECIFICATIONS FOR SHEET-COPPER WORK

(Covering in Detail Roofing, Flashings, Roof-Drainage, etc.)

Notes

(a) It should be noted that, wherever in this long specification Alternate Methods of doing work are described, they are designated by letter in order of recommended practice. In every case the first listed (letter A) describes recommended best practice.

(b) Different Methods for different kinds of construction are collected under one general heading and sub-numbered 1, 2, 3, etc.

(c) The arrangement of subjects has been made to agree, as nearly as possible, with the usual arrangement of sheetmetal specifications for the average building.

(d) **When it is desired to write a short specification to cover all the Sheet Copper Work on a building Item 1 alone may be used. There should then be a definite understanding between the contracting parties about Alternate Methods.**

---

1. SHEET-COPPER WORK

Unless otherwise particularly specified, all sheetmetal work and all material and labor in connection therewith shall be furnished and performed in strict compliance with the recommended practice and Standard Specifications for Sheet-Copper Work of the Copper & Brass Research Association, 420 Lexington Ave., New York.

2. GENERAL

The General Conditions of the contract are hereby made a part of the contract and this contractor shall examine these General Conditions and thoroughly acquaint himself with all the requirements therein contained.

3. SCOPE OF WORK

Except as otherwise specified this contract includes the furnishing of all labor and materials necessary to complete in every respect, in accordance with the best practice, all the Sheet-Copper work of every description for this building.

4. GUARANTEE

Before final payment the contractor shall give to the owner a written guarantee which shall specify the kind, weight and manufacturer of the materials used, and shall guarantee his work free from all defects of workmanship for a period of two years after completion and shall make good all defects and all damage to the building from leaks during that time. If so directed by the architect this contractor shall execute a proper guarantee bond.

5. CONTRACTOR TO EXAMINE SURFACES

This contractor shall carefully examine all surfaces prepared for flashings, etc., by other trades, shall point out all defects, and shall see that the necessary corrections are made before proceeding with his work.

This contractor shall arrange his work so as to cooperate at all times with other trades and prevent delay or damage to other work.

6. PRECAUTIONS AGAINST DAMAGE DURING CONSTRUCTION

During construction care shall be taken to prevent damage to sheet-copper work in place by walking or placing heavy materials thereon. As soon as soldering is done, the work shall be thoroughly cleaned. Toward completion, all damaged work shall be repaired, shall have all stains and debris removed, and shall be left in perfect condition.

7. PREPARATION OF SURFACES (OTHER CONTRACTORS)

All surfaces to receive flashings shall be made smooth and even, and free from all small projections or hollows, and all nail heads shall be set.

8. BUILDING PAPER

Before laying copper all surfaces shall be covered with building paper or roofing felt of approved quality, weighing not less than 6 pounds per 100 square feet (i.e. 30 pounds per standard roll of 500 square feet). Paper shall lap 2 inches and be nailed with large flat-head copper nails.

9. SHEATHING (CARPENTERS' SPECIFICATION)

All sheathing upon which sheet copper is to be laid shall be of straight, unwarped boards, free from splits and knot holes. All joints shall be true and even. All nail heads shall be set. All uneven edges of boards shall be smoothed off to give a firm, even surface.

Notice shall be given to the roofing contractor when the sheathing is laid and an inspection shall be made by him. All defects observed at this inspection shall be corrected promptly.

10. WOOD SHEATHING

All wood sheathing shall be absolutely dry and sound when copper is applied. The lumber shall be (A) kiln-dried; (B) air-dried.

11. CONCRETE (MASONS' SPECIFICATION)

All concrete surfaces to be covered with copper shall be made smooth and even with a wash of neat cement. Where cinders have been used in the concrete it shall be painted with two heavy coats of asphalt paint.

Where required, provision shall be made for securing copper work by means of (1) nailing into (A) nailing concrete; (B) embedded wooden battens or (2) expansion bolts.

12. GYPSUM (MANUFACTURERS' SPECIFICATIONS)

Gypsum surfaces to receive sheet copper shall be well-laid, smooth and even. Where nailing is required the gypsum shall be provided of sufficient thickness to allow a 2-inch penetration of copper alloy nails.

13. MISCELLANEOUS LAYING SURFACES (MANUFACTURERS' OR MASONS' SPECIFICATION)

Where copper is to be laid on or against terra-cotta, stone, brick or stucco the surfaces shall be made smooth and even with a wash of neat cement or two coats of heavy asphalt paint. Required provision shall be made for proper fastening.

14. SOFT (ROOFING TEMPER) COPPER. HARD (CORNICE TEMPER) COPPER

Except as otherwise specified, all copper throughout the work shall be of 16-oz., soft (roofing temper) copper sheets.

All leaders, eaves troughs, molded hanging gutters, and other formed parts as specified, shall be of 16-oz., hard (cornice temper) copper.

15. LEAD-COATED COPPER

Except as otherwise specified all lead-coated copper shall consist of 16-oz. soft (roofing temper) Revere Leadtex. The exact weight, texture, and tone of the lead coating on each side of the sheet shall be as specified by the architect, in accordance with Specification B-101 of the American Society of Testing Materials.

16. CRIMPED COPPER

Where specified copper sheets shall be used which have been crimped by passage through heavy rolls to form ridges about $\frac{7}{32}$-inch center to center in the direction of the short dimension.

17. CORRUGATED COPPER

Where called for on the drawings corrugated copper of the form and gage specified shall be used. The form and size of the corrugations shall be clearly and completely defined by means of dimensions.

18. SOLDER

All solder shall be of the best grade, equal to Specification B-32 of the American Society for Testing Materials, and shall be composed of one-half pig lead and one-half block tin (new metals).

19. FLUX

Rosin shall be used as a flux.

In exceptional cases where acid flux must be used it shall be thoroughly "killed" with zinc before being applied to the copper. After soldering with acid flux the entire work shall be thoroughly washed with a solution of soap and 5% to 10% washing soda.

20. TINNING

The edges of all sheets to be soldered shall be tinned 1½" on both sides with pure tin or solder. Rosin shall be used as a flux.

21. SEAMS

Standing seams shall finish not less than 1" high unless particularly specified otherwise.

Flat-lock seams shall finish not less than ½" wide.

Lap seams where soldered and subject to stress, shall finish not less than 1" wide.

Lap seams, where soldered and not subject to stress, shall finish not less than ½" wide.

Lap seams not soldered shall lap according to the pitch but not less than 3".

Double or copper-lock seams shall finish not less than ½" wide.

All flat and lap seams shall be made in the direction of the flow.

22. LOOSE-LOCK SEAMS

Loose-lock seams shall be provided as specified and shall be so formed and located as to preclude leakage.

23. EXPOSED EDGES

The exposed edges of all flashings shall be doubled back ½" in such manner as to conceal them from view and to provide stiffness.

24. EXPANSION JOINTS

Expansion joints of the size and type indicated shall be provided as called for in the drawings.

Such joints shall be placed:

(-1) Every 25' to 50' in continuous copper lined gutters, cornices, etc.

(-2) In conjunction with building expansion joints.

25. WHITE LEAD

Where specified seams shall be caulked with white lead paste made up of basic lead carbonate, conforming to specification D81-34 of the American Society for Testing Materials, and boiled linseed oil. The oil shall make up 8% of the paste which shall be smooth, free from lumps, and of a putty-like consistency.

26. NAILS AND FASTENINGS

All nails, rivets, screws and similar fastenings shall be of best grade hard copper or copper alloy.

Nails for wood sheathing and nailing concrete shall be wire nails not less than No. 12 gage and not less than ⅜" long.

Nails for precast or poured gypsum shall be not less than No. 9 gage and not less than 2" long.

27. CLEATING AND FASTENING

All sheets over 12" wide shall be fastened by cleats 2" wide and about 3" long, spaced as specified elsewhere. They shall be secured to the roof by two nails set about ¾" from the end and shall have the end turned back ½" over the nail heads. The free end of the cleat shall be turned over to engage the edge of the sheet and shall be locked into the seam. Where seams are soldered cleats shall be tinned. Except as otherwise specified cleats shall be spaced not more than 12" apart.

Sheets less than 12" wide shall be secured by nails spaced as specified for different types of flashings.

Where flashings are nailed the nailing shall be restricted to one edge only. Nails shall be near the edge and shall be evenly spaced not more than 4" apart, unless otherwise specified.

Where copper is laid on concrete or gypsum roof slabs the roofing contractor shall prepare detailed instructions, with drawings, etc., for locating all fastenings for cleats, edge- and eaves-strips, flashings, etc.

28. FASTENINGS FOR COPPER ROOFING (MASONS' SPECIFICATION)

In all concrete or gypsum roof slabs which are to be covered with copper roofing or flashing, set fastenings for cleats, edge- and eaves-strips, etc., as located by the sheet-metal contractor. Fastenings shall consist of (1) 2" x 2" nailing strips placed in the roof slab flush with surface; (2) wood grounds placed in the roof slab at eaves, etc.; (3) expansion inserts to receive nails or screws.

Before the roof slabs are poured this contractor shall obtain from the sheet-metal contractor complete instructions, with drawings, for locating fastenings.

29. RIBBED (BATTEN) SEAM ROOFING

Wood or copper alloy ribs of the shape and dimensions indicated shall be set under another contract to the spacing shown on the drawings. The roofing contractor shall see that these are well secured with all nails well set, bolts or nuts countersunk, truly lined and evenly spaced, and shall not proceed until all faults have been corrected.

In general sheets shall be 96" long and shall be laid with cross seams staggered. They shall be fastened by cleats not over 12" apart and secured to sides of wood ribs. The cleats shall be locked to the sheets and the ribs shall be covered with a flashing cap locked over the cleats and edges of sheets on both sides.

All cross seams shall be flat-lock, and (1) unsoldered; (2) filled with white lead; (3) thoroughly sweated with solder, as specified under "Soldering." They shall be secured by cleats.

30. BATTENS OR RIBS FOR COPPER ROOFING (CARPENTERS' SPECIFICATION)

Where indicated on the drawings place on the roof sheathing wood battens or ribs shaped as detailed. The spacing of these ribs is approximately .... inches. The exact spacing shall be determined by the architect, and this contractor shall use a templet or gage-board to insure proper lining and spacing. They shall be firmly nailed with all nail heads set.

31. STANDING SEAM ROOFING

Seams shall be spaced as shown on the drawings.

All sheets shall be, in general, full length. They shall be laid with long edges turned up to form standing seams, and shall be secured by cleats not over 12" apart. No solder shall be used on standing seams. Cross seams shall be staggered.

All cross seams shall be flat-locked, and shall be, as indicated on drawings, (1) unsoldered. (2) filled with white lead; (3) soldered as specified under "Soldering." They shall be secured by cleats.

32. FLAT SEAM ROOFING

The roofing shall be applied the narrow way, joints staggered, using sheets not larger than 14" x 20".

All sheets shall be properly clipped and bent to form flat seams. Each sheet shall be secured to the roof with 2" x 3" copper cleats evenly distributed along the edges of each sheet, two on the long side, one on the short.

(-1) All sheets to be soldered shall be tinned all around and on both sides twice the width of the lock seam to be used.

(-2) Where white lead is used in the seams tinning shall be omitted.

33. CORRUGATED COPPER ROOFING AND SIDING

Corrugated copper sheets shall have a side lap of at least one corrugation for siding and 1½ or 2 corrugations for roofing. End laps of sheets shall be at least 3" for siding and 6" for roofing.

All fastenings shall be of copper or copper alloy, and for roofing sheets they shall be applied through the high points of the corrugations.

When laid on steel purlins, the steel shall be insulated from the copper sheets by (A) asbestos strips, (B) lead strips or washers, (C) heavy asphalt paint over steel, (D) heavy tinning of steel.

34. SIZE OF SHEETS

(-1) Strip copper shall be used for all flashings up to 18" in width.

(-2) In general, flashings for flat surfaces such as decks, crickets, etc., shall be of sheets not larger than 14" x 20". Under special conditions larger sheets may be used with the architect's approval.

(-3) All built-up and lined gutters shall be flashed with sheets of size specified under "Built-in Gutters." (See paragraph 51.)

35. BASE FLASHINGS

(-1) Unless otherwise specified or shown on the drawings, base flash-

ings shall be, in general, at least 6″ high, and shall project at least 4″ out on the roof. On sloping roofs they shall lap longitudinally at least 3″. On flat roofs the joints shall be flat-locked and soldered.

(-2) Against stucco-coated walls, the metal lath shall lap outside the flashing so that the stucco shall finish over the flashing.

36. CAP FLASHINGS OR COUNTER-FLASHINGS

Cap flashings shall turn down over base flashings not less than 4″, and shall have bottom edges turned back ½″. They shall be secured to vertical surfaces as follows:

(-1) Wood Work. They shall extend up under exterior coverings such as shingles, slate, etc., at least 2″ above the butt of the second course, and in no case less than 4″ above the roof.

(-2) Masonry Work. For Thru-Wall Flashing see specifications given on page 41 of this catalog.

(-3) Reglets. They shall be secured, as specified below, in reglets cut in the masonry.

(-4) Stucco on Wood. When used with stucco-covered wood-frame walls, cap flashings shall be formed over a ⅞″ base board and extend up the wall at least 2″ above the base board, and be nailed at the top edge with nails about 8″ apart. Metal lath shall be placed over the flashing and the stucco shall be finished against the base board.

(-5) Stucco on Masonry. They shall be built into the masonry as the work progresses and shall project out from the wall as required and turn down over the base flashing. The stucco shall finish against the cap flashing.

(-6) Concrete Walls. They shall be set in the forms before the concrete is poured. They shall extend into the wall at least 2″ and shall have the inner edges turned back ½″.

37. FLASHINGS FOR CLAY AND CEMENT ROOF TILE

Flashings shall be laid as specified elsewhere for base, cap, and continuous flashings. All base flashings running with the length of the tile shall extend out on the roof under the tile as far as possible without puncture by nails, and shall be formed into a trough by turning up the edge 90°. So far as possible flashings shall be laid to avoid sharp bends and angles, and shall not be nailed. They shall be held in place by the weight of the tile or by cleats. The manufacturer's specifications shall be followed for flashings of special shapes, etc.

Where vent-pipes occur the tiles broken by the pipes shall be bedded in mortar or secured with nails and covered with the flashing. Flashings shall extend down the roof to the end of the tile, out on the sides to the first lock or trough, and up the roof to and over the wood battens or to the nails securing the tiles.

Valley flashings shall be formed to fit the type of tile used and shall extend up the sides of the intersecting slopes, or be turned over the supporting wood battens, to form a valley at least 4″ deep.

Flashings against the sides of dormers, etc., on sloping roofs shall continue as a trough under the tile and discharge out on top of the tile below or into the gutter.

Exposed flashings shall extend with the length of the tiles at least 6″ and shall be formed over them. Those extending crosswise shall terminate in depressions or locks and be held in place by the adjoining tiles or by cleats.

38. FLASHINGS FOR BUILT-UP ROOFING (ROOFERS' SPECIFICATION

When used with built-up roofing base flashings shall be not less than 5″ high and extend at least 6″ out on the roof, in accordance with Specification No. 156 of the Federal Specification Board for the Installation of Metal Flashings with Bituminous Built-up Roofings.

Cap-flashings shall be installed by the Sheet-Metal Contractor as specified elsewhere. The Roofing Contractor shall read carefully the sheet-metal specifications.

39. FLASHINGS FOR TERRA-COTTA

Where indicated on the drawings terra-cotta shall be flashed to make a water-tight job. The top surfaces of all projections such as the washes of cornices, where the wash is formed of more than one piece, shall be completely flashed, and where so shown on the drawing all deck projections shall be so flashed.

Flashings shall be secured to the outer edge of terra-cotta projections by forming around a rolled nosing or bull-nose formed in the terra-cotta, or by brass screws set with lead sleeves into holes formed in the terra-cotta. The screws shall be set through washers and shall be soldered to the sheet. The sheet so secured shall extend down below the edge of the terra-cotta not more than ⅜″ to form a drip.

Cornices, band cornices, gutters, etc., formed in terra-cotta, or masonry faced with terra-cotta, shall have a continuous flashing running from the outside edge up to and behind the cap flashings.

Cap flashings shall be built in behind the terra-cotta facing above all cornices, etc. They shall extend up the wall at least 3″ and shall lap the cornice flashing 4″.

Balconies with balustrades shall have continuous flashings running from under the door or window sills through the balustrades and to the outside edge of the projection. Flashings shall be formed with flat-locked or lapped seams well soldered. Large areas shall be covered as in flat seam roofing.

Around column bases, etc., flashings shall be turned up and into a reglet formed in the terra-cotta, or into the first joint of the terra-cotta facing in such a manner as to make a water-stop.

Where rods, etc., necessary to support terra-cotta balustrades or other architectural members, penetrate the flashings, the joint shall be made watertight as follows: The rods being in place, the flashing pieces shall be marked, punctured and set in position by sliding down over the rods; or, if this method is impracticable, the sheet may be slit to allow them to be slid into place. The slit shall be made tight by soldering a strip over it. Cups or thimbles, conforming roughly to the shape of the rod or bar then shall be placed over the rods and soldered to the sheet. They shall be at least 1″ larger all around than the rods. The cups shall then be filled with mortar or an approved waterproofing-compound.

40. TERRA-COTTA (MANUFACTURERS' SPECIFICATION)

(-A) *Edges of all top pieces of projections to be flashed shall have formed on the vertical face holes about 9″ apart, ⅜″ in diameter, and at least ¾″ deep, for fastening the flashings.*

(-B) *All edges to receive flashings shall have a rounded nosing around which the flashing sheet may be hooked and held firmly.*

Where indicated on the drawings or directed by the architect, holes shall be formed in the terra-cotta for securing flashing cleats. They shall be spaced about 12″ apart.

41. HIPS AND RIDGE FLASHINGS

(-1) Install hip and ridge flashings over roofing or battens set by other contractors. They shall be secured on either side of the roll by round-head brass wood-screws about 12″ apart, set through washers. Holes in the roof covering shall be drilled. The heads of the screws and washers shall be covered with copper caps soldered to the flashing.

(-2) Hip and ridge rolls of design shown shall be installed over battens, etc., set by other contractors. The apron shall be held down by $\frac{3}{16}$″ x 1″ brass bands 30″ apart, secured to the batten by brass wood screws through countersunk holes.

42. OPEN VALLEY FLASHINGS

(-1) Open valleys shall be not less than 4″ wide. The proper width shall be determined by the following rule: Starting at the top with a widh of 4″, increase the width 1″ for every 8′ of length of valley. Flashing pieces shall be full length sheets, and of sufficient width to cover the open portion of the valley and extend up under the roof covering not less than 4″ on each side. The sheets shall not be punctured with nails.

There shall be no longitudinal seams in open valley flashings. The cross seams at the ends of sheets shall be lapped according to the pitch or locked and soldered. Edges shall be turned back ½″ and held in place by cleats spaced not more than 12″ apart and nailed to the sheathing with two copper or copper alloy nails.

(-2) "Fold-over" Flashings shall be used, of such design as to allow not less than 3″ beyond the fold to be covered by the roofing. They shall be secured by cleats not more than 12″ apart.

(-3) Where two valleys of unequal size come together, or where the areas drained by the valley are unequal, there shall be placed in the valley a "crimp," angle, or Tee not less than 1″ high. This may be formed in the valley sheet before placing, or it may be made of a separate piece soldered to the valley sheet.

43. CLOSED VALLEY FLASHINGS

(-1) Built-In Method. Flashing pieces for closed valleys shall be of sufficient lengh to extend to or above the top of the roofing piece and lap the flashing piece below 3″, and of width sufficient to extend up the sides of the valley far enough to make the valley 4″ deep. They shall be placed with the roofing so that all pieces are separated by a course of shingles or slate. Pieces shall be set so as to lap at least 3″ and to be concealed entirely by the roof covering. They shall be fastened by nails at the top edge only, or hooked over the top of the underlying shingles.

(-2) Large Piece Method. Before the roof covering is laid this contractor shall place in all valleys long strips of copper of sufficient width to make a trough at least 4″ deep. These strips shall be laid from bottom to top of the valley with a 4″ lap, unsoldered. Where such strips are not over 12″ wide they shall be fastened with nails spaced every 18″ along the outer edge. Strips over 12″ wide shall be fastened by 2″ cleats, spaced overy 30″.

(-3) All closed valley flashings shall be made with a "crimp" or ridge down the center equal to the full thickness of the roof-covering courses.

44. CHANGES OF SLOPE

All changes of slope in shingle roofs shall be flashed with copper.

(-1) Exposed Flashings. On the upper slope the flashing shall ex-

tend as far as possible without being punctured by nails, and cleated, and on the lower slope it shall extend at least 3″ over the shingles.

(-2) CONCEALED FLASHINGS. On the upper slope the construction shall be the same as for exposed flashings. On the lower slope the flashing sheet shall be carried down between the shingles of the double course to within ½″ of the butts. These shingles shall be fastened with countersunk brass screws passing through lead washers over the flashing.

45. FINISHES AT WALLS

All joints between roofing and walls shall be flashed with copper, and unless otherwise specified flashings shall be cap and base, or through wall flashings.

SHINGLE ROOFS. Flashing shall be by means of cap and base, or through wall flashings as specified elsewhere, or a concealed flashing. The concealed flashing shall be in one piece forming a concealed gutter at least 3″ wide and carried under the roofing at least 4″. It shall be secured to the wall as specified for cap flashings.

TILE ROOFS. Flashings shall be as specified elsewhere.

COMPOSITION ROOFS. Flashings for composition or laminated roofs shall be as specified elsewhere for Built-up roofing.

46. WALL FLASHINGS

Where called for in the specifications or shown on drawings, wall flashings shall be "through" flashings installed so as to provide complete cut-off for moisture and seepage. They shall be of the type and design determined by the architect, and if a patented kind is called for they shall be installed according to the manufacturer's specifications.

All walls having copings shall be (1) covered with copper; (2) through-flashed with copper. Where dowels are used, they shall penetrate the flashing and be rendered water-tight as specified elsewhere.

47. FLASHINGS BETWEEN OLD AND NEW WORK

Where new work is to be flashed against old work, such as at the junction between an old and a new building, the flashing shall be such as to allow for settlement.

(-1) Where the new wall is higher, the top of the old wall shall be covered with a flashing cap, extending completely over it and placed before the new wall is brought up. The old work shall then be flashed and counterflashed to the new, the base flashing being turned down over the old wall and locked to the cap, and the counter-flashing being built in with the new work as specified elsewhere.

(-2) Where the new wall is lower than an old wall, a flashing cap shall be placed over the new wall and turned down on both sides. The joint shall then be flashed and counter-flashed, the base flashing extending down over the new wall and locking to the cap. The counter-flashing shall be set in a reglet cut for it in the old wall and caulked with lead wool.

(-3) When the walls are level, the flashing shall consist of a cap continuous over both walls, properly sloped to shed water, and secured by brass wood-screws to the underside of a two-piece wood blocking secured on top of the walls by others. The flashing shall be in two pieces joined by a standing seam, or a loose-locked seam placed on one vertical side of the blocking so as to prevent leakage and to allow for settlement.

48. WATER-TABLE FLASHINGS

Water-table flashings shall extend up the sheathing at least 4″.

(-1) It shall be formed over the edge of the water-table to make a drip and shall be secured at the upper edge by nails 4″ apart.

(-2) If the edge-strip method of fastening is used the upper edge shall be nailed about every 8″.

49. DRIPS AND EDGE-STRIPS

(1) Where indicated on the drawings, flashings shall be secured by brass edge-strips, ⅛″ thick by 1¼″ wide. Strips shall be fastened to the vertical face of the projection by brass screws about 12″ apart, and set to allow the copper flashing to be hooked over the lower edge at least ⅜″.

(2) Where indicated on the drawings, form drips of hard (cornice temper) copper strips. These shall be nailed to the projection and shall project not more than ⅜″ below the sheathing or the upper fillet of the molding, and shall have the flashing hooked over the lower edge at least ⅜″.

50. EAVES TROUGH AND HANGERS

Eaves trough, or half-round hanging gutters, of the size and type shown, shall be installed where shown on the drawings. They shall be in 10′ lengths and shall be joined by a 1″ lapped and soldered joint, or by slip joints.

All joints shall be made in the direction of the flow.

Eaves trough shall be provided with end pieces, end caps, outlet tubes and mitres as required.

Eaves trough shall be supported by (1) wrought copper strap hangers of approved design; or (2) bronze or copper shank-and-circle-type hangers.

(-1) Wrought strap hangers shall be spaced not more than 36″ apart and shall be secured to the roofing by brass screws.

(-2) Shank-and-circle type hangers shall be adjustable for slope and shall be spaced not more than 36″ apart. They shall be secured by brass screws.

51. BUILT-IN GUTTER LININGS

Where indicated on the drawings, line all box or built-in gutters with copper. Gutter-linings shall fit loosely and shall have the back edge 2″ higher than the front edge. Back edges of linings shall lock to copper roof covering and when used with slate, tile or shingles shall lock to flashing extending up the roof as far as possible without being punctured by the nailing of the roof covering, and secured with cleats.

(1) Small sheets shall be laid with seams staggered. All seams shall be flat-locked and soldered. Sheets shall be secured by cleats, and shall be 14″ x 20″.

(2) Large sheets used to form gutter-linings shall be laid the long way of the gutter. The ends of the sheets shall be flat-locked and soldered but left uncleated to form a continuous "floating" unit.

All gutter-linings over 24″ wide shall have a longitudinal flat-lock seam running the length of the gutter, soldered and secured by cleats.

Linings shall be connected to flashings or to copper roofing by means of large loose-locked seams, folded flat and so placed as to avoid any possibility of leakage. In general the connection shall be made as close to the intersection of the roof slope and the inside of the gutter as is possible.

The back edge of all gutter-linings finishing against vertical walls shall be carried 4″ above the outside edge and shall be covered by cap flashings built into the wall.

(-1) Gutter-linings in wood cornices shall have the front edges turned under the lower edge of a ⅛″ by 1¼″ brass strip screwed to the vertical face of the top member of the cornice. This strip shall be so placed as to form a proper drip.

(-2) Gutter-linings set in stone cornices shall be placed over a wood sheathing or nailing concrete forming the gutter slope. Outer edges shall be locked into a strip secured in a reglet. Where the wash-slope slopes out and the width of outer sheets of the lining exceeds 20″, a standing seam shall be formed at the reglet.

(-3) Gutter-linings in concrete or brick work shall be secured to batten nailing strips or nailing concrete, set by other contractors according to directions by this contractor.

(-4) Gutter-linings formed back of copper cornices shall have the front locked to the top edge of the cornice.

(-5) For expansion joint see Specification 24.

52. BUILT-IN GUTTERS (MASONS' SPECIFICATION)

Cut all reglets for gutter-linings as shown on plans or directed by the architect. Set all battens and nailing strips in masonry necessary for the sheet metal work.

Form all depressions in masonry for outlet boxes as shown on the plans.

Form slopes to outlets in gutters and back of projections which are flashed.

All concrete surfaces to be covered with flashing shall be washed smooth with neat cement. Where cinders have been used in the concrete it shall be painted with two heavy coatings of asphalt paint.

Provide nailing concrete where called for in the drawings, with a smooth and even surface and of required depth.

Consult with the sheet-metal contractor on all details in connection with his work.

53. EXPANSION JOINTS

(-1) ROOFS. Where expansion joints in the roof are shown on the drawings, these shall be formed or flashed with copper. Joints shall be provided in cornices, gutters, roofs, and walls to correspond to all building expansion joints called for to allow for the movement of the building.

(-2) GUTTERS. Where called for on the drawings provide expansion joints at high points, the full height of the gutters. The lining of the gutters shall be turned up and folded back to form flanges over which a cap shall be placed to form a water-tight joint. There shall be sufficient play between the cap and the flanges to allow for the full movement of the gutter and the building. The cap shall have soldered on its outer edge a V-shaped curb to turn water from the roof into the gutter.

54. REGLETS

Where indicated on the drawings or where directed by the architect flashings shall finish in reglets in the masonry cut by others where located by this contractor.

A flashing strip shall be turned into the reglet the full depth and shall be turned back to form a hook.

After the strip is in place in the reglet it shall be secured in place by

plugs at about 12″ spacing, using molten lead on flat surfaces, and lead wool on vertical surfaces.

After caulking, the reglet shall be made smooth by filling with elastic cement.

55. REGLETS (MASONS' SPECIFICATION)

Where indicated on the drawings or where directed by the architect cut reglets in the masonry as located by sheet-metal contractor for the insertion of flashings.

Reglets shall be ½″ wide at the top, ¾″ wide at the bottom, and 1″ deep. They shall be cut with true and straight edges, with sides and bottom roughened.

56. FLASHINGS FOR CORNICES

All masonry cornices, band-courses projecting more than 12″, balconies, balustrades, etc., shall be flashed with copper. Flashings shall be secured on the outer edge by reglets. The back edge shall be continuous at least 3″ above the outer edge and in no case less than 4″ high. Where stone facing on brick backing is used, cap flashings shall be set in and shall cover the base flashings.

Where stone balustrades occur on top of a cornice, etc., flashings shall be set in reglets under the balusters, or shall be continuous through the balustrade and either turn down over the interior roof base flashings as a cap flashing, or be connected thereto by a loose-locked joint. Dowels for fastening balustrade members together shall penetrate the flashing and shall be covered with a copper cap or thimble soldered to the flashing.

Flashings over 24″ wide shall have a full-length longitudinal seam secured by cleats, and shall have a standing seam at the reglet.

57. OUTLETS FOR BUILT-IN GUTTERS

Outlets shall be formed as shown on the drawings. The gutter lining shall be turned into them and secured by soldered lap seams.

Holes shall be cut as soon as the lining is placed and temporary spouts shall be put in until the permanent drainage is ready.

Outlets shall be connected to leaders by

(-A) a 20-oz. copper tube;

(-B) a seamless copper tube.

Connections shall be flanged at the top and soldered to the outlet-box lining; the bottom shall have soldered to it a brass ferrule or caulking ring furnished by the plumbing contractor.

58. ROOF-DRAINS

(-1) Approved types of patented roof drains may be used. They shall be furnished and set by the plumbing contractor and connection shall be made to them by the sheet-metal contractor in strict accordance with the manufacturer's directions.

(-2) Roof drains shall consist of a circular or square pan whose diameter or side shall measure at least 4″ greater than the outlet, and have a depression of not less than 1½″. They shall have a flashing extending out on roof surfaces, on all sides of the pan, not less than 6″. The flashing or pan shall be provided with a rib forming a gravel-stop or of proper height to receive (1) built-up (2) promenade-tile roofing.

(-3) Roof drains shall consist of a copper flange extending out on the roof on all sides a distance at least equal to the size of the outlet. The flange shall be provided with a rib or gravel-stop against which to finish (1) built-up (2) promenade-tile roofing.

59. OUTLETS FROM DRAINS

Outlets from Drains shall consist of:

(-1) a 20-oz. copper tube, soldered to the (A) pan; (B) flange, and (1) extending into the drain pipe at least 6″ with the outside coated with asphaltum; (2) with a brass ferrule or caulking ring soldered to the end of connection to the drain pipe by the plumbing contractor.

(-2) a seamless copper tube, flanged at the top and soldered to the (A) pan; (B) flange. Connections to the drain pipe shall be made by the plumbing contractor.

60. ROOF DRAINS AND GUTTER OUTLETS (PLUMBERS' SPECIFICATION)

(-1) *Furnish the sheet-metal contractor all brass ferrules necessary for connecting the drainage system and the roof drains and outlets shown on the plans, and connect copper tubes fitted with these ferrules to the drain pipes by caulked and leaded joints.*

(-2) *Furnish and install complete with all piping connections the patent drains shown on the plans. Make provision, where necessary, for the work of other trades in connecting to the drains.*

(-3) *Where shown on the plans furnish and install a seamless copper tube of a length necessary for the sheet-metal contractor to make a proper connection to the outlet-box or roof drain, and with a brass ferrule or caulking ring for connecting to the drain pipe.*

61. STRAINERS

(-A) All outlets from gutters and roofs shall be provided with heavy, cast brass, removable strainers the full size of the outlet-box.

(-B) All gutter outlets shall be fitted with approved copper wire strainers of the basket type set in loosely.

62. SCUPPERS

Flash all scuppers with copper, making same a part of the roof flashing. Scupper flashings shall cover the interior completely and shall extend through and project outside of the wall. Seams shall be locked, or lapped, and soldered. Scupper flashings shall be joined to roof flashings by soldered seams.

63. SCUPPERS (CARPENTERS' OR MASONS' SPECIFICATION)

All enclosed roof surfaces, including balconies, etc., shall be provided with scuppers or auxiliary drains. The bottom of scuppers shall be not more than 2″ above the finished roof surface at the lowest point.

64. AUXILIARY DRAINS

Auxiliary drains shall be so constructed that their outlets are separate from the main outlets and shall be at least 3″ above the main outlets. They may be connected to the main drain by means of a Y branch.

65. CURBS

Curbs around roof openings shall have a flashing turned down on the inside about 3″ and secured with nails 1½″ apart. It shall extend out on the roof as specified for base flashings.

66. CRICKET OR SADDLE FLASHINGS

Crickets or saddles formed back of all vertical surfaces, such as chimneys, etc., breaking through sloping roofs, shall be covered with copper. The flashing of these crickets shall be made a part of the flashing along the sides of the chimney, etc.

67. VENT FLASHINGS

All pipes passing through roofs shall be flashed and counter-flashed. Base flashings shall extend out on the roof not less than 6″.

(-1) They shall be of sufficient length to cover the roofing course next below the pipe and to extend up under the roofing course above as far as possible without puncture by nails.

(-2) Where vent-pipes extend more than 12″ above the roof the counter-flashing shall be caulked into the hubs or held with brass clamps embedded in elastic cement or white lead. It shall lap the base flashing at least 4″.

(-3) Where the vent extends not more than 12″ above the roof surface, it shall be flashed as follows:

CAST IRON PIPE. The base flashing shall be carried up to within 1″ of the top of the pipe and shall be counter-flashed by a copper cap 6″ high, turned over and down into the pipe at least 2″.

THREADED PIPE. The base flashing shall extend up to within 2″ of the end of the pipe, which shall be threaded. After the flashing is in place the threads shall be covered with white lead and an iron or steel cap, of such design as to enclose the flashing material, shall be screwed onto the pipe.

(-4) Patented vent-flashing devices may be used, subject to the approval of the architect. They shall be made of 18-oz. copper, shall be the product of a recognized manufacturer, and shall be installed according to manufacturer's directions.

68. VENTILATOR FLASHINGS

Where metal ventilators are used on a roof they shall be connected to the flashing by a soldered lap seam. The flashing sheet shall extend out over the roofing on all sides at least 6″.

(-1) On shingle or slate roofs the flashing shall be secured by round-head brass wood-screws set through holes drilled in the roof covering. The screws shall be set with slotted brass washers and shall be soldered to the flashing. The screws and screw holes shall be covered with soldered copper caps.

69. FLASHING AROUND STEEL STRUTS

Where steel struts, etc., penetrate a flat roof, a copper pan about 2″ high above the finished roof level shall be formed around the member. It shall have a flange projecting out on top of the roofing at least 2″. This flange shall be soldered to the copper roofing, or with built-up roofing shall be covered with two layers of felt carried out on the roofing not less than 6″ and well-mopped with pitch. The pan so formed shall be filled with pitch, and the top surface sloped to drain freely.

On sloping roofs the procedure shall be the same except that the sides of the pan shall be so proportioned as to retain the pitch.

70. FLAG POLE FLASHINGS

(-A) Flag poles penetrating a flat roof shall have a circular base flashing extending up the pole at least 10″ and 1″ larger in diameter than the pole. It shall be turned out at the top to cut off drifting snow. A conical hood secured to the pole by a 1″ brass band set in white lead

and bolted, shall lap the base flashing at least 3". The whole flashing shall be so consructed as to allow for the movement of the pole.

(-B) Patented flashing-flanges or similar devices for flashing flag poles shall be used subject to the approval of the architect. They shall be the product of a recognized manufacturer and shall have a flashing of 18-oz. copper. They shall be installed in accordance with the manufacturer's directions.

71. WINDOW AND DOOR HEAD FLASHINGS

Window and door frames set in frame construction shall have a flashing of copper over the head. This flashing shall be set after the frame is placed and shall be carried up the wall 2" above the butt of the second course of shingles, slate, etc., and in no case less than 3" above the window head. The bottom edge of the flashing shall be

(-A) secured to the trim by an edge-strip as specified elsewhere.

(-B) turned down over the trim and shall finish back of, and be secured by, the outside molding of the trim.

(-C) nailed at 1" intervals to the vertical face of the trim.

(-D) bent at a sharp angle to bear tightly against the top fillet of the molding, and the upper edge of the flashing, under the shingles, shall be secured by nails placed about 8" apart.

72. WINDOW AND DOOR SILL FLASHINGS

(-1) Sill flashings for window frames in frame construction shall be set before the frame is placed. They shall extend to the back of the window sill and shall be nailed after the frame is set, and shall also extend out to the face wall.

(-2) Wood sills set in stone or concrete shall have a strip of 20-oz. or heavier hard (cornice temper) copper or a bronze bar at the joint. Just before setting the wood sill the reglet shall be filled with waterproofing-compound and the strip shall be embedded in it.

73. WINDOW AND DOOR SILL FLASHINGS (CARPENTERS' AND MASONS' SPECIFICATIONS)

The sills of wood frames set in stone or concrete shall have a slot 1" deep to receive a copper or bronze flashing strip. Stone or concrete sills under wood window or door frames shall have a 1" x 1" reglet cut or cast in them to receive a copper or bronze flashing strip.

74. GRAVEL-STOPS

Gravel-stops shall be placed at the edges of all built-up roofs covered with slag or gravel. They shall be formed of one piece of copper to provide a ridge the full height of the roofing material at the outer edge. They shall project on the roof at least 4", and be nailed on top of the waterproofing fabric, embedded in pitch, and covered with two layers of felt well-mopped with pitch.

75. COLUMN-CAP FLASHINGS

The upper surfaces of all exposed column caps shall be flashed. The flashing shall be formed to fit the cap and shall be turned down ½" over the edge of the cap and fastened. A separate piece shall be fitted over the dowel and soldered to the main flashing.

76. COLUMN-BASE FLASHINGS

Bases of wood columns on a roof shall be flashed by a cap made to fit the dowel used to secure the column. The cap shall have a flange extending out on the roof on all sides the necessary distance to provide for water-proofing, as specified elsewhere for different kinds of roofing materials.

77. SCUTTLES

Covers of roof scuttles shall be covered with copper. Sheets shall be laid with flat seams soldered, and shall be carried over the edge to the underside where they shall be secured with nails 1½" apart.

78. SKYLIGHTS

Where shown on the drawings, build skylights of size indicated and of approved design and manufacture, with curbs at least 10" above the roof. All sheet metal shall be 16-oz. hard (cornice temper) copper, reinforced where necessary for strength and stiffness with steel sections. Copper and steel shall be insulated by coating the steel with asphalt paint, or by using lead-coated copper. All sash bars and bearings for glass shall have condensation gutters leading to the outside of the skylight. All skylights shall be made water- and weather-tight with joints interlocked, riveted and soldered and shall conform to the requirements of the National Board of Fire Underwriters. Duplicate sets of detail drawings shall be submitted for approval.

79. LOUVRES

Where shown on the drawings, louvres shall be formed of

(-A) copper,

(-B) wood covered with copper.

Duplicate sets of detail drawings shall be submitted for approval.

80. COPPER CORNICES

Where shown on the drawings, cornices shall be erected of 20-oz. hard (cornice temper) copper. They shall be made in strict accordance with the profiles shown on drawings with mouldings true, sharp and straight. All flat surfaces over 5" wide shall be crimped, all mitres and joints carefully fitted, angles and corners reinforced, and all joints neatly riveted and soldered together and made watertight. Cornice work shall be reinforced with properly-shaped steel brackets, separated from the copper by 3-lb. sheet lead.

The top edge shall be formed over a heavy brass or bronze edge-strip or drip properly shaped to permit the joining of the top flashing or gutter-lining as specified elsewhere.

Ornaments shall be stamped in soft (roofing temper) copper with dies made from approved models.

Duplicate sets of detail drawings shall be submitted for approval.

81. COPPER-COVERED WALLS

On vertical walls marked "Copper," such as bulkheads, skylight curbs, penthouse walls, etc., erect standing seam or paneled surfaces as indicated. All standing seam work shall be fastened to wall surfaces with cleats nailed with copper nails to wood sheathing, or furring strips. All paneled work shall have casings or strips to receive copper. Crimped sheets shall be used for all large panels and large areas of plain surfaces.

82. SAW-TOOTH ROOFS

Flashings for gutters in saw-tooth roof construction shall be carried up the sloping roof at least one foot beyond the "line of minimum-shadow" as indicated on the drawings, and shall be secured under the roof covering by cleats. Flashings shall be laid with flat seams, except on the vertical side where the flashings may be made with standing seams. Gutter-linings shall be made continuous and shall serve as base flashings for the window sill and side flashings.

Gutter-linings over 18" wide shall have a full length longitudinal flat-lock seam in the center of the gutter.

(Under carpenters' specification provide for snow racks of boards to prevent injury when gutters are cleared of snow.)

83. LEADERS, CONDUCTORS, OR DOWNSPOUTS

Leaders shall be installed where shown on the drawings, of the shapes and sizes indicated. They shall be held in position, clear of the wall, by

(-1) Brass hooks, driven into the wall not more than 6' apart.

(-2) Heavy brass or copper straps, ⅛" by 1½", spaced not more than 6' apart, soldered to the leaders, and fastened (1) to wood work by brass screws; (2) to masonry by brass screws set in lead sleeves.

(-3) Ornamental straps of (1) stock design; (2) the design shown, and made of (1) hard (cornice temper); (2) soft (roofing temper) copper.

Leaders shall be in 10' lengths and shall have joints lapped. A 1½" slip joint shall be provided every 20' of leader.

When leaders connect with underground drains they shall be fitted into drain-pipes and shall have the joint neatly cemented. All leaders not so connected shall have elbows at the bottom. Those discharging at ground level shall have heavy shoes with reinforced ends.

84. LEADER HEADS

Leader heads of (1) stock design; (2) the design shown, shall be placed where indicated on the drawings. Outlet tubes from gutters shall extend into them about 2". The leader head outlet shall extend at least 2" into the leader.

Large leader heads (12" wide or over) shall have a heavy copper-wire removable screening over the top.

85. SNOW-GUARDS (ROOFERS' SPECIFICATION)

(-1) *Furnish and erect on sloping roofs approved copper wire snow-guards spaced not more than 13" apart in both directions and staggered.*

(-2) *Furnish and set at eaves a snow-stop consisting of three ½" bronze bars set in approved manner with bronze supports.*

86. CLEANING COPPER

All copper work when finished shall be thoroughly cleaned of all flux, scraps and dirt. On large areas this shall be done as each section of the work is finished. Excess flux which may cause acid stains shall be neutralized by washing with a 5% to 10% solution of washing soda (or a solution of about one pound of lye in a pail of water.) After cleaning the copper shall be washed off with clear water.

87. PAINTING COPPER

Copper shall first be thoroughly cleaned, free from dirt and grease, and absolutely dry. If possible the copper shall be permitted to weather through several rainstorms until the surface takes on a slight tarnish from its oxidation by the atmosphere. Lead base paints shall be used for painting all copper work.

CHENEY
REG. U. S. PAT. OFF

CHENEY FLASHING

WILL PROTECT YOUR CLIENTS' PROPERTY AGAINST . . . . . .

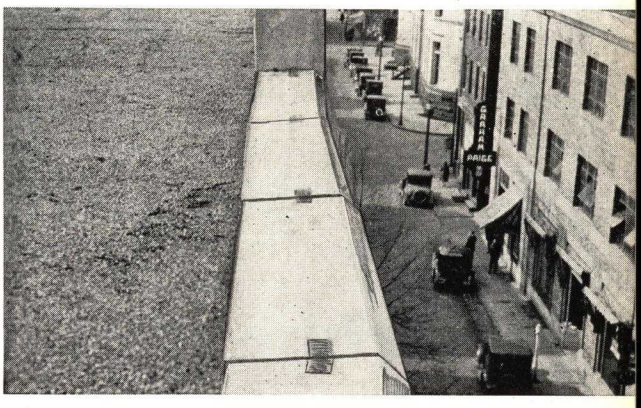
SEEPAGE AND LEAKS

Wherever any part of a masonry wall is directly exposed to rain and snow, water seeps into the wall; sometimes directly through the stone or brickwork, but invariably through the mortar joints. Penetrating downward it causes serious damage to both interiors and exteriors of buildings, even to the astral disintegration of the walls. Alternate freezing and thawing of wet walls in cold weather disrupts the masonry, entails expensive repairs and may even cause the parapet to fall into the street.

HAZARDS OF IMPROPER BOND

The hazard of falling copings and parapets, caused by insufficient bonding in the conventional types of thru-wall flashing, and the legal entanglements that ensue when walls fall from this cause, are too great to "take a chance"—and there have been many such failures in this country during the past few years. Cheney Flashing which bonds longitudinally, transversely and vertically eliminates this hazard.

It is highly improbable that the designers of the Empire State Building, New York, would have installed Cheney Flashing under the coping stones of the parapet at the 86th story, and without dowels, had they not been certain that Cheney Flashing formed a positive unbreakable key-bond—vertically as well as laterally with the masonry, and would retain this bond for the life of the building.



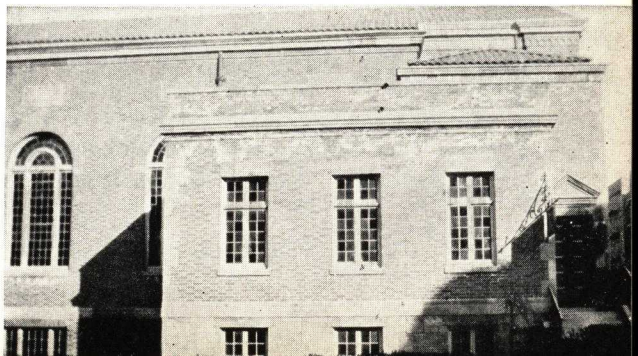
DEFACEMENT OF INTERIOR PLASTER

Damp interior walls and ceilings with paint and plaster constantly falling, are a menace to health, and an eyesore to owner and occupants, who insist upon the damage being repaired frequently.

Temporary repairs to masonry, plaster and paint are costly and fail to remedy the cause. It is the architect's responsibility to see that thru-wall flashing is properly selected and installed when the building is being erected.

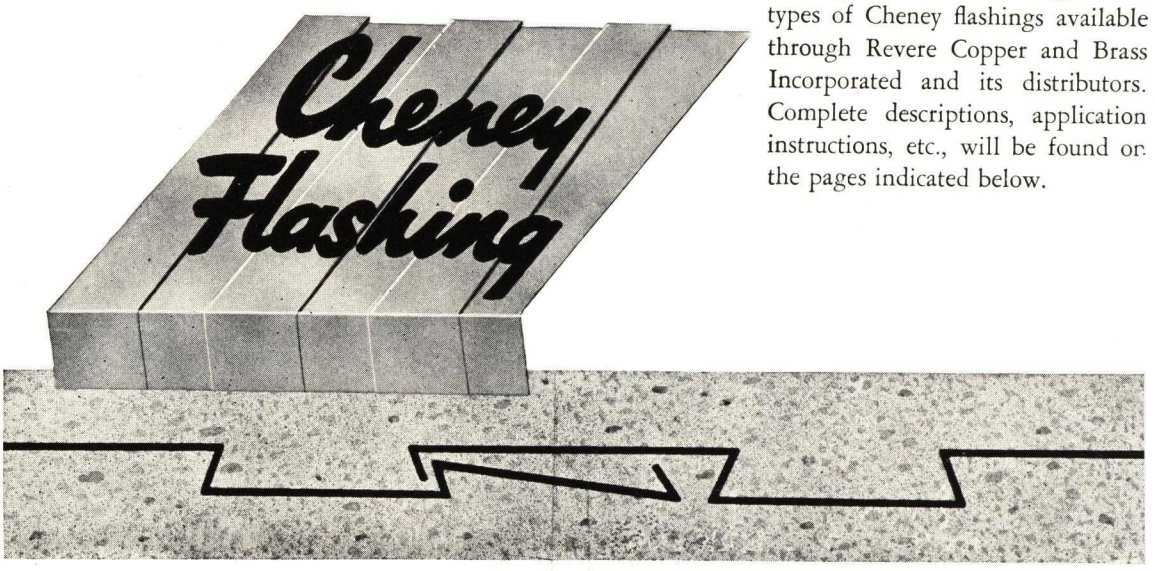
EFFLORESCENCE

Efflorescence appears upon the exterior or masonry wall as a whitish deposit. It is caused by water seeping down through the wall and carrying with it the mineral salts in the mortar and brick to the wall surface, where the water evaporates leaving the unsightly whitish deposit. Efficient thru-wall flashing is the best way to safeguard against this condition.



CHENEY FLASHING TYPES

Cheney pioneered and introduced mechanically keyed Thru-Wall Copper Flashing to the architects and engineers of America. Millions of feet have been installed in most of the nation's fine buildings as well as in hospitals, colleges, libraries, apartment and office buildings and industrial plants. The following are the types of Cheney flashings available through Revere Copper and Brass Incorporated and its distributors. Complete descriptions, application instructions, etc., will be found on the pages indicated below.



CHENEY FLASHING (16 oz.)

Cheney Flashing (16 oz.) is scientifically designed to provide perfect drainage with the positive key-bond in all directions—vertically, transversely and longitudinally. It positively prevents leaks and seepage and may safely be specified by the architect for the most exacting requirements. It is especially recommended for exposed work.

For description and application see page 35.

THREE-WAY FLASHING (10 oz.)

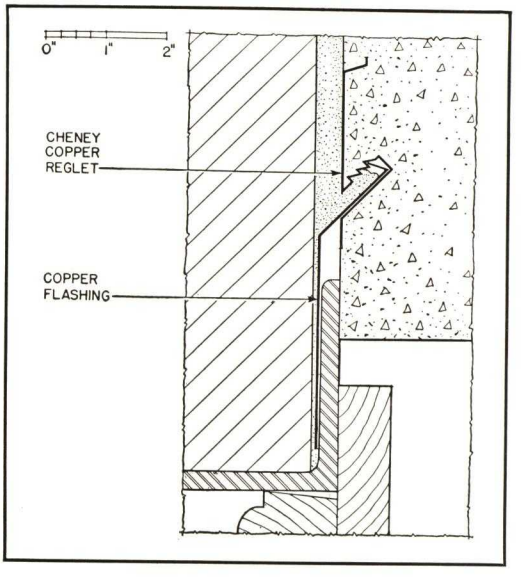
Three-Way Flashing (10 oz.) is identical in form to Cheney Flashing (16 oz.), the only difference being in the weight of copper used. It is especially recommended for concealed work where it can be recommended in preference to fabrics, plastics, wire mesh membranes, paper thin copper sheets covered with asphalt bitumens or building papers.

For description and application see page 38.

CHENEY SPANDREL WATERPROOFING

The Cheney System of Waterproofing is based on an entirely new principle. It involves two members; a reglet of 16 oz. copper, the upper surface of which is of saw-tooth design and a counterflashing of plain Revere Copper which is locked firmly into place. It offers very definite advantages over the usual membrane methods which disintegrate.

For description and application see page 39.



ALWAYS AVAILABLE

Stocks of Cheney Flashing are available through Revere sheet metal distributors throughout the United States. This important service eliminates costly delays.

CHENEY FLASHING (16 oz.)

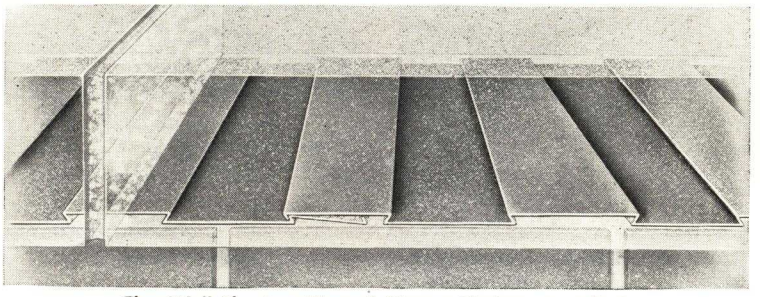
Cheney Flashing has been designed to overcome the weakness of ordinary thru-wall flashings. The Keybond construction of Cheney Flashing provides a "Factor of Safety" which includes two exclusive features that cannot be equalled by ordinary flashings; it bonds the masonry laterally and vertically in every direction, and in addition, its exclusive design provides numerous weep-holes that drain the walls quickly. The design of the flashing also takes care of expansion and contraction.

The keybond and drainage features are of the utmost importance in proper building construction.

The key bonding is especially important in the construction of high buildings where severe storms, high winds and the natural swaying of the buildings tend to loosen coping stones and parapets and hurl them below with a consequent loss of life or serious damage to people and property.

Flashings that bond only laterally, therefore, should not be specified or used for copings, parapets, cornices or other exposed areas with any confidence that they will provide safe or permanent protection.

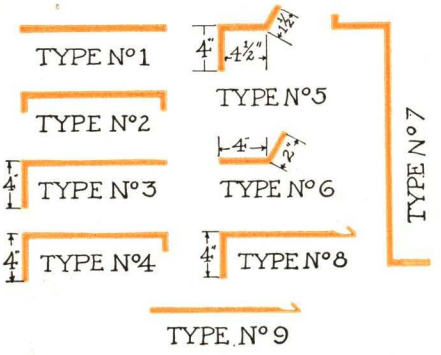
The self-draining feature is also particularly valuable, especially in cold weather when it is absolutely essential that water should drain from the walls quickly—before freezing. If permitted, alternate freezing and thawing soon breaks up the mortar joints, sometimes even the stonework itself, thus greatly weakening the wall.

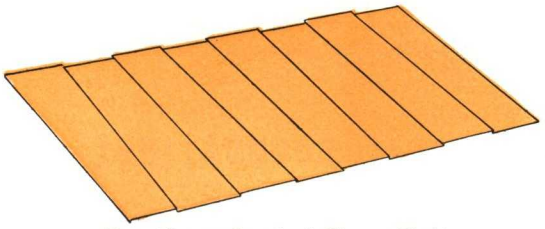


Thru-Wall Phantom View of Cheney Flashings Installed

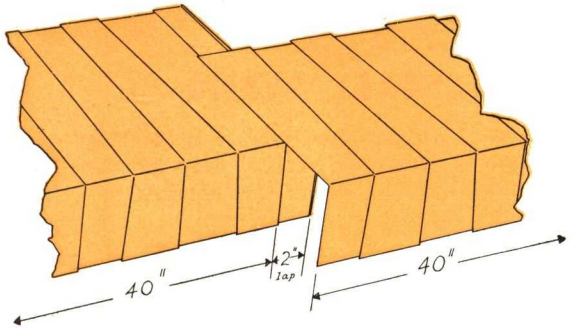
SIZES Cheney Thru-wall Flashing comes in sheet form in widths from 6 to 60 in. (in even widths), and in the special forms illustrated at the right.

The standard overall length of the above sheets is 42 in. When laid up, they measure 40 in. In estimating the footage required, add 5% to net linear footage to allow for laps. Cheney Flashing is available in plain Copper or Lead Coated Copper.





Type No. 1—Standard Cheney Flashing



Two No. 3 Cheney Flashing Showing Lapping Feature—No Soldering Needed

FEATURES Fundamentally—CHENEY Flashing functions in a very definite manner:

1st. It forms a positive mechanical Keybond in every direction within the mortar bed—vertically as well as laterally.

2nd. It provides perfect drainage so that if moisture should penetrate a wall, it will drain quickly.

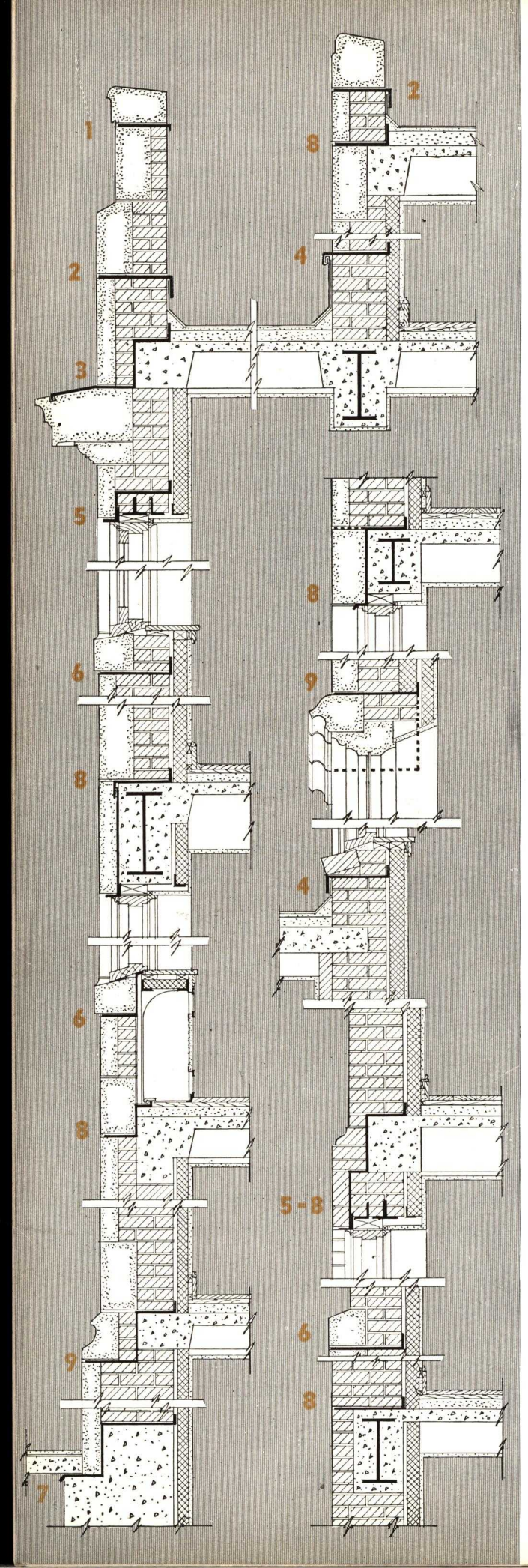
3rd. It provides adequately for expansion and contraction.

4th. It has a water-tight, interlocking lap that requires no soldering.

5th. It has a stiff counterflashing face that hugs the wall tightly after the base flashing has been installed.

All of these features were given careful study and intensive testing, and their positive functionings were THOROUGHLY PROVED before a single foot of Cheney Flashing was marketed.

FOR SPECIFICATION SEE PAGE 41 SPECIFICATIONS A B C AND D.



WHERE CHENEY FLASHING IS NEEDED

1. UNDER COPING STONES

Cheney Thru-wall flashing should be used under coping stones, as all stones are porous and the stones themselves expand and contract opening up cracks at the joints. Thru-wall flashing under the coping stones, therefore, not only bonds the stones to the wall without the use of dowels, but also prevents the moisture from getting through into the wall itself.

2. JUST ABOVE ROOF LINE

Thru-wall flashing should be used as a counter flashing just above the roof line to continue the roof to the outside faces of the building on all sides.

3. OVER TOPS OF CORNICES

Thru-wall flashing should be used over the tops of wide stone cornices; that is, cornices extending out from the wall 18 inches or more. On narrower cornices it should be used under the cornice. Flashing is necessary at this point because of the porosity of the stone and the fact that the stones expand and contract, opening up the vertical joints and allowing moisture to enter.

4. THROUGH PENTHOUSE AND RISING WALLS

Thru-wall flashing should always be used entirely through penthouse walls and all rising walls above roofs at a point just above the roof line.

5. OVER DOORS AND WINDOWS

Thru-wall flashing should be used over the heads of all windows and door openings to prevent the moisture that enters the wall from above from working down by gravity to the inside of the building.

6. UNDER WINDOW SILLS

Thru-wall flashing should be used under stone or brick window sills which are porous and which become saturated after continued rains.

7. OVER CONCRETE FOUNDATIONS

Thru-wall flashing should be used over concrete foundations where the first courses of stone or brick start upward, to prevent moisture from coming up into the walls from below by capillary attraction.

8. AT ALL SPANDREL BEAMS

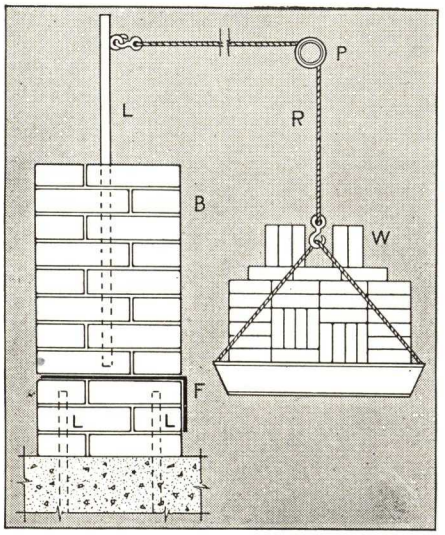
Thru-wall flashing should be used at all spandrel beams to keep moisture away from the steel, to keep moisture from running in at the floor line, and to keep moisture away from the window heads below.

9. AT PROJECTING BELT COURSES

Thru-wall flashing should be used at all projecting belt courses where moisture tends to enter at the horizontal mortar joints as well as through the vertical joints of the stone itself.

TESTS OF CHENEY FLASHING

MASONRY BOND TEST



Resistance to Rupture is the real test for any wall flashing. Tests made by Prof. Frederick O. Anderegg prove conclusively that Cheney Flashing does make a positive mechanical bond.

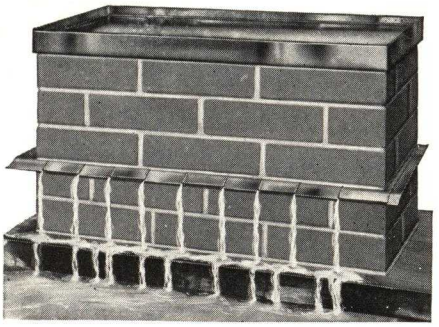
Explanation of Test Diagram—B—12 x 36 x 42 in. panel. F—Cheney Flashing. L—Steel angle irons. P—Pulley. R—Rope. W—Weights.

Two tests were conducted, one with Cheney Flashing, one with plain copper. After panel had been exposed to weather for 28 days, weights were added until wall fractured. Test with Cheney Flashing showed wall had a Modulus of Rupture of 27 lbs. per sq. in. compared to 9 lbs. per sq. in. for copper having no vertical bond. Before wall could be pulled over, mortar in Cheney keys had to be sheared off, proving an effective mechanical anchorage.

The force required to pull the panel over was equivalent to a wind velocity of 264 miles per hour, the full pressure of which was directly against the wall. Calculated in the same way, the *Cheney Flashing would withstand a wind velocity of 1490 miles per hour* under a six inch coping stone.

These figures are conservative. Bear in mind this panel was only 42 inches long and lacking the stiffening of adjacent sections of the wall and of cross walls at the ends.

DRAINAGE TEST

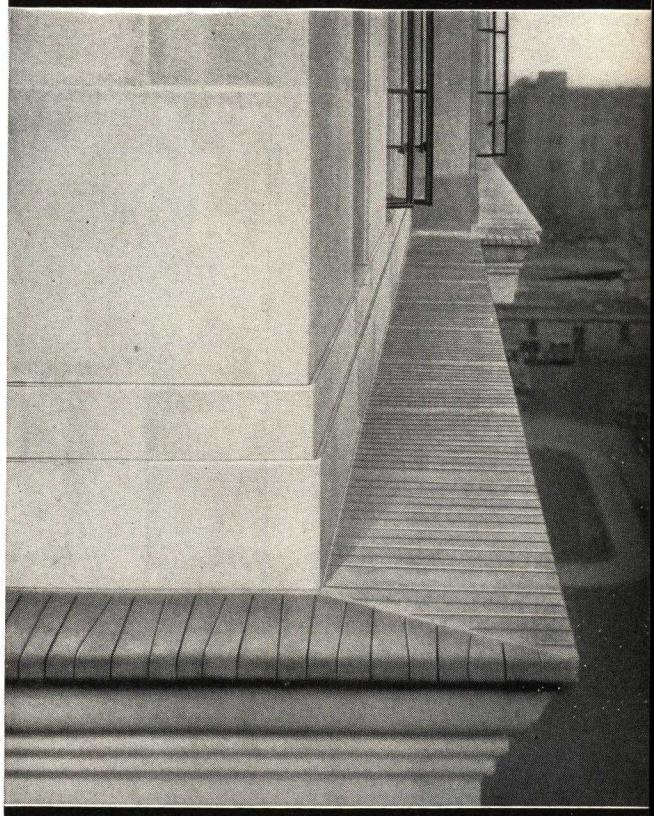


The self-draining feature of Cheney Flashing is also particularly valuable, especially in cold weather when it is absolutely essential that water should drain from the walls quickly—before freezing. If permitted, alternate freezing and thawing soon break up the mortar joints, sometimes even the stonework itself, thus greatly weakening the wall.

Photo shows brick test panel of standard construction with Cheney Flashing installed and bottomless pan on top.

Water equivalent to cloud burst precipitation, about 24 inches per hour, was poured into pan. In 37 seconds the water flowed out of wall over flashing, from each lower key, the length of panel, proving that Cheney Flashing automatically provides its own weepholes.

Cheney Flashing Is Laid Quickly and Easily as the Masonry Progresses. The Ends of the Flashing Interlock to Form a Watertight Joint without Solder.



Cheney Flashing Installed on Cornice, Massachusetts Institute Technology. After Five Years' Exposure the Flashing Remains in Perfect Condition.

Laying Coping Stone, 86th Story, Empire State Building, N. Y. Note Absence of Dowels. Cheney Flashing Permits Such Installations on Parapets and Copings. It's the Safe

THREE-WAY FLASHING (10 oz.)

Three-Way Flashing (10 oz.) is identical in form to Cheney Flashing (16 ounce), the only difference being in the weight of Copper used.

RECOMMENDED USES Three-Way Flashing is recommended for the continuous flashing of spandrel beams for the flashing of window heads, window sills, belt courses and for all unexposed thru-wall flashing generally. However, for thru-wall flashing in parapets, for counter flashing, cornice and all exposed work we strongly recommend the use of Cheney Flashing (16 ounce).

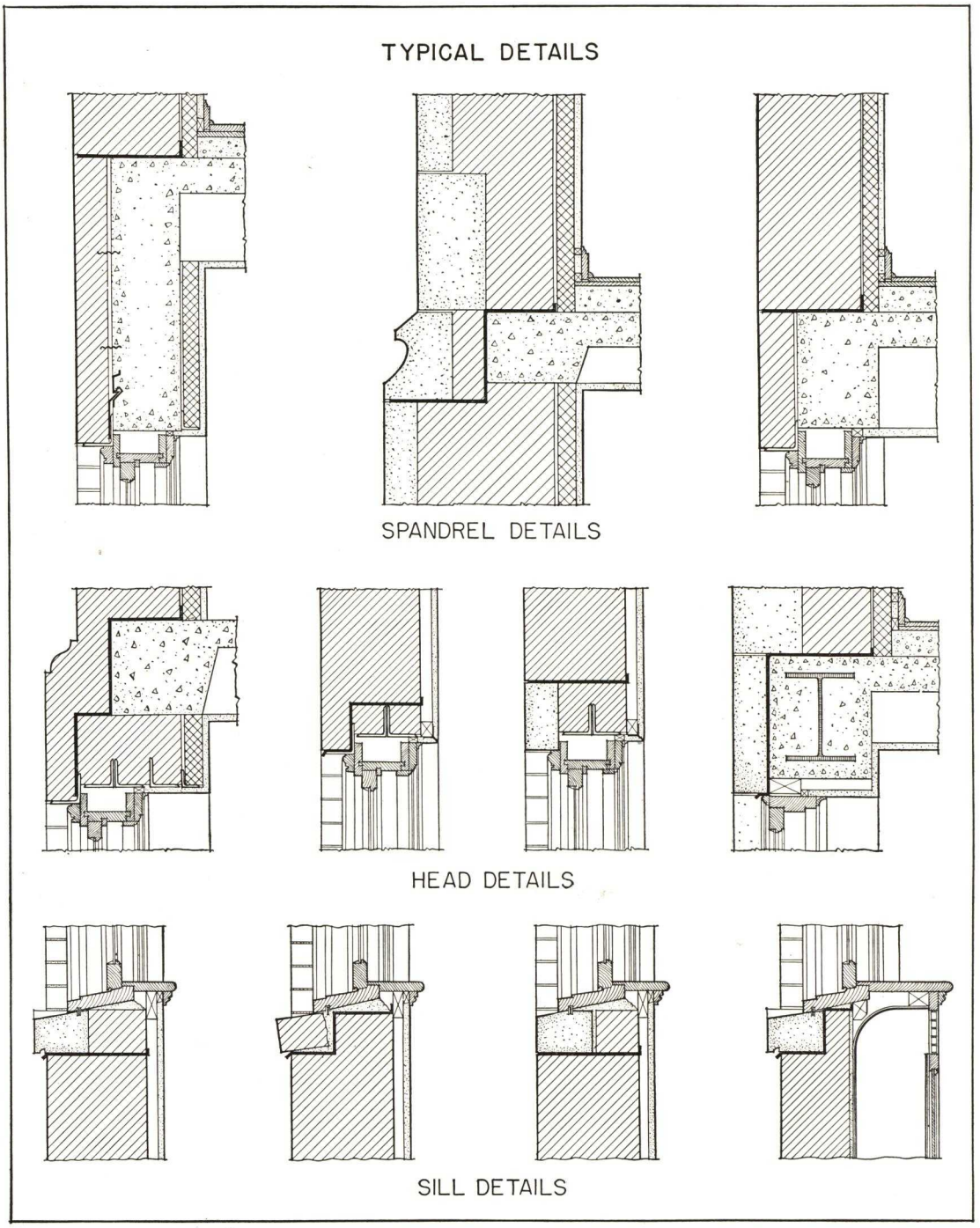
Three-Way (10 ounce) Flashing when used to flash spandrel beams as detailed in section drawings below, is less expensive than the use of fabrics, plastics, wire mesh membranes, paper-thin copper sheets covered with asphalt bitumens or building papers.

In fact its cost is so low that it may be used freely to provide maximum protection against leaks, seepage and the like throughout any masonry building. Of utmost importance is the fact that many of the above materials, due to their very nature, act as gaskets when set between two layers of masonry and thus retard the drainage of the seepage moisture. Three-Way (10 ounce) Flashing on the other hand, provides drainage with unique efficiency. This is done by the means of "Z" bends, the same feature that is largely responsible for its bonding superiority and for its automatic compensation for expansion and contraction. Shrinkage of mortar forms a "weephole" in every "Z" bend. No water is trapped to freeze and crumble mortar and masonry. Interlocking lap joints at the ends of each sheet form a continuous watertight flashing without soldering.

Three-Way (10 ounce) Flashing is more permanent because copper is not affected by mortar or any other masonry material.

STANDARD SIZES Three-Way Flashing as supplied in sheets form in widths from 6 to 36 inches. The standard length is 42 inches, of which 2 inches should be allowed for overlap. Available in plain Revere Copper or Revere Leadtex (lead coated copper) through Revere distributors.

DETAILS OF THREE-WAY FLASHING



FOR SPECIFICATIONS SEE PAGE 41 SPECIFICATIONS C AND D

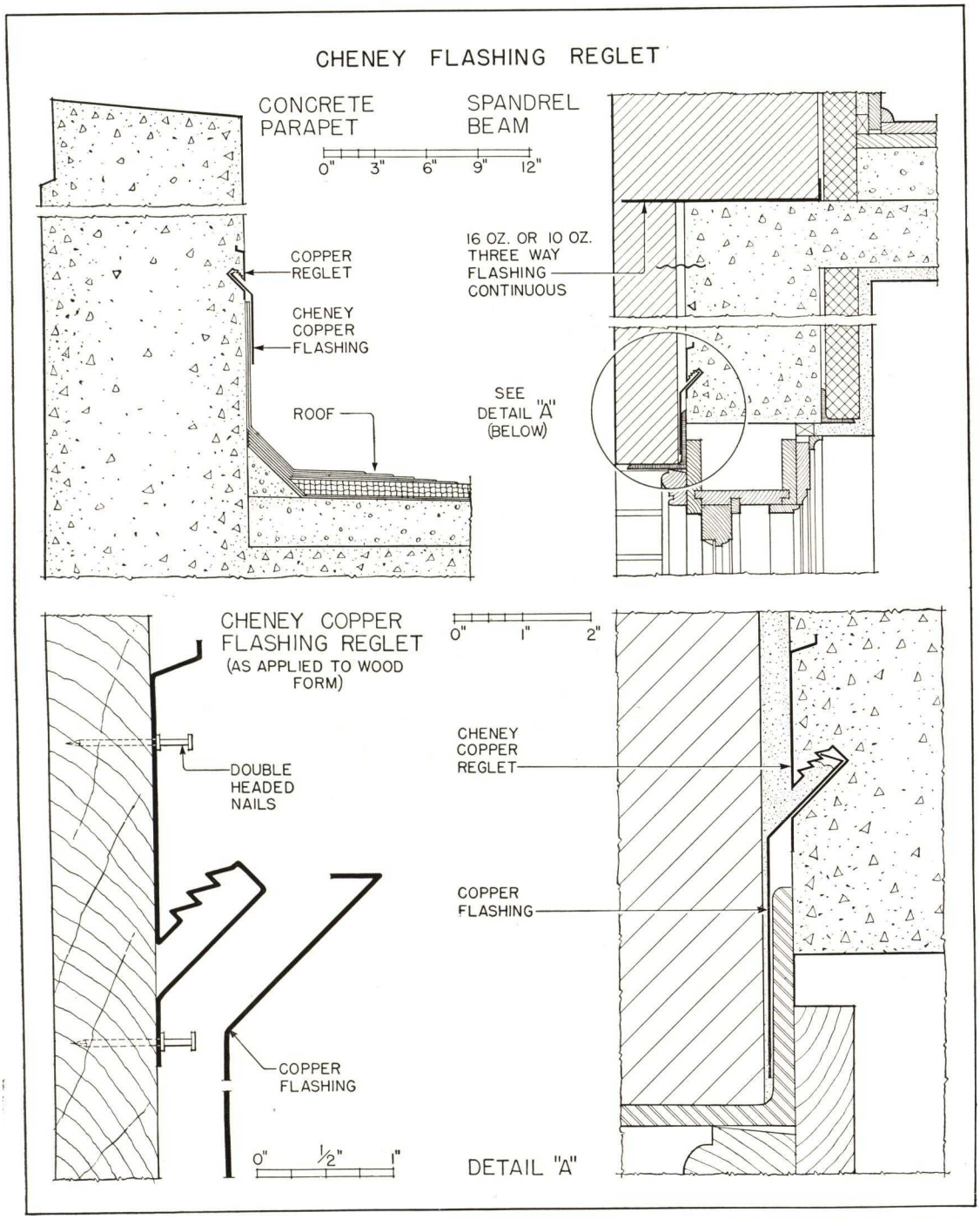
CHENEY SPANDREL WATERPROOFING

THE CHENEY SYSTEM Architects generally agree that Spandrel Waterproofing is necessary to modern construction. Many methods have been tried without complete success, among them being asphalt fabrics, felt membranes, wire mesh membranes, and paper-thin copper sheets covered with asphalt bitumen or building papers. Failure has been due to the disintegration of the materials themselves, the ease with which they puncture, and their inability to provide quick drainage of the moisture from the wall.

The Cheney system of Spandrel Waterproofing is based on an entirely new and different principle. As noted in the details below, Cheney Flashing (16 oz.) or Three-Way Flashing (10 oz.) is carried completely through the wall continuously around the entire building at the top of the spandrel beam as near as possible to the line of the finished floor. Cheney Flashing Reglet of 16 oz. copper is nailed to the forms so that a 45 degree slot is formed at the bottom of the concrete beam just above the top of the lintel angle extending six inches beyond each end of the opening below. During construction, after the lintel angle is in place, a piece of plain copper flashing bent to detail is inserted full depth into Cheney Flashing Reglet, the upper surface of which is of saw-tooth design, thereby locking the flashing firmly into place.

ADVANTAGES

(1) Simplicity of installation.
(2) Copper is permanent and able to withstand abuse.
(3) Provides weep hole drainage—a feature of Cheney Flashing.
(4) And most important: usualy costs one half of the usual membrane methods.

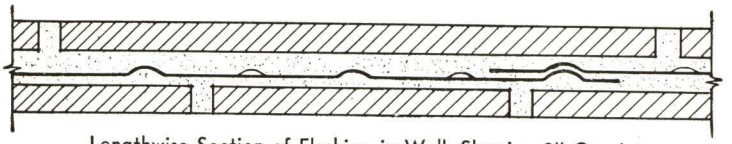


DETAILS OF CHENEY SYSTEM OF SPANDREL WATER-PROOFING

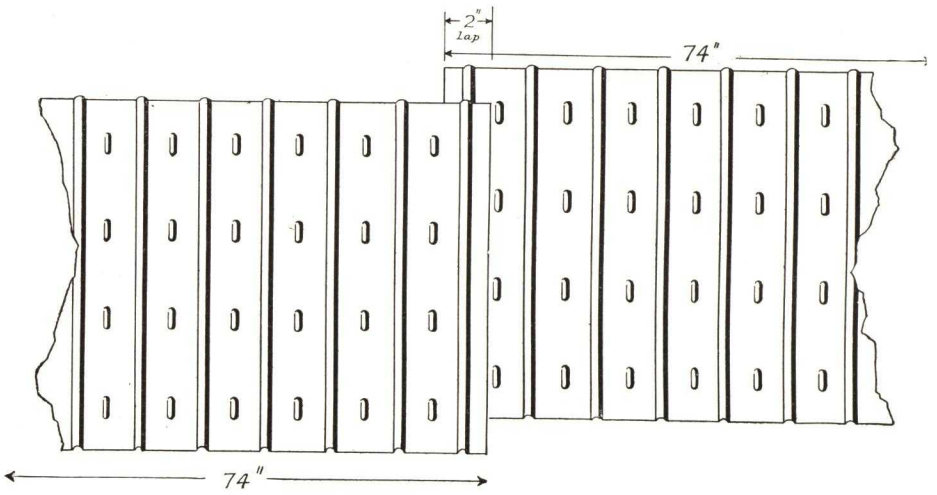
FOR SPECIFICATIONS SEE PAGE 42 SPECIFICATIONS F AND G

REVERE THRU-WALL FLASHING

Revere Copper Thru-Wall Flashing is a patented, low priced flashing which will positively prevent leaks, seepage and efflorescence in masonry walls. The pattern or design of this flashing prevents lateral movement of the wall. This pattern is rolled into the sheet, not stamped, which prevents thinning or hardening of the ridges and bumps and holds the original softness of the copper over the entire sheet.



Lengthwise Section of Flashing in Wall, Showing 2" Overlap



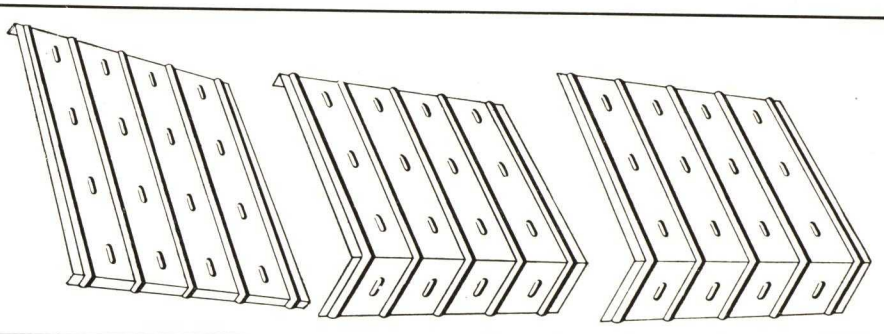
DESCRIPTION Revere Thru-Wall Flashing is designed so that water will weep out of the wall and lateral movement of the wall in all directions is prevented, due to the unusual mechanical bond between mortar and flashing. A water-tight interlocking joint is made between the flashing sheets without the use of solder to form a continuous flashing and to take care of expansion and contraction. This over-lap is 2 in., which meets Government specifications.

In the design of the flashing there are raised ribs $\frac{3}{16}$ in. high, spaced 3 in. apart. These are rolled into the sheet rather than stamped. The ribs run all the way across the flashing. This provides a distinct advantage because when the flashing sheet is bent to form a 4-in. counterflashing face, it is much stiffer than plain copper which tends to be wavy when it has been bent up and down. There is also a series of embossings, $\frac{3}{16}$ in. high and approximately $\frac{1}{2}$ in. wide and 1 in. long, which prevents "in and out" movement.

SIZES Revere Thru-Wall Flashing is furnished in sheet form in even inch widths from 8 to 36 in. and overall length of 74 in., which when laid up with the lap measure 72 in.; these sizes will meet practically any need. It is available in 16 oz. Soft Copper or Revere Leadtex, lead coated copper. Revere Thru-Wall Flashing is stocked by Revere sheet metal distributors throughout the United States.

ONE TYPE COVERS ALL CONDITIONS

One of the principal advantages of Revere Flashing is its adaptability. All styles and sizes of Flashing can be cut, bent and formed from this sheet by the sheet metal contractor.



FOR SPECIFICATION SEE PAGE 41 SPECIFICATION E

FLASHING SPECIFICATIONS

THRU-WALL

CHENEY FLASHING (16 oz.)—GENERAL SPECIFICATION

A

Thru-wall flashings shall be provided below parapet copings, for counterflashing in masonry parapets, where low roofs abut the superstructure, wherever flashing is set between two courses of masonry, and elsewhere as indicated on drawings. Thru-wall flashings shall be placed in the wall with mortar below and on top of flashing, so that a mechanical bond is obtained both vertically and horizontally. All counterflashing shall be bent to shape by the manufacturer. These flashings shall be CHENEY FLASHINGS (16 oz.) and shall be furnished and installed according to the standard specifications of THE CHENEY COMPANY, Architects Building, Philadelphia, Pa.

CHENEY FLASHING (16 oz.)—DESCRIPTIVE SPECIFICATION

B

Thru-wall flashings shall be provided below parapet copings, for counterflashing in masonry parapets, where low roofs abut the superstructure, wherever flashing is set between two courses of masonry, and elsewhere as indicated on drawings. Thru-wall flashings shall be placed in the wall with mortar below and on top of flashing so that a mechanical bond is obtained. Flashings shall be formed into dovetailed shaped flat corrugations of undercut sawtooth ribs extending transversely of the sheet and not over 3 inches apart, which shall provide a mechanical keybond in the mortar bed in three directions (longitudinally, transversely, and vertically). Crimped copper or deformed sheets which provide bond only in horizontal direction will not be accepted. The use of attached members either riveted or soldered to the flashing sheets will not be permitted, and the metal shall not be drawn, broken, stretched or perforated in any manner. The flashing shall be set in a bed of mortar and shall be shoved into place in a manner that will insure filling all deformations of the copper. All counterflashing shall be bent to shape by the manufacturer.

CHENEY FLASHING (16 oz.)—FOR EXPOSED WORK
THREE-WAY FLASHING (10 oz.)—FOR CONCEALED WORK } GENERAL SPECIFICATION

C

Thru-wall flashings shall be provided below parapet copings, for counterflashing in masonry parapets, where low roofs abut the superstructure, wherever flashing is set between two courses of masonry, and elsewhere as indicated on drawings. Thru-wall flashings shall be placed in the wall with mortar below and on top of the flashing, so that a mechanical bond is obtained both vertically and horizontally. All counterflashings shall be bent to shape by the manufacturer. All counterflashing and flashing exposed to the weather shall be Cheney Flashing (16 oz.). All concealed flashing shall be Three-Way Flashing (10 oz.) and shall be furnished and installed according to the standard specification of THE CHENEY COMPANY, Architects Building, Philadelphia, Pa.

CHENEY FLASHING (16 oz.)—FOR EXPOSED WORK
THREE-WAY FLASHING (10 oz.)—FOR CONCEALED WORK } GENERAL SPECIFICATION

D

Thru-wall flashings shall be provided below parapet copings, for counterflashing in masonry parapets, where low roofs abut the superstructure, wherever flashing is set between two courses of masonry, and elsewhere as indicated on drawings. Thru flashings shall be placed in the wall with mortar below and on top of flashing so that a mechanical bond is obtained. Flashings shall be formed into dovetailed shaped flat corrugations or undercut sawtooth ribs extending transversely of the sheet and not over 3 inches apart, which shall provide a mechanical keybond in the mortar bed in three directions (longitudinally, transversely, and vertically). Crimped copper or deformed sheets which provide bond only in horizontal direction will not be accepted. The use of attached members either riveted or soldered to the flashing sheets will not be permitted, and the metal shall not be drawn, broken, stretched, or perforated in any manner. The flashing shall be set in a bed of mortar and shall be shoved into place in a manner that will insure filling all deformations of the copper. All counterflashing shall be bent to shape by the manufacturer. All counterflashing and flashing exposed to the weather shall be of 16 oz. copper. All concealed flashing shall be of 10 oz. copper.

REVERE FLASHING—GENERAL SPECIFICATION

E

Thru-wall flashing shall be provided below the parapet coping, for counterflashing in masonry parapets and where low roofs abut the superstructure and elsewhere as indicated on drawings. That portion in the wall shall be bonded horizontally at intervals of not more than 3 in. by a series of ribs and raised projections $\frac{3}{16}$ in. high, with ribs extending the full width of the wall. End joints shall be interlocking and overlapping at least 2 in. so that a watertight joint is made without soldering. The flashing shall be Revere Thru-Wall Flashing (Revere Copper and Brass Incorporated) and shall be formed so as not to cause any accumulation of water on the horizontal surfaces and the transverse bonding ribs shall not be drawn or stretched.

SPANDREL WATERPROOFING

MASONRY. All exterior door or window openings in all concrete spandrel beams are to be provided with CHENEY FLASHING REGLETS by the sheet metal contractor. This contractor shall notify sheet metal contractor and cooperate with him so that he may place flashing REGLETS in the concrete forms of spandrel beams before forms are placed in position.

F

Refer to sheet metal specifications for description of this FLASHING REGLET.

Take precaution in the placing of concrete so that FLASHING REGLET does not become damaged in any manner.

SHEET METAL. Furnish and install over all door and window openings and all concrete spandrels at a point not more than 1 inch above top of vertical leg of angle Cheney Flashing Reglet. The contractor shall attach Cheney Flashing Reglets to the concrete forms of spandrel beams at the time these are erected by others and shall cooperate with contractor for this work, installing REGLETS before forms are put into place. REGLETS shall be attached to inside of wood forms with ¾ inch special copper double head nails (furnished with REGLETS). REGLETS shall extend 6 inches beyond each end of opening and shall be made of 16 ounce copper. Forty-five degree slot in reglet to be 1⅛ inches deep and with ¼ inch opening and the upper surface of slot to be of sawtooth design to provide self-locking means when copper counterflashing is inserted.

Furnish and install at all floor levels continuously around entire building a 16 ounce (or 10 ounce) thru-wall flashing. Flashings shall be formed into dovetail shaped flat corrugations or undercut sawtooth ribs, extending transversely of the sheet and not over 3 inches apart, which shall provide a mechanical keybond in the mortar bed in three directions, (longitudinally, transversely, and vertically). Crimped copper or deformed sheets which provide bond only in horizontal directions will not be accepted. The use of attached members, either riveted or soldered to the flashing sheets, will not be permitted, and the metal shall not be broken, drawn, stretched or perforated in any manner. The flashing shall be set in a bed of mortar and shall be shoved into place in a manner that will insure filling all deformations of the copper. Flashing shall turn up against columns not less than 2 inches and be made watertight with plastic cement.

Flashing Reglet and Thru-Wall flashing shall be as manufactured by the Cheney Company, Architects Building, Philadelphia, Pa.

Furnish and lock into flashing reglet as specified in concrete specification a 16 ounce copper counterflashing lapping over vertical leg of angle not less than 2 inches. Counterflashing shall be formed with ⅜ inch lip that self-locks into the flashing reglet and extends 4 inches beyond each end of all exterior door and window openings.

CONCRETE PARAPET

MASONRY. Install at all concrete parapets and other concrete walls rising above all roof surfaces at a point not less than 8 inches above finished roof a copper self-locking flashing reglet (furnished by sheet metal contractor). Reglet shall be attached to inside of wood form with ¾ inch double head smooth wire nails. Reglet shall be made of 16 ounce copper with 45 degree slot in reglet to be 1⅛ inches deep and with ¼ inch opening and the upper surface of slot to be of sawtooth design to provide self-locking means when copper counterflashing is inserted.

G

SHEET METAL. Furnish to concrete contractor for him to install in all concrete parapets and other concrete walls rising above all roofs a copper self-locking flashing reglet. Reglet shall be made of 16 ounce copper with a 45 degree slot in reglet to be 1⅛ inches deep and with ¼ inch opening and the upper surface of slot to be of sawtooth design to provide self-locking means when copper counterflashing is inserted.

Flashing reglet shall be as manufactured by the Cheney Company, Architects Building, Philadelphia, Pa.

Furnish and lock into flashing reglet as specified in concrete specification a 16 ounce copper counterflashing lapping over the base flashing not less than 4 inches. Counterflashing shall be formed with ⅜-inch lip that self-locks into the flashing reglet and ends of counterflashing shall overlap not less than 2 inches.

TERMITE PROTECTION

It is estimated that termites destroy some $50,000,000 worth of property annually in the United States. Although there are almost 2000 different species of these insects, approximately 95% of this damage is caused by one type called Subterranean Termites. Their habits are well known and it has been established that they require moisture in order to live. It has also been discovered that termites cannot build shelter tubes around the face edge of a metal sheet which projects outside of the adjacent construction. It is upon these facts, that the method of termite protection with copper shields has been developed.

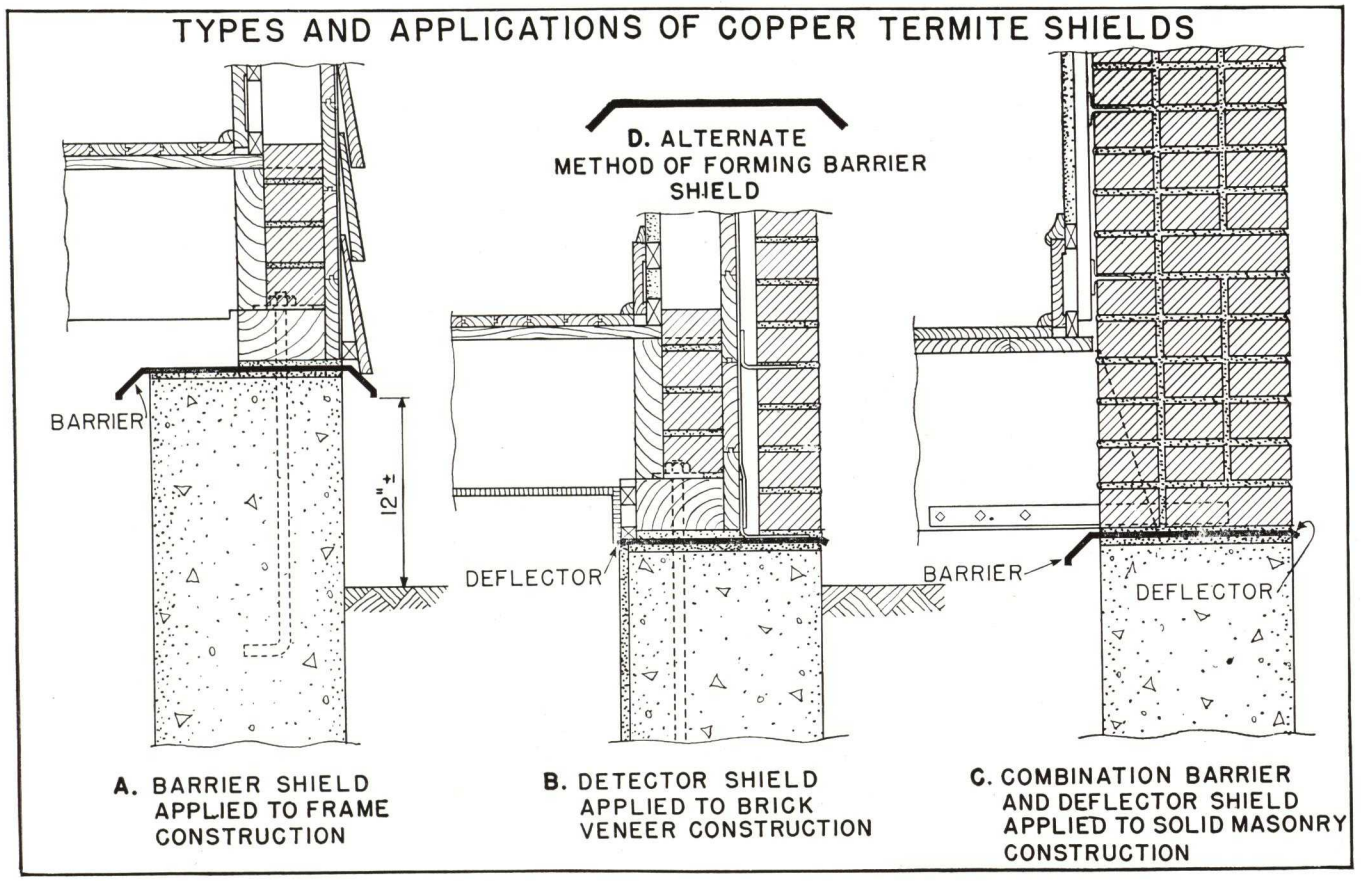
THE PRINCIPLE OF SHIELDING Termite protection with Copper Shields is accomplished by providing a continuous copper barrier between the foundation and the wooden portion of a building. The function of the shield is to prevent the termites from entering the building to destroy the wood which acts as their food supply. The shield also serves to break the contact between termites already in the building and the ground moisture necessary for their continued existence. Copper, with its ease of forming and its rustproof and corrosion resistant qualities, is the accepted material for shields that will give lasting protection.

BARRIER TYPE SHIELDS The most effective design for preventing the passage of termites is the Barrier Type which is illustrated below. The type shown at A, with the vertical turn-down edge, is preferable, but the type shown in detail D is also satisfactory and under certain conditions is easier to use. These shields formed from Revere Sheet Copper provide a lasting and impenetrable metal barrier. The sharp edge of the metal, either vertical or at 45° provides a 180° angle around which the termites are unable to construct a shelter tube.

DEFLECTOR TYPE SHIELDS The Deflector Type of Shield, illustrated at B, does not provide an impassable Barrier to the termite. It is used at points which are easily available to inspection, as at the interior wall of a basement recreation room, or on the outside where a brick porch abuts a wall.

In order to build a shelter tube from the ground moisture to the woodwork of a house, the termites will be forced out around the shield at the "point of detection." Then if the tubes are broken off the termites will die for want of moisture. This type of shield, plus inspection once or twice a year, gives satisfactory protection.

MATERIALS Revere 20 ounce Cold Rolled sheet copper is recommended for termite shields but 16 ounce Cold Rolled can be used satisfactorily. The forming can be readily done by the sheet metal contractor.



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Baltimore, Md.

DALLAS DIVISION
2200 No. Natchez Avenue
Chicago, Ill.

ROME DIVISION
Rome, New York

MICHIGAN DIVISION
5851 West Jefferson Avenue
Detroit, Mich.

TAUNTON-NEW BEDFORD DIVISION
24 North Front Street
New Bedford, Mass.

ROME MANUFACTURING COMPANY DIVISION
Rome, New York

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Pittsburgh, Pa.
727 Gulf Bldg.

Philadelphia, Pa.
1201 Architects Bldg.
17th and Sansom Streets

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626 E. Wisconsin Avenue

Atlanta, Ga.
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1110 Midland Bldg.

Cincinnati, Ohio
2616 Carew Tower

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922 Grand Rapids National Bank Bldg.

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425 Decatur Street

Los Angeles, Calif.
124 W. Fourth Street

San Francisco, Calif.
562 Russ Bldg.

Houston, Texas
Second National Bank Bldg.

Boston, Mass.
United Shoe Machinery Bldg.
140 Federal Street

Hartford, Conn.
209 Capitol National Bank Bldg.
410 Asylum Street

Minneapolis, Minn.
724 Metropolitan Bank Bldg.

St. Louis, Mo.
955 Telephone Bldg.
1010 Pine Street

Dallas, Texas
1314 Tower Petroleum Bldg.

Seattle, Wash.
317 Pioneer Bldg.

Revere Copper *and* Brass

FOUNDED BY PAUL REVERE

1801

INCORPORATED

Executive Offices: 230 PARK AVENUE, NEW YORK CITY

SECTION 6

CONTINUED ⟶

THE AMERICAN BRASS COMPANY

GENERAL OFFICES
WATERBURY, CONNECTICUT

MANUFACTURING PLANTS

ANSONIA, CONNECTICUT
BUFFALO, NEW YORK
TORRINGTON, CONNECTICUT
DETROIT, MICHIGAN
WATERBURY, CONNECTICUT
KENOSHA, WISCONSIN

OFFICES AND AGENCIES IN PRINCIPAL CITIES

IN CANADA: Anaconda American Brass Limited, NEW TORONTO, ONT.

For Other Pages, see File Index

ANACONDA THROUGH-WALL FLASHINGS

(Patented May 2, 1936—Pat. No. 1,906,674)

"The Flashing That Drains the Water from the Walls"

ANACONDA from mine to consumer
REG. U.S. PAT. OFF.

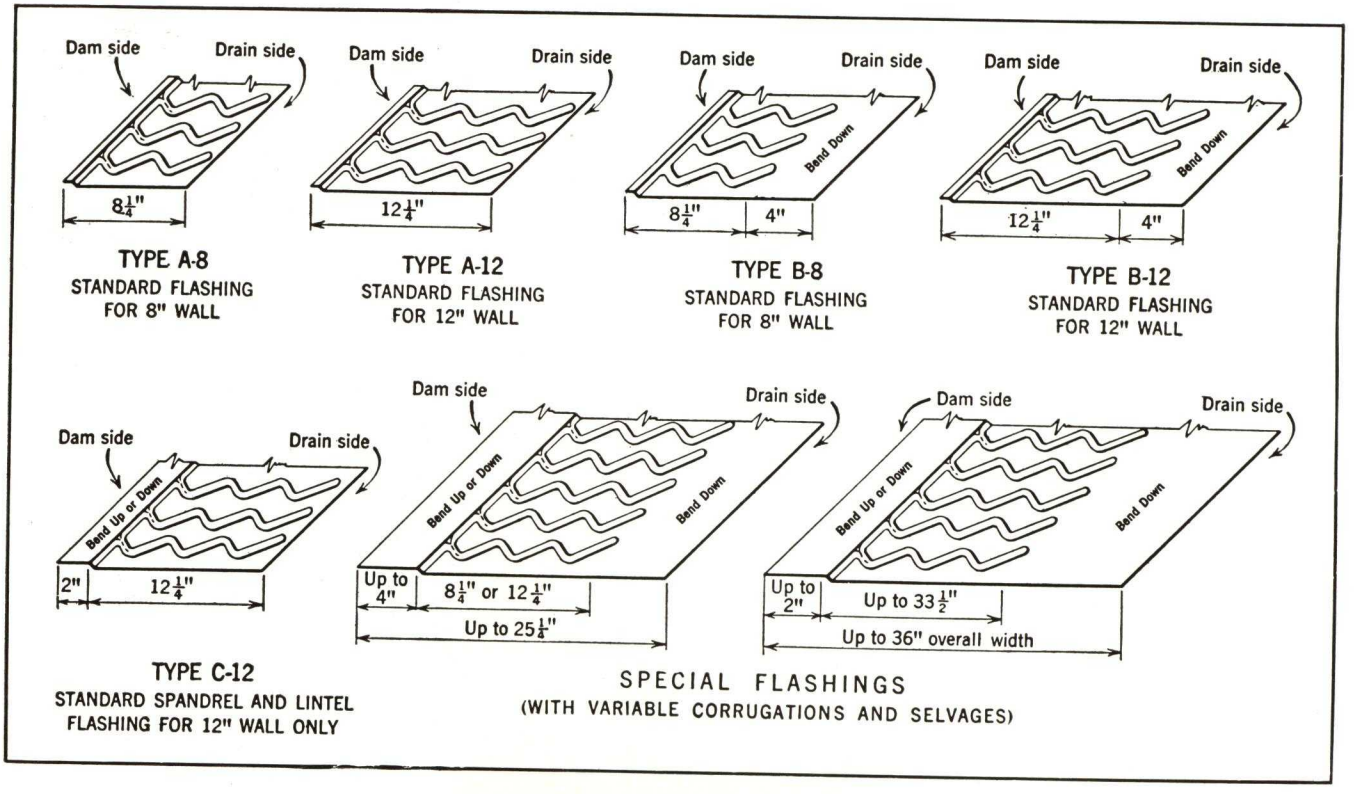
ANACONDA Through-Wall Flashing is efficient, positive, durable, yet relatively inexpensive. It is readily adaptable to practically every masonry condition. The principal feature of its design consists of a series of zig-zag ridges 7/32 in. high intersected at one end by a 7/32-in. longitudinal ridge which acts as a dam, causing any accumulation of water to flow to the opposite face of the wall.

DRAINS DRY ON LEVEL BED

The zig-zag ridges prevent lateral movement in any direction. The possibility of vertical movement may be disregarded, as a properly designed masonry wall has its mass and weight so proportioned in relation to wind and other forces that uplift does not occur under any normal conditions, except as a result of heaving by frost. If this heaving were of sufficient force to cause vertical movement of the wall or coping, it would be sufficient to break the bond between masonry, mortar and flashing of any design. Actually, the Anaconda Through-Wall Flashing assures minimum risk of heaving by frost as it is *so designed that it will drain on a level bed.*

PROTECTS MORE OF WET PORTION OF WALL

The design of the dam is such that the edge of the flashing can be placed within ¼ in. of the face of the wall and still provide sufficient bed for the pointing of the mortar joint so that it will not chip out. Thus, the ANACONDA Flashing protects more of the wet portion of the wall than is possible with the usual types of turned back dams.



TYPES AND SIZES AVAILABLE

This flashing, available in a variety of types and sizes, as shown in the sketches below and on the preceding page, is made of ANACONDA 16-oz. Copper, either plain or lead coated.

ANACONDA Through-Wall Flashing for 8-in. and 12-in. walls is stocked in 5-ft. and 8-ft. lengths. Special ANACONDA Through-Wall Flashing is available on order in all widths up to and including 36 in. with the corrugated area any width up to and including 33½ in. and the flat selvage on the dam side any width up to 2 in. When the corrugated area is exactly 8¼ in. or 12¼ in. wide, and the over-all width not more than 25¼ in., special flashing is also available with a flat selvage on the dam side any width up to and including 4 in.

EASILY INSTALLED

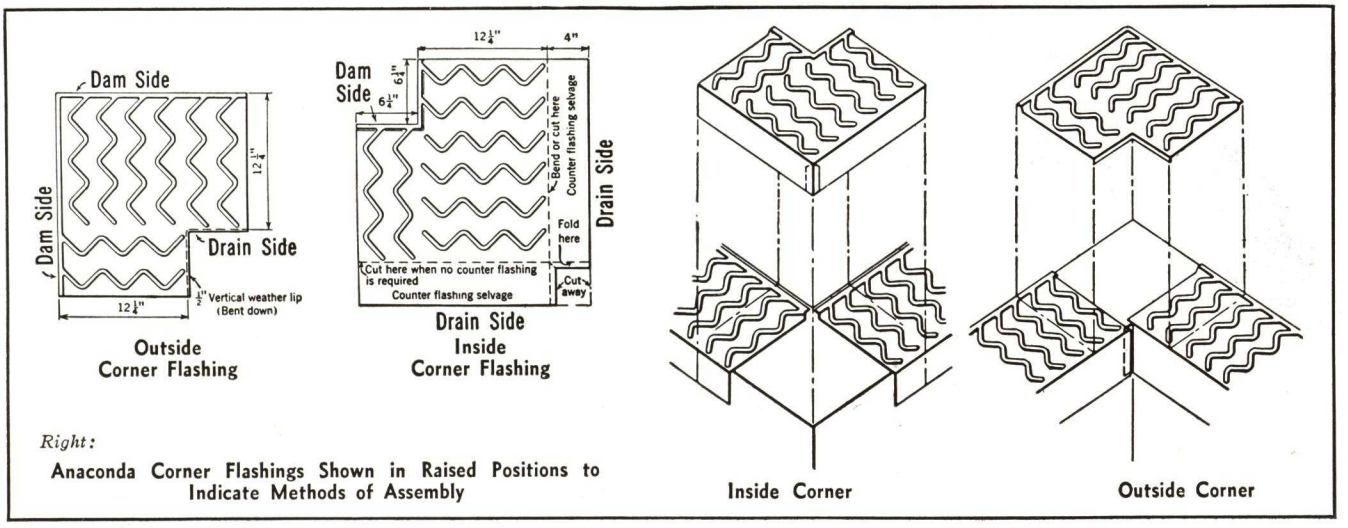
Because it can be bent and cut to fit on the job, ANACONDA Through-Wall Flashing can be installed easily and quickly, with a minimum of delay to bricklayers and masons. Tight end joints can be made by overlapping one or two corrugations. When specified, solder is easily applied to the flat ends.

CORNER FLASHING

One-piece inside and outside corner flashings are now available for both 8-in. and 12-in. walls. Both types are illustrated below. They are so designed that the corrugations will interlock with those of adjoining straight flashings, thus providing the same thorough flashing at the corners of the building that straight ANACONDA Through-Wall Flashing provides in the main part of the wall. These corners eliminate soldered mitre joints or bulky laps.

SIMPLICITY OF INSTALLATION

A corner is flashed by first assembling the three flashing pieces, then marking their exact position on the masonry. The pieces are then removed and a thin bed of mortar spread on the wall after which the straight flashings are laid and settled into the mortar, causing it to work up into the corrugations. The corner flashing is put on last, lapping the straight flashings by two corrugations. The vertical corner is made watertight by cutting and bending the counter flashing as shown in illustration. On outside corners, the selvage for counter flashing is provided on the straight flashing; for inside corners, it is on the corner unit. Note that each outside corner unit has a ½-in. weather lip which laps over the counter flashing and covers the pinhole at the very corner.



Right:
Anaconda Corner Flashings Shown in Raised Positions to Indicate Methods of Assembly

SUGGESTED SPECIFICATION—THROUGH-WALL FLASHING

Through flashings shall be of copper sheets, and shall be specially formed to bond in the mortar bed and prevent lateral movement in both directions. The bonding features shall occur at intervals of not more than 3 in. and shall be a series of ribs extending transversely of the sheet or a series of ribs and raised projections, or similar features of equivalent efficiency. The metal shall be so formed as not to cause any accumulation of water on the surface and shall not be broken or perforated in any manner. The end joints shall be so lapped and locked that water will not leak through. Copper Through Flashings shall be lead coated where they will come in contact with any metal other than copper or lead.

Additional advantages of ANACONDA *Through-Wall Flashings are described in* ANACONDA *Publication AC-28. Will be mailed upon request.*

THE CHENEY COMPANY

Cheney Flashing

Architects Building, PHILADELPHIA, PA.

BRANCH OFFICES

NEW YORK, N. Y., 75 E. 45th Street — CHICAGO, ILL., 2200 Natchez Avenue

FACTORY: 24 North Front Street, NEW BEDFORD, MASS.

Products

Cheney Flashing (16 oz.); Three-Way Flashing (10 oz.); Revere Flashing; Cheney Flashing Reglet; Cheney Shower Pan; Vertical Ribbed Siding; Copperkote and Spando Waterproofing.

CHENEY

Service

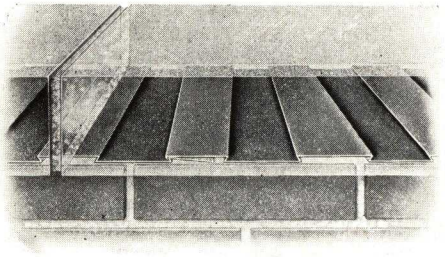
THE CHENEY COMPANY has made an exhaustive study of all kinds of seepage and flashing problems and the services of our field engineers are always available to architects and opportunities for being of service are welcomed.

REVERE COPPER AND BRASS, INCORPORATED

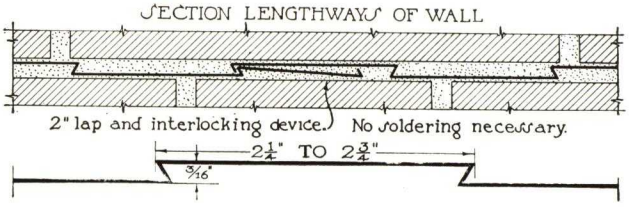
Are sole sales agents for the following Cheney products: CHENEY FLASHING (16 oz.); THREE-WAY FLASHING (10 oz.); REVERE FLASHING; CHENEY FLASHING REGLET; CHENEY VERTICAL RIBBED SIDING.

See Revere Catalogue for complete details.

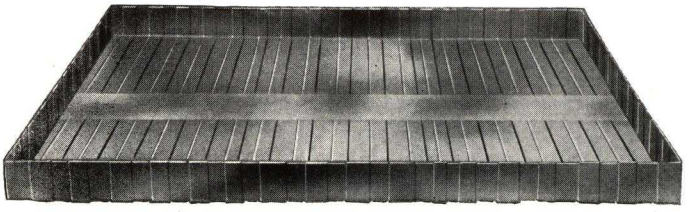
CHENEY FLASHING



Phantom View Thru the Wall

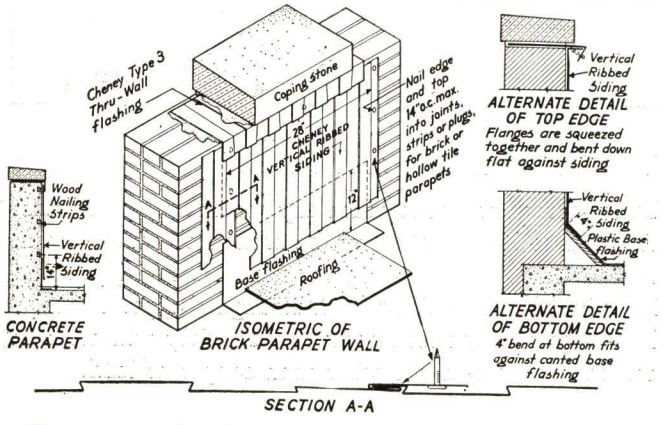


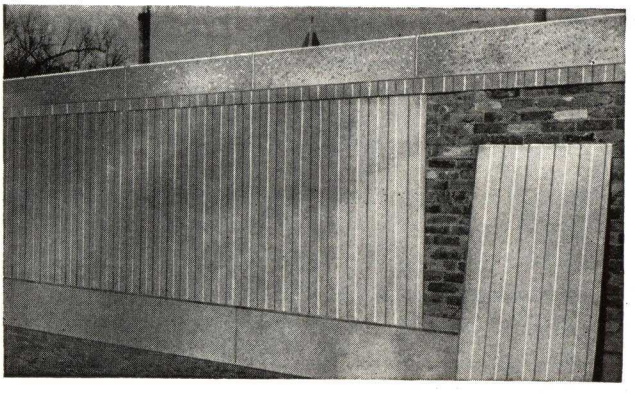
CHENEY SHOWER PANS



Made of Cheney Flashing and strongly constructed of 16 oz. copper with reinforced locked and sweated corners. Keys absorb expansion and contraction strains and form a perfect bond with the mortar. Made at the factory to exact detail and shipped ready to install. Far superior and less expensive than the usual 6 lb. lead pan which corrodes so quickly and punctures so easily.

CHENEY VERTICAL RIBBED SIDING





Very attractive in appearance and provided with a watertight expansion joint. Extremely rigid, quickly installed and usually requires about one-tenth the labor necessary to install standing seam copper. Made of 16-oz. copper. Used for lining inside of high parapets, on sidewalls of monitors, penthouses, etc.

CHASE BRASS & COPPER CO.

—INCORPORATED—

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

WATERBURY, CONN.

For Other Chase Pages, see File Index

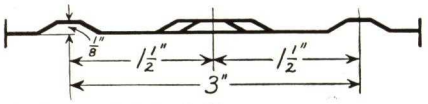
CHASE THRU-WALL COPPER FLASHING AND CHASE COP-O-TOP

Chase Thru-wall Flashing is a flashing installed entirely through masonry walls. It is made of 16-oz. copper with embossed ridges which are designed to direct the flow of water to the face of the wall. This prevents leaks, plaster stains, peeling paint, efflorescence, and expensive rebuilding of parapet walls due to breaking down of mortar joints.

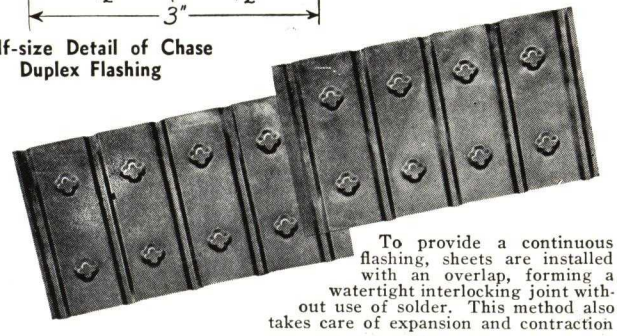
Chase Thru-wall Flashing is furnished in two types—Threplex and Duplex. Architects should specify Chase Threplex when a full mechanical key bond flashing is wanted and Chase Duplex when a two-way bond flashing is wanted.

Chase Thru-wall Flashing should be ordered lead coated when flashing extends to or over the outside face of the wall directly in contact with marble, limestone or any light colored stone.

DUPLEX
Bonds in All Lateral Directions



Half-size Detail of Chase Duplex Flashing



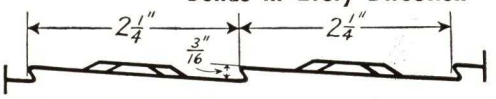
To provide a continuous flashing, sheets are installed with an overlap, forming a watertight interlocking joint without use of solder. This method also takes care of expansion and contraction

When installed, the general design of the Chase Duplex Thru-wall Flashing provides a bond in all lateral directions. The raised ridges, to prevent right or left movement, are 3 in. apart and run the full width of the sheet. This construction directs water seepage directly to the outside wall. Another advantage is that when a counterflashing is formed, the ridges offer much greater resistance to being blown up by the wind than does plain copper. Forward and backward movement is prevented by a row of embossings 4 in. apart located between the ridges.

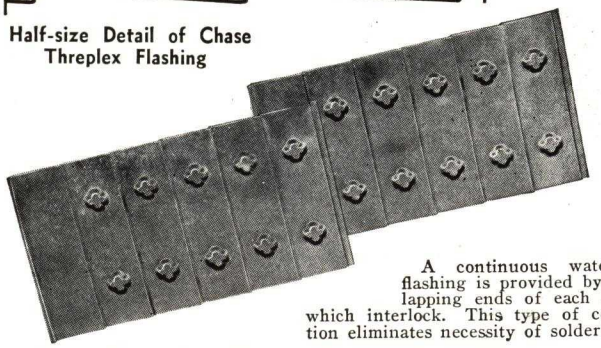
Specifications

All flashings installed through masonry walls shall be Chase Duplex Thru-Wall Flashing as manufactured by the Chase Brass & Copper Co. Flashings shall be of 16-oz. copper with formed ribs at intervals of not more than 3 in. and raised projections 3/16 in. high, the ribs to extend the full width of the flashing. End joints shall be interlocking and overlapping at least 2 in. so that a watertight joint is made without soldering. The flashings shall be formed so as not to cause any accumulation of water on the horizontal surfaces and the transverse bonding ribs shall not be drawn or stretched.

THREPLEX
Bonds in Every Direction



Half-size Detail of Chase Threplex Flashing



A continuous watertight flashing is provided by overlapping ends of each length which interlock. This type of connection eliminates necessity of soldering

Chase Threplex Thru-wall Flashing will meet specifications calling for flashings that will bond in the mortar bed to resist movement in all directions, vertical as well as lateral. Chase Threplex Flashing consists of a series of "Z" bends which provide perfect drainage, as each "Z" bend forms a small weep hole. It also provides for adequate expansion and contraction at each "Z" bend.

Specifications

All flashings through masonry walls shall be Chase Threplex Thru-Wall Flashing as manufactured by the Chase Brass & Copper Co. Flashings shall be of 16-oz. soft copper formed into a series of ribs shaped to a sawtoothed design at intervals of not more than 2½ in. with a row of embossings between ribs to provide a mechanical key bond in all directions—longitudinally, transversely and vertically. End joints shall be interlocking and overlap at least 3 in. so that a watertight joint is made without soldering.

CHASE COP-O-TOP

Chase Cop-o-top is recommended for waterproofing heads and sills of windows, spandrel beams, and many other places in masonry construction where flashing is not exposed, and where first cost is a vital factor. For residences, Cop-o-top is recommended for sheathing side walls, roofs and attics to prevent infiltration of air, dust, and dampness. It is also recommended for dampproofing cellars and foundations, and for protection against termites and other vermin.

Chase Cop-o-top consists of one layer of thin sheet copper 1, 2, or 3 oz., and 1, 2, or 3 layers of asphalt saturated creped paper. All layers are strongly bonded with asphalt to form a single sheet that is extremely tough and flexible, and may be handled freely without tearing, kinking, cracking, or puncturing. It can be folded and formed by hand to fit into nooks and corners, and around odd shapes without breaking. Cop-o-top is installed quickly and easily as the masonry progresses. It is laid with the copper side up.

These features, together with the corrosion-resistant advantage of copper, make Cop-o-top especially practical for all types of waterproofing and dampproofing.

MAJESTIC FLASHING COMPANY

Manufacturers of Majestic Three-Way Super-Bond Flashing

Reisterstown Road at Elgin Avenue

BALTIMORE, MD.

Strength of Bond

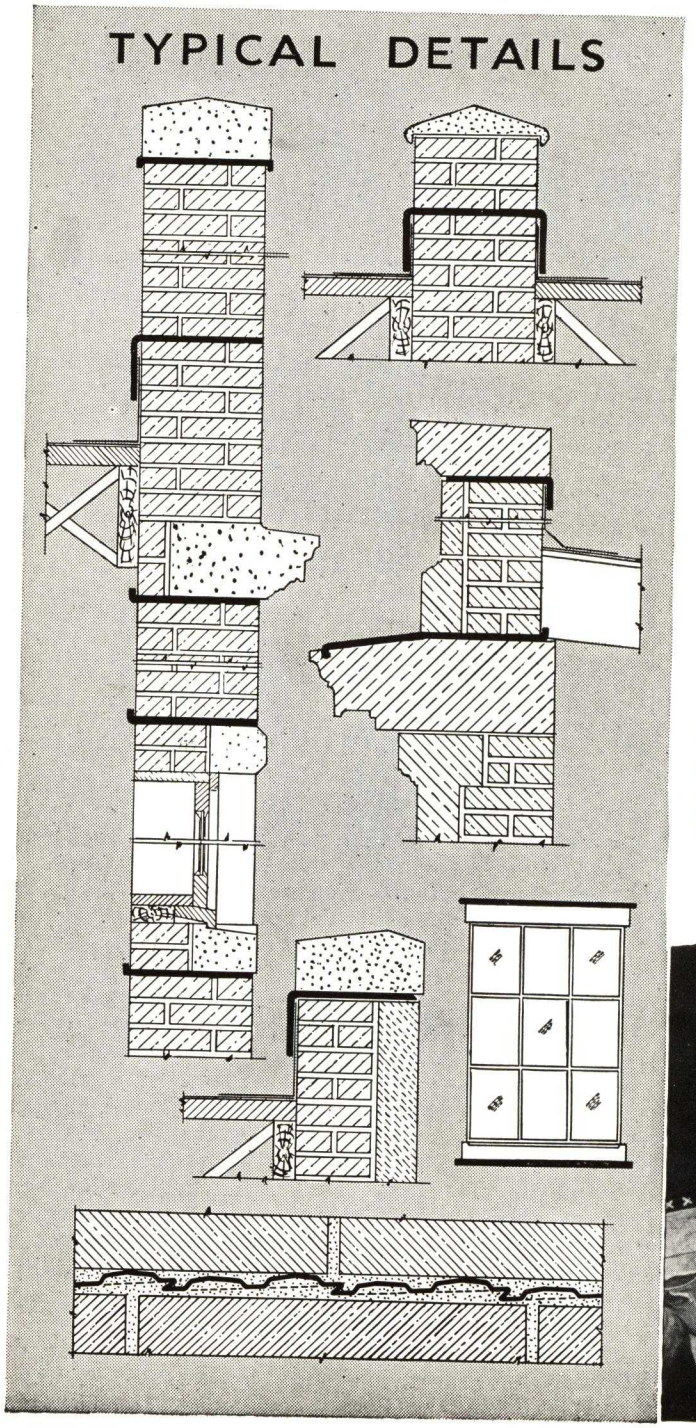
Any flashing will, to a certain extent, stop seepage. But the bond between flashing and mortar can be strong only if the flashing is properly keyed. Flashing is not worth the investment unless it bonds in every direction.

The keyed surfaces of Majestic Flashing, bonded securely to the mortar, are an impenetrable barrier and your assurance against seeping moisture, disintegration and future expense.

MAJESTIC
REG. U.S. PAT. OFF.

Bonds in Every Direction

The cut-back feature of Majestic 3-Way Super-Bond Flashing not only provides all the bonding quality of ordinary keyed flashing, but it drains seepage, directing weeping from the masonry surface into gutters where it belongs. Actual tests prove Majestic 3-Way Super-Bond Flashing resists stress and strain in every direction—forms a perfectly rigid bond between flashing and mortar. Majestic 3-Way Super-Bond Flashing is interlocking—quickly, easily, securely made a part of the masonry. No danger of mashing the keys while setting large blocks—all keys are designed to bear part of the weight, preventing mashed cut-backs. Handling is facilitated by a wide range of standard sizes and shapes in the Majestic line, as shown in typical details illustrated on this page. Majestic 3-Way Super-Bond Flashing is made of Hussey Lake Copper of uniform quality and proof against corrosion by moisture.



Specifications

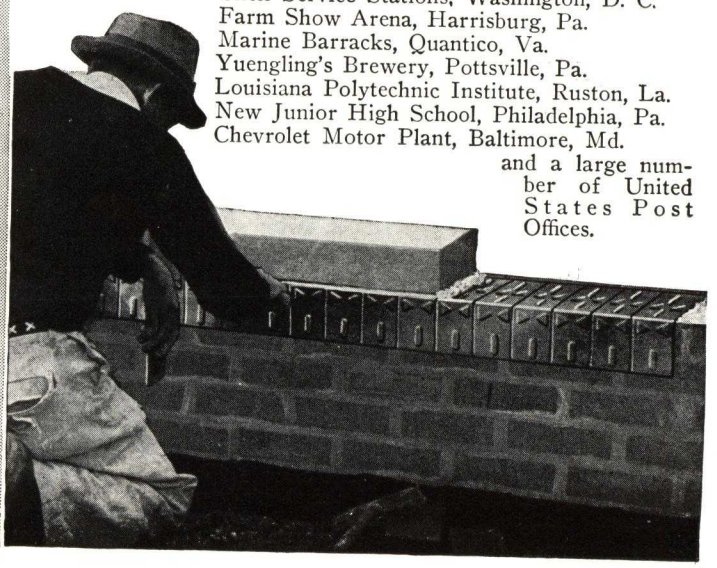
All through-wall and counterflashing shall be 3-Way Interlocking type as manufactured by MAJESTIC FLASHING COMPANY, Baltimore, Md., and installed in strict accordance with the manufacturer's specifications with mortar below and on top so that a perfect mechanical bond is obtained.

Distributors

Majestic 3-Way Super-Bond Through-Wall Flashing is distributed nationally by C. G. Hussey & Co., Main Office, Pittsburgh, Pa. Write for further details and the name of your nearest dealer.

A Few Typical Installations

Federal Reserve Building, Washington, D. C.
New Charity Hospital, New Orleans, La.
State Finance Building, Harrisburg, Pa.
Bolling Field Hangar, Bolling Field, D. C.
Indiana State Teachers College, Indiana, Pa.
Norristown State Hospital, Norristown, Pa.
Pennsylvania R.R. Pier, Baltimore, Md.
Huey P. Long Bridge, New Orleans, La.
Archives Building, Washington, D. C.
Addition to Library of Congress, Washington, D. C.
Woodville County Home, Pittsburgh, Pa.
Glenn L. Martin Co. (Airplane Manufacturers), Baltimore, Md.
Ford Motor Co. Assembly Plant, Norfolk, Va.
Kress Building, Okmulgee, Okla.
Ithaca State Hospital, Ithaca, N. Y.
Shell Service Stations, Washington, D. C.
Farm Show Arena, Harrisburg, Pa.
Marine Barracks, Quantico, Va.
Yuengling's Brewery, Pottsville, Pa.
Louisiana Polytechnic Institute, Ruston, La.
New Junior High School, Philadelphia, Pa.
Chevrolet Motor Plant, Baltimore, Md.
and a large number of United States Post Offices.



ROOF SPECIALTIES CO.

PITTSBURGH, PA.

"WEE-PER" THRU-WALL FLASHING

"The Flashing with the Weep-holes"

Description

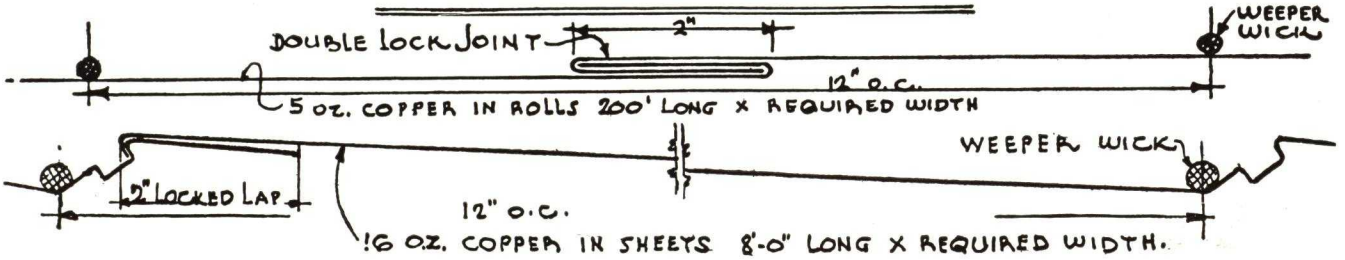
"Wee-per" Thru-Wall Flashings at once afford a practical, economical and scientifically designed means to lock mechanically the mortar bond, and to solve the important problem of masonry seepage and drainage.

"Wee-per" Thru-Wall Flashings prevent leaks, costly maintenance, disintegration of walls and rusting of steel spandrels and lintels and retard efflorescence.

WEEPER
U. S. Patent No. 1,935,116
TRADE-MARK

"Wee-per" Thru-Wall Flashings are made of 5-oz. and 16-oz. copper; 5-oz. for concealed flashings Types A, B, and C; 16-oz. for exposed Types D, E, and F.

Specially woven wicks are attached to the flashing and deteriorate after installation, forming weep-holes in the mortar joints, thus providing constant and positive drainage. During the process of deterioration the wicks function through capillary attraction.

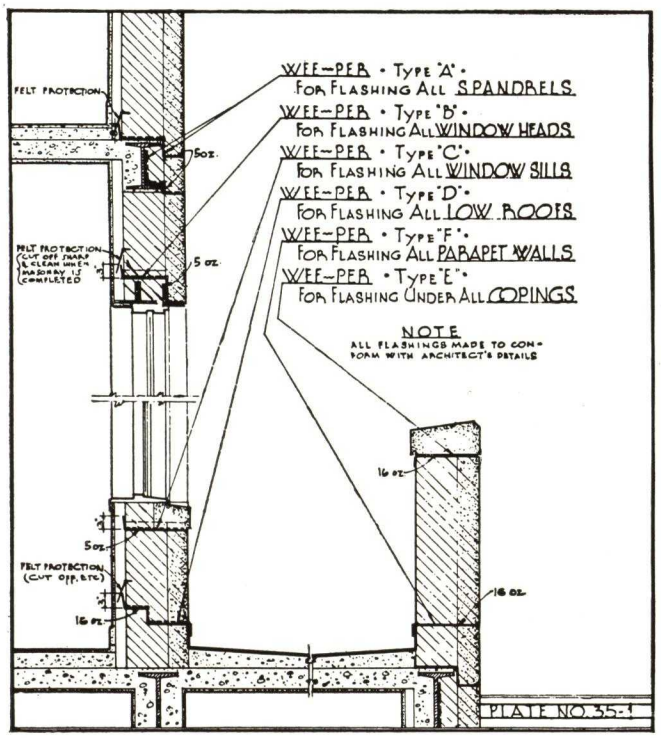


SPECIFICATION FOR "WEE-PER" FLASHING

Under Mason Specifications

Lintel-Spandrel-Sill Thru-Wall Flashing—

Lintels—For all exterior openings to be copper-flashed completely through the wall beginning at a point 1 in. back of outside face and covering steel as detailed to inside face of wall where flashing is to be turned up 3 in. Flashing to extend from end to end of steel.



Spandrels—To be copper-flashed in two continuous courses as detailed. Upper course to begin at inside face of wall where 3-in. turnup is to be provided, and extend past outside flange of Spandrel beam at which point flashing is to drop down two courses of brick and extend out to within 1 in. of outside face of wall. Lower course of Spandrel flashing to be installed against web of beam and to begin at a point 2 in. higher than lower step of upper flashing course and extend down to lower flange of beam and then out to within 1 in. of outside face of wall. Joints to be double locked; finished lock to be not less than 2 in. wide.

Sills—For all exterior openings to be copper-flashed in form of pan providing 2-in. turnup at end of sills and 3-in. or more turnup at back of sills.

Lintel-Spandrel-Sill Flashing—To be 5-oz. copper "Wee-per" flashing as manufactured by ROOF SPECIALTIES CO., Pittsburgh, Pa.

Flashing Protection—Mason to provide protection for Thru-Flashing against mortar droppings by nailing lath strips into mortar joints, without piercing flashing, at the turnup back of wall. After masonry is completed, mason to remove lath strips and dress-back copper turnup leaving 1-in. clearance between copper and wall to form gutter.

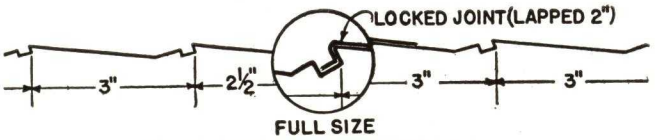
All Thru-Wall flashing to be installed in accordance with specifications of and under supervision of manufacturer and to be accepted only upon submission of manufacturer's certificate of approval.

Under Sheet Metal Specifications

Thru-Wall Counterflashing—All Thru-Flashing in parapet walls and where low roofs abut standing walls to be 16-oz. copper Thru-Wall flashing providing mechanical key-bond and weephole-forming means for positive drainage and to be "16-oz. Wee-per" flashing as manufactured by ROOF SPECIALTIES CO., Pittsburgh, Pa.

"TRI-LOK" THRU-WALL FLASHING

"Tri-Lok" Thru-Wall flashing overcomes the loss of mortor bond where a Thru-Wall flashing is used by providing a mechanical, interlocking three-way key on 3-in. centers against all wall movement—longitudinal, transverse and vertical. It does not provide drainage.



Detail of "Tri-Lok" Thru-Wall Flashing

TURNER RESILIENT FLOORS, INC.

Sole Licensee in U. S. A. for The Byers Flashing

737 North Michigan Ave., CHICAGO, ILL.

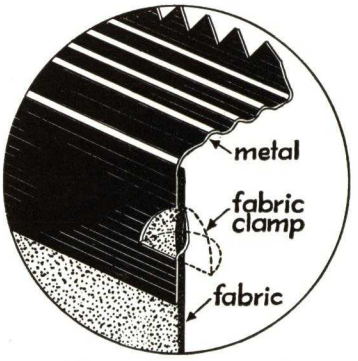
SALES OFFICES IN PRINCIPAL CITIES

DESCRIPTION—The Byers Flashing consists of a sheet metal counter flashing member which is easily and economically inserted in a standard flashing raggle after the built-up roofing is in place. To the apron of the flashing is readily attached, on the job or in the shop, any felt or fabric apron to complement the built-up roofing specified (see self-locking feature). Its many obvious advantages are set forth below and in the accompanying details.

ADAPTABILITY—It is admirably adapted to use in both old and new work as a corollary to any type of built-up roofing.

METALS AVAILABLE—Standard units nine (9) ft. long are obtainable in 24 gauge, galvanized, copper-bearing steel and 16-ounce cold rolled copper.

The **BYERS** **FLASHING**



"Locks itself in the wall every inch of the way"

On special order it can be furnished in any kind of metal for special conditions, such as industrial plants where sulphur fumes and other gases attack copper or galvanized iron.

RECOMMENDED FELT—The manufacturer of The Byers Flashing recommends the use of 90-lb. slate surfaced, coal tar pitch saturated felt. Most roofers use 90-lb. slate surfaced felt shingle starter strip for this purpose, because it comes in 36-foot rolls, 8, 9, or 12 inches wide—perfect for attaching without further cutting or preparation.

RAGGLES REQUIRED—The Byers Flashing can be quickly and easily installed in a raked out joint in old brick or stone walls; a dry joint left in new brick or stone walls; raggles cut in old concrete walls or raggles "formed" in new concrete walls (see detail).

OUTSTANDING ADVANTAGES

MEETS BONDED ROOFING REQUIREMENTS—By attaching the particular felt or fabric recommended by the manufacturer of the roofing materials being used on the job, The Byers Flashing can be included in the 10 or 20-year Bond or Maintenance Agreement—thus the flashing becomes, as it should, an integral part of the protective roof covering guaranteed by one responsible party—the roofer.

CENTRALIZED RESPONSIBILITY—Other than providing the open raggles in the masonry parapet, penthouse, and similar walls, the mason contractor has nothing to do with the flashing member. The flashing as well as the roof covering is installed by the Roofing Contractor with undivided responsibility. No metal work, prone to damage and abuse is "built in" with the masonry.

ECONOMY—The installation requires no special skill or tools. The self-locking feature for attaching the felt or fabric flashing member reduces the labor cost to a minimum.

The felt or fabric can be adjusted to variations in the level of the roof without special attention to exact location of the raggle.

Wedges, springs, and other non-permanent, time-consuming devices for retaining the flashing in the raggle are entirely eliminated.

SIMPLE TO INSTALL—All that is required in installation is to force the toothed flange into the raggle with a flat bladed instrument, such as a wide, blunt chisel. Then fill the raggle with caulking compound or roofing cement.

PERMANENT—Due to the small surface of metal exposed to the weather and temperature changes, expansion and contraction are minimized. While the teeth prevent any outward movement, they are so arranged as to permit the very slight sidewise movement occurring during wide temperature ranges.

By combining metal and fabric at the "vital point" the weakest point of the "all-fabric" flashing is protected and safeguarded. In ordinary installations, the bituminous saturant is prone to evaporate leaving only the weakened base material to resist the strain at the top at its attachment to the masonry wall.

The corrugations on the inserted member permanently hold the roofing cement or caulking compound in place.

FLEXIBILITY OF DESIGN—The accompanying details show the ease with which this single member is adapted to fit every roofing contingency in a neat, finished manner.

GOOD APPEARANCE—The Byers Flashing is not applied until just before the application of the top roof coating. Removed just prior to use from their shipping carton, they are straight and true and in perfect condition when installed.

SPECIFICATIONS

ROOF COUNTERFLASHING—All masonry walls intersecting the plane of the roof decks shall be counterflashed with The Byers Flashing (Turner Resilient Floors, Inc., Sole Licensee in U. S. A.). The flashing shall be of the standard composite type consisting of *(24 gauge galvanized, copper bearing sheet steel) (16 ounce cold rolled copper) (specific special metal)* with apron of *(specify special brand or trade name)* or equivalent 90-lb. slate surfaced felt.

NOTE: *Specify galvanized steel for 10-year bonded roofs and copper for 20-year bonded roofs.*

After attaching the felt or fabric apron to the metal in accordance with the manufacturer's directions, insert the metal flange in the masonry raggle, mop or cement the apron to the base flashing in accordance with the roofing manufacturer's directions and fill the raggle with *(specify brand) (caulking compound) (roofing cement).*

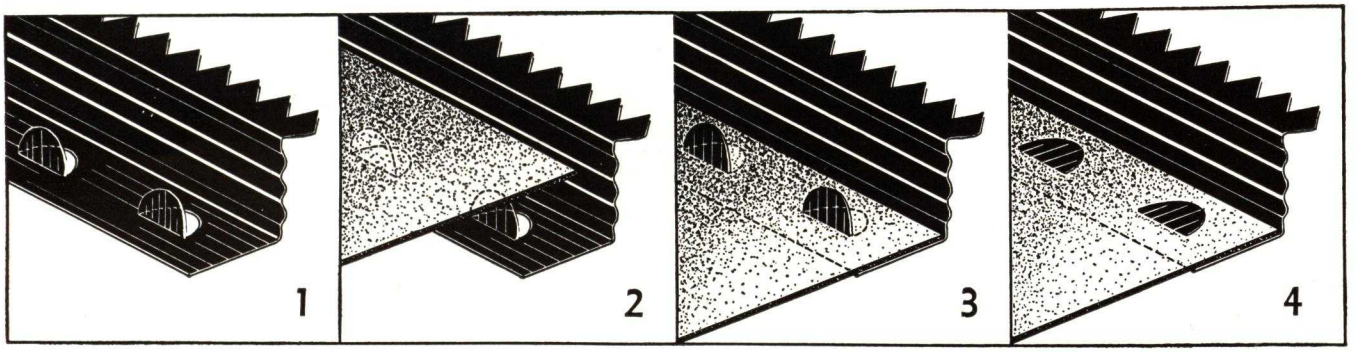
PREPARATION—(a) ***On Existing Work***—The Roofing Contractor shall *(rake out) (cut)* the necessary raggles to receive the counterflashing.

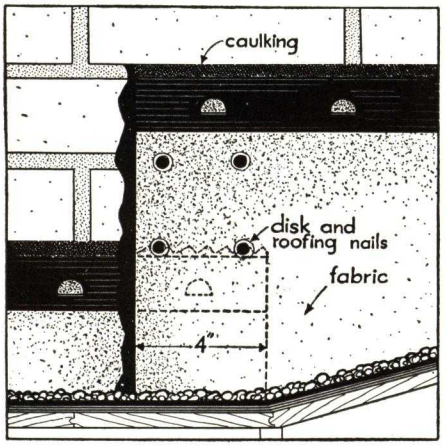
(b) ***On New Work***—The Roofing Contractor shall locate for the Masonry Contractor the position and extent of raggles required to receive the counterflashing.

(c) Raggles shall be not less than 1½ in. in depth nor more than ⅝ in. high.

NOTE: *Drawings and details should call for raggles to be about 8 inches above the roof deck, stepped as required.*

DETAILS OF FABRICATION AND INSTALLATION FOR BYERS FLASHING



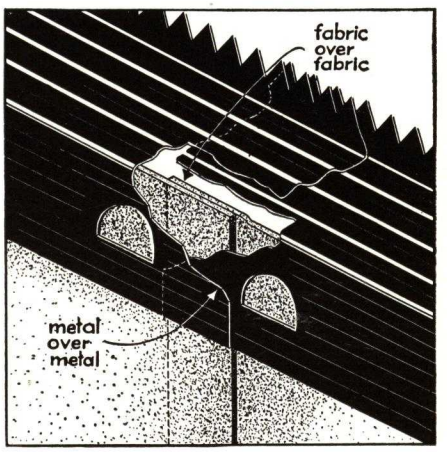


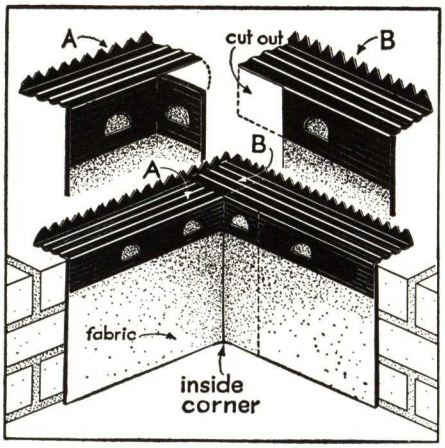
ABOVE—FABRICATION STEPS

(1) Lay metal portion face down on bench or plank. **(2)** Lay felt (slightly warmed) over lock clips with top edge against metal. **(3)** Pound felt with wooden mallet or block till lock clips are clear through. **(4)** Bend lock clips over till they "bite" into felt.

AT LEFT TOP—CHANGES IN LEVELS—Use the same method as with metal flashings except that the felt is mopped to the wall and secured with large headed roofing nails. The top felt should be long enough to lay out on the roofing.

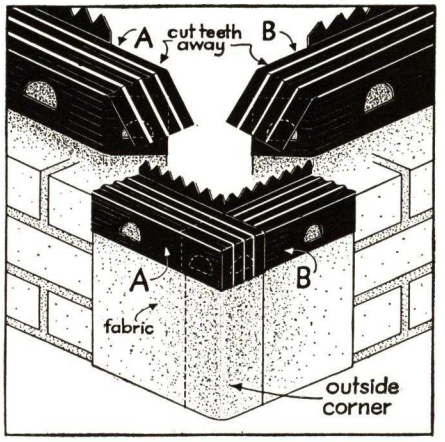
AT RIGHT TOP—END LAPS—Lap should be about 2 in. with felts mopped or cemented. Telescoping must be done before forcing into the raggle.



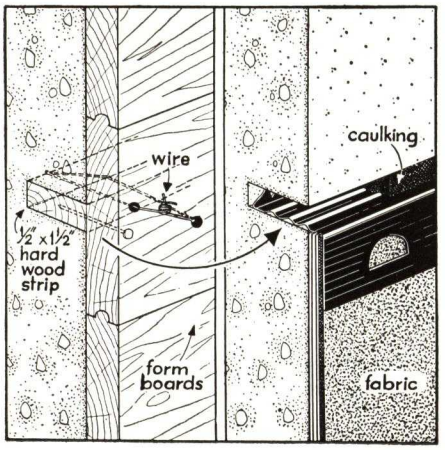


AT LEFT CENTER — INSIDE CORNERS—The piece "A" is cut and bent out at the proper angle. It is installed first. The piece marked "B" is cut out and installed over piece "A" making a lap of approximately 1½ in.

AT RIGHT CENTER—OUTSIDE CORNERS—The toothed flange is cut off for a distance of about 3 in., the metal cut, bent in, and lapped over. Piece "B" is installed first and then piece "A" is installed over piece "B" forming a lap of approximately 1½ in. each way from the corner.

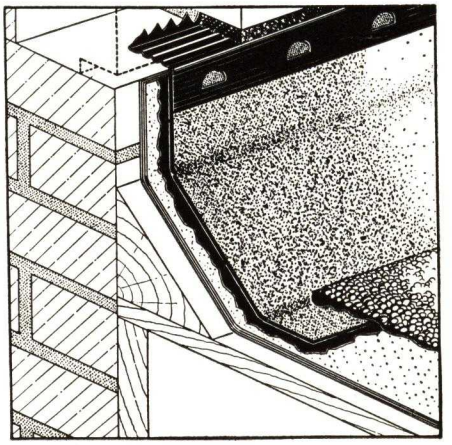


AT LEFT BOTTOM — WHEN USED IN CONCRETE WALLS—Strips of *hardwood* ½ in. x 1½ in. are oiled and nailed to the forms. In addition, they are wired at 16 to 20 in. centers with No. 14 annealed wire.



AT RIGHT BOTTOM — WHEN CANT STRIPS ARE USED—This illustration shows the preferred detail for roof installations where either wood or concrete cants are used in the construction of the deck. Opinion seems to be divided regarding the value of cants. Some architects and roofers insist on their use and others are just as insistent that they be omitted.

The advantages of The Byers Flashing remain the same in either case.



WASCO FLASHING CO.

268 Elm Street, CAMBRIDGE, MASS.

SOLE LICENSEE MANUFACTURERS FOR MIDDLE, SOUTH CENTRAL AND WESTERN STATES

BARLEY-EARHART CORP.

535 W. Jefferson Avenue, DETROIT, MICH.

WASCO THRU-WALL COPPER-FABRIC FLASHING

Wasco Flashing is a specially developed thru-wall material of *dual* construction. It completely seals all joints and provides a continuous, permanent water barrier. It is tightly embedded and sealed in the brickwork and becomes integral part of the mortar joint.

This efficient flashing is readily installed over all foundation walls, spandrel beams and heads; also under belt courses, sills, all projecting courses, coping stone and similar locations.

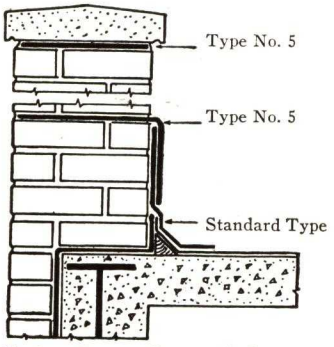
Unique Construction of Wasco Flashing—In Wasco Flashing, a full sheet of electro-sheet copper is bonded to and between two layers of coarsely woven cotton fabric saturated with mastic. The entire assemblage is then grooved the full width of the sheet. Thus, Wasco combines the durability of copper and the flexibility and bonding quality of fabric. To meet various conditions, the copper core is available in four thicknesses: 2, 3, 5 and 7 oz. per sq. ft.

Inportant Advantages—Wasco Flashing, due to its copper core, insures a permanent water barrier. Its rough fabric texture causes a *bonding* adhesion with the mortar. Formed by hand at the point of application, Wasco Flashing is easy to install without waste. Its corrugations—for expansion and contraction—permits its use in long lengths. The corrugation, likewise, insures complete drainage of collected water.

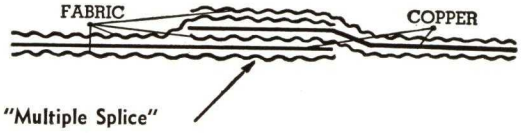
The cost of Wasco Flashing is less than that of other materials serving the same purpose. Specifications on request.

WASCO COPPER-FABRIC MEMBRANE WATERPROOFING

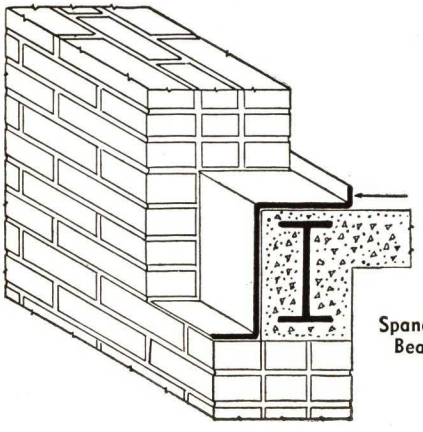
Wasco Waterproofing protects sub-grade construction with a tough, elastic membrane that insures complete protection against leakage. Like Wasco Flashing, this waterproofing combines the durability of copper (2-oz. copper core) with the flexibility and *bonding* quality of asphalt saturated fabric. It is embedded in a waterproofing pitch or pitch mastic. All joints are made absolutely watertight by the *multiple splice* possible only with Wasco.

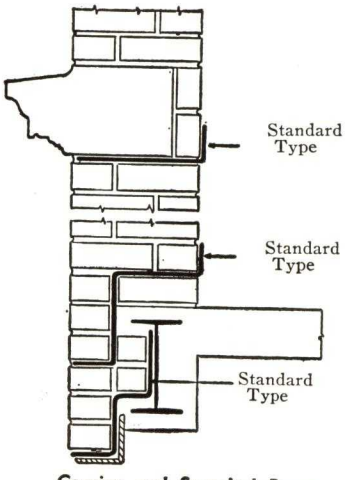


Coping Stone, Cap and Base Flashing, Spandrel Beam

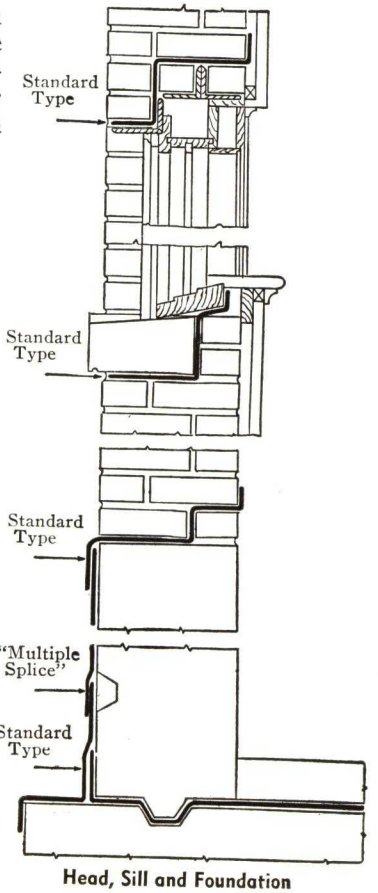


"Multiple Splice"





Cornice and Spandrel Beam



Head, Sill and Foundation

ESTABLISHED 1860

HETZEL ROOFING PRODUCTS CO.

Manufacturers of Roofing Cements and Paints

67 Maine Street, NEWARK, N. J.

CABLE ADDRESS
"Hetzel, Newark"

Products

HETZEL'S ELASTIC ROOF CEMENT (oil base) for all roofs, glass skylights, coping stones, etc.
HETZEL'S ACOUSTICAL CEMENT, "ACOUSTIGLU."
HETZEL'S PLASTIC ROOF COMPOUND and FIBROUS KOTING, (ASPHALT BASE).
HETZEL'S ELASTIC GLAZING and CALKING COMPOUND.
HETZEL'S PIPE JOINT COMPOUND.
HETZEL'S DAMP RESISTING PAINT.
Also Hetzel's Asphalt Paints; Hetzel's "Rub-on" Roofing Paint; Hetzel's Enamel Paint for boiler fronts and steam pipes; Hetzel's Acidproof Paint for metal work, ammonia tanks and gas tanks; Hetzel's Structural Paint for exposed surfaces.

TRADE-MARK

Hetzel's Elastic Roof Cement

Hetzel's elastic roof cement, in use throughout the United States and Europe for many years, is especially valuable for covering and repairing all holes, cracked joints, breaks, or leaks in roofs of all kinds. Used also for pointing around chimneys, skylights, and dormer windows; for repairing coping stones, gutters, wood and stone work which require to be made water-tight; for laying and bedding slate and tile roofs.

Asphalt shingles laid in Hetzel's cement will not curl, nor can snow or rain blow under them.

Colors—Brown, gray, black, white, green and red. It is also made to order to suit every purpose, and is the original slaters', tinners' and tile roofers' cement.

Advantages—Hetzel's elastic roof cement is equally well adapted for use on slate, tin, asbestos, glass, wood and metal roofs; is permanent; does not run or loosen from joints or cracks, is not affected by any extreme of temperature or climatic changes. It does not harden, but preserves complete elasticity even when exposed to extreme heat, cold, dryness or humidity.

Specifications—All nailholes and joints between the slates shall be sealed with Hetzel's Elastic Roof Cement as manufactured by the HETZEL ROOFING PRODUCTS CO., Newark, N. J., in such quantities as to hold the slates in position should they break, or the nails rust away. *(Fig. 1.)*

The joints of all tiles shall be sealed with Hetzel's Elastic Roof Cement as manufactured by the HETZEL ROOFING PRODUCTS CO., Newark, N. J. To prevent leaking, the hip and ridge rolls shall be sealed in a like manner. *(Fig. 2.)*

All cap flashings shall be carefully pointed up with Hetzel's Elastic Roof Cement as manufactured by the HETZEL ROOFING PRODUCTS CO., Newark, N. J. *(Fig. 3.)*

The joints of all copings shall be set and sealed with Hetzel's Elastic Roof Cement as manufactured by the HETZEL ROOFING PRODUCTS CO., Newark, N. J. *(Fig. 4.)*

Hetzel's Acoustical and Insulation Cement, "Acoustiglu"

For applying acoustical and insulating materials to ceilings, floors, walls, oil and gas tanks, etc. It will stick fast to any surface—plaster, glass, gypsum, brick, concrete, stone, metal or wood.

"Acoustiglu" cement is compounded from ingredients which render it proof against alkali, gas, benzine, oil, naphtha and acid fumes and, once it sets, the insulation cannot become loosened. It retains its elasticity indefinitely and is not affected by climatic conditions. Being impervious to moisture it not only acts as a damp resistant factor, but also protects the underside of the material.

Packed in 5, 10, 25-lb. and 5-gal. pails. Color ordinarily is red but other colors may be supplied at additional cost.

Method of Application—To obtain the best result the surface should be clean, dry and free from grease or oil.

For Acoustic Tile—Apply a daub of "Acoustiglu" about 3 in. in diameter and in thickness tapering to about ½ in. near each corner of the tile; then press the tile on the surface in approximate position; then slide away about 1 in. and then slide back into permanent position, pushing tile in place with firm pressure. "Acoustiglu" should be approximately ¼ in. when finally set. Unevenness can be built up with "Acoustiglu." 40 lbs. will take care of approximately 100 sq. ft. of 12x12-in. tile.

For Insulation Board—Apply a strip of "Acoustiglu" about ½ in. thick by 1½ in. wide along edges and across the sheet every 12 in.; then press tile on surface in approximate position; then slide away about 1 in. and slide back into permanent position, using firm pressure and hammer with mallet. 60 to 70 lbs. will take care of about 100 sq. ft. based on strips, about 12 in. apart.

For Dampproofing—Where acting as a damp resistant factor, apply "Acoustiglu" on entire surface of insulation about ¼ in. thick; then put sheet in place in same manner as explained for Insulation Board. 100 to 125 lbs. will take care of about 100 sq. ft.

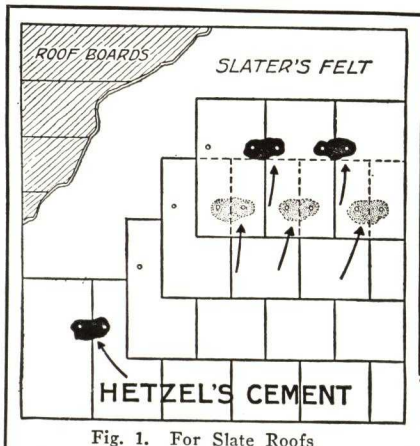


Fig. 1. For Slate Roofs

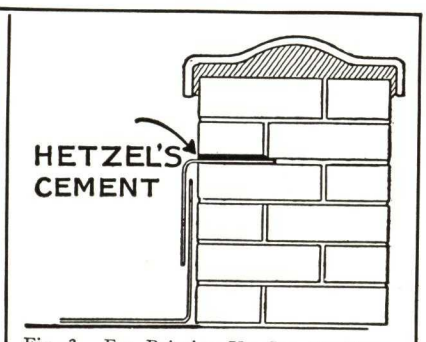


Fig. 3. For Pointing Up Cap Flashings

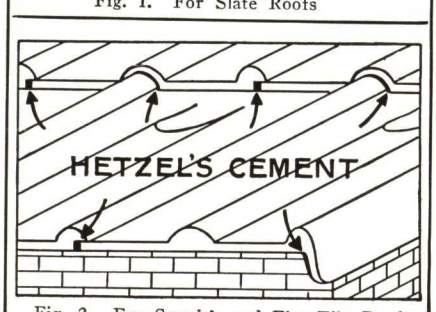


Fig. 2. For Spanish and Flat Tile Roofs

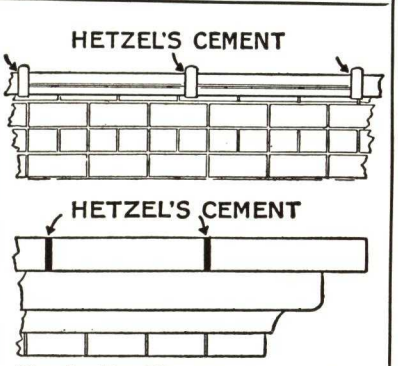


Fig. 4. For Tile and Stone Copings

APPLICATIONS OF HETZEL'S ELASTIC ROOF CEMENT

Hetzel's Plastic Roof Compound and Fibrous Koting (Liquid)

A specially prepared roofing cement made on an asphalt and asbestos base for repairing and painting old wood, tin, iron or felt roofing; for repairing leaky chimneys; for waterproofing below and above grade, etc. The compound is in paste form and the Koting in liquid form. Colors: red, black and green.

Hetzel's Elastic Glazing and Calking Compound

For pointing window frames, hothouses, steel sashes, crevices, cracks in masonry, etc. Remains elastic indefinitely. Will not crack or dry up. Far superior to lead or oakum. Does not contain asphalt or coal tar. Can be painted over with any color. Also made in special consistency for use in guns.

Colors: white, gray, green, black, red and buff.

Pipe Joint Compound (Red, Gray and White)

For joints of gas, steam, water, and air pipes. Will not harden, and prevents joints from rusting. Makes absolutely tight joints which can be disconnected at any time without injury to fittings.

Hetzel's Damp Resisting Paint

A compound black paint for dampproofing foundations and walls above and below grade. When applied to inner side of exterior walls, forms a good dampproof surface for direct application of plaster, rendering plaster stain-proof, and saving cost of furring and lathing.

MEMORANDA

SAMUEL CABOT, INC.

Stained Shingles

141 Milk Street, BOSTON, MASS.

BRANCH OFFICES

NEW YORK, N. Y., 101 Park Avenue
PHILADELPHIA, PA., Real Estate Trust Building
CHICAGO, ILL., 5000 Bloomingdale Avenue
MINNEAPOLIS, MINN., 827 So. Second Avenue

AGENTS AND DISTRIBUTORS IN PRINCIPAL CITIES

For Cabot's Insulating "Quilt," Stains, Collopakes (for every paint use), Waterproofing, Wood Preservatives, see File Index

CABOT'S CREOSOTE STAINED SHINGLES

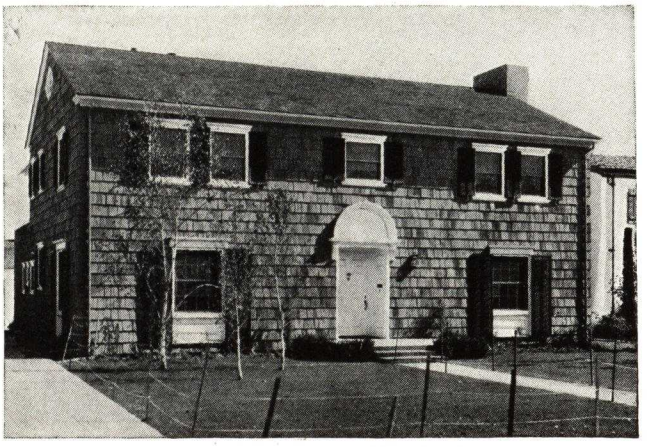
We supply the highest grade red cedar shingles from the Pacific Coast, edge grain and free from defects. These are dipped in the original bundles, whirled in a centrifugal machine to make sure that each shingle is thoroughly impregnated with the Stain, and finally each shingle is individually brushed. (In certain colors of Creosote Stain, brushing is not necessary.) As a result, our Stained Shingles show no unevenness of staining, except that caused by the variation of the wood.

The stains used are Cabot's Creosote Stains, known the country over for their beautiful artistic effects and preservative value. They do not hide the texture of the wood with a heavy, "painty" coating, but instead they display the beauty of the grain at its best advantage. Their high content (over 60%) of refined creosote oil greatly increases the life of the shingles. Shingles stained with our Creosote Stains will last twice as long as unstained shingles.

Cabot's Stained Shingles
Samuel Cabot Inc.

Cabot's Weathering Gray Stains

Cabot's Weathering Gray Creosote Stains produce the old-fashioned, silver gray effect characteristic of old houses on the sea shore. It takes years for nature to obtain these results, but our Weathering Gray Stains do it in six months. If you want weather-beaten, silvery, Cape Cod grays, we suggest that you have the shingles stained with one of Cabot's Weathering Grays.



Residence in Beverly Hills, Calif.
ROLLIN PIERSON, Architect
Walls, Cabot's Creosote Stained Hand Rived Cedar Shakes, roof stained with Cabot's Creosote Shingle and Wood Stains

CABOT'S HEAVY-BODIED STAINED SHINGLES

These are stained with our Heavy-Bodied Shingle Stains which differ from the Creosote Stains in that they produce more solid color effects. These stains go flat as soon as they dry, thus eliminating any shiny or "painty" appearance.

WHITE SHINGLES

We furnish shingles stained with our No. 1166 White Primer. This is not intended for a finish coat, but rather as a priming coat for shingles, to be painted over with our Old Virginia White or DOUBLE-WHITE.

For the true stain effect, we recommend Old Virginia White. This material is midway between a stain and a paint in hiding power. It reveals the texture of the shingles and produces a beautiful, lasting flat white finish. This is the nearest possible approach to a white shingle stain.

DOUBLE-WHITE should be used wherever an opaque white is required. It is our standard outside white paint, and is a very superior product. It has tremendous hiding power (two coats hide as well as three of lead and oil), and it never turns gray or yellow; it always stays *white*. It has a brilliant, soft, semi-flat finish, and for this reason is especially suitable for shingles.

Please see our pages on Stains and Collopakes for a complete description of these two Whites.

COVERING CAPACITY PER SQUARE OF CABOT'S STAINED SHINGLES BASED ON THE FOLLOWING WEATHER EXPOSURE

		4-in. exp.	4½-in. exp.	5-in. exp.	5½-in. exp.	6-in. exp.	6½-in. exp.	7-in. exp.	7½-in. exp.	8-in. exp.	8½-in. exp.	9-in. exp.	9½-in. exp.	10-in. exp.	11-in. exp.	12-in. exp.
XXXXX	1 square of 16 in. (4 bun. 20/20 pack.)	80	90	100	110	120	130	140	150	.....	.....	.....	.....	.....	.....	.....
"Perfections"	1 square of 18 in. (4 bun. 18/18 pack.)	.....	.....	.....	100	109	120	129	138	148	157	.....	.....	.....	.....	.....
"Royals"	1 square of 24 in. (3 bun. 14/14 pack.)	.....	.....	.....	.....	.....	.....	.....	75	80	85	90	95	100	110	120

Please write us for Color Cards and Samples

CREO-DIPT COMPANY, INC.

GENERAL OFFICES AND EASTERN PLANT
NORTH TONAWANDA, N. Y.
WESTERN PLANT, SEATTLE, WASH.

Originators and sole manufacturers of genuine Creo-Dipt Stained Shingles for roofs and sidewalls and special and unusual roof treatment.

CREO-DIPT STAINED SHINGLES
CREO-DIPT HAND SPLIT AND MACHINE GROOVED SHAKES
CREO-DIPT WHITE (DOUBLE STRENGTH)
CREO-DIPT WEATHERPROOFED BUILDING PAPER
CREO-DIPT RUST PROOF ZINC COATED NAILS

CREO-DIPT STAINED SHINGLES—A NATIONALLY RECOGNIZED PRODUCT

Over twenty-five years ago the CREO-DIPT COMPANY, INC. introduced to the building market the first ready-stained shingles ever made. They were met with an immediate and enthusiastic acceptance by building experts because of their obvious quality and convenience. Through the ensuing quarter century the Company has steadily maintained its initial reputation as manufacturers of finest roof and sidewall coverings and employs every opportunity to improve its various products.

Quality Materials

Creo-Dipt Stained Shingles are made of 100% *all clear—all heartwood—all edgegrain—red cedar.*

They are stained by the Creo-Dipt patented dipping process in a heavy bodied specially prepared shingle stain. In addition to this operation, each shingle is individually brushed on both sides for equal and even distribution of the color.

Colors Available

Creo-Dipt Stained Shingles are available in all shades of green, brown, red, gray, blue, black and 207 White Primer. (Send for our assortment of colors and shades on real cedar.) Special color samples matched or furnished on request.

Variegated Colors

Creo-Dipt Stained Shingles are also available in any number of colors mixed in the bundles or cartons to be laid by the workmen as received. Variegated colors are the same price as shades of gray.

Blended Shades

Creo-Dipt Stained Shingles are also available in blending shades of brown, red, green, and gray, blending these darkest at eaves to lightest at ridge. (We will furnish a laying schedule for blending on request.)

CREO-DIPT SHAKES—FOR ROOFS AND SIDEWALLS
Hand Split and Machine Grooved Shingles

Attractive and unusual effects may be obtained by using Creo-Dipt hand split or machine grooved Shakes. They are available in 18, 25, 31 and 37 in. lengths in random width and thickness. Furnished stained in any popular Creo-Dipt color, or may be used in their natural unstained finish.

Creo-Dipt "Pilgrim" Hand Split Shingles

Hand split from first growth live red cedar. Their rustic, rugged appearance is reminiscent of Colonial days. Supplied in random widths, butts vary from ⅝ to 1¼ in. thickness—sufficiently heavy to produce an artistic shadow line.

Creo-Dipt "Yorktown" Shakes

Hand split and similar to Pilgrims but with more regularity of thickness. Their natural rough hewn beauty makes them extremely valuable for both roofs and sidewalls. Thicknesses —½ to ⅝ in.

Creo-Dipt "Ambassadors" Machine Grooved Shakes

Ambassadors are available in 18 and 24-in. lengths and are machine grooved on one side. Butts are square and edges lay parallel. They give the appearance of a well weathered shingle as the ribbing shows prominently.

An Example of Creo-Dipt Beauty

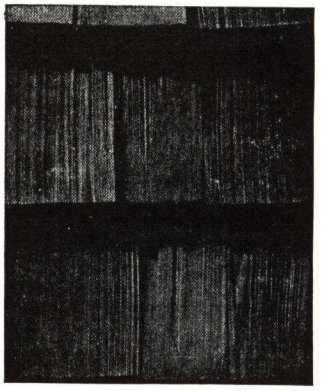
The beautiful detail view (shown) of a Creo-Dipt home in Scarsdale, N. Y., was designed by Electus D. Litchfield, architect of New York City.

Special Creo-Dipt 25-in. Hand Split Shakes, stained a light silvery gray, for sidewalls. Roof shingles are a deep weathered brown.

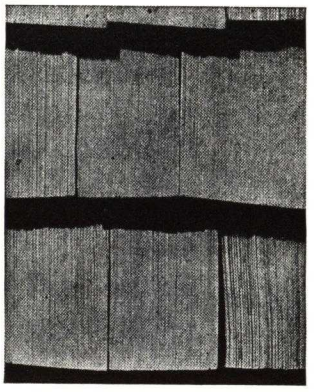
SPECIFICATIONS AND APPLICATION DATA FOR CREO-DIPT SHAKES

Roofs—Apply over closed sheathing and with a strip of Creo-Dipt Weatherproofed Building Paper, heavy weight, 18 in. wide laid in between each course. Starting at the eaves with a double course of shingles, lay a strip of Creo-Dipt Weatherproofed Building Paper 15 in. from butts and cover paper with next course of shingles laid 7½ in. from butts of starter course, breaking all joints in at least the next two with a 2-in. side lap. Proceed in like manner for each course.

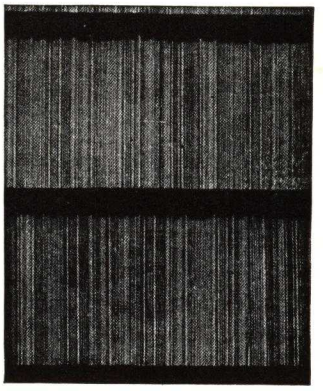
Hips and Ridges—*Boston style*—Shingles laid horizontally over a double thickness of Creo-Dipt Weatherproofed Paper, Heavy weight. *Mitered hips* shall be laid tight and mitered, flashed under each course with a copper shingle 8 in. wide and long enough to give a 2-in. head lap, taking care that no nails go through flashing, except at extreme outward corners. *Mitered ridges* shall be laid tight and mitered. Under last course of shingles, at ridge, lay a continuous strip of copper to extend down on both sides 4 in. Nail last course close to butts, and toenail at top, no nails to go through flashing at any point.



Creo-Dipt Pilgrim Hand Split



Creo-Dipt Yorktown Hand Split



Creo-Dipt Ambassador Machine Grooved

Valleys—*Open style:* Cut shingles parallel to valley, forming gutter not to exceed 6-in. width. Valleys to be made from 16-oz. copper sheet 20 in. with 3-in. splash rib down center and crimp of ½ in. on outer edges. *Rounded valleys* shall be laid closed and rounded over small saddles built in by carpenter. Between each course of shingles, use a strip of copper sufficiently wide to extend at least 8 in. up on either side of valley and long enough to make at least a 2-in. head lap, nailing all valley shingles so that nails will come under lap of flashing.

Sidewalls—Lay over solid sheathing and one layer of Creo-Dipt Weatherproofed Building Paper—standard, medium or heavy weight. Starting course shall be double. Break all joints with at least a 2-in. side lap.

Nails—Creo-Dipt Rustproof Zinc Coated Nails. Roofs: 8d nails. Sidewalls: 5d nails. Two nails in each shingle.

Write Creo-Dipt Company, Inc., North Tonawanda, N. Y. for complete illustrated specification folder.

CREO-DIPT WEATHERPROOFED BUILDING PAPER

This paper has a 100% pure kraft paper base.

Special compounds are infused into the kraft fibres. It is not a coated or saturated paper; the patented process of infusion permanently seals and protects the fibres indefinitely, strengthens them and produces a long-lived, tough, flexible, non-absorbing, waterproof sheet.

It is remarkably free from the effects of temperature changes because it is infused at 350° F. It does not dry out nor crack nor break when creased, rolled or bent, even in the coldest temperatures. It will not get tacky or sticky, will not "run" or "bleed" in extremely warm weather. It is strong, light in weight and easily handled. It is the most ideal and the safest weatherproofed building paper for use underneath Creo-Dipt Stained Shingles, sidewalls and roofs.

It is waterproof, moistureproof and practically airtight; excellent added insulation against heat and cold; proof against vermin and insects; cannot mildew and will not support spore-growth of any kind. It is absolutely odorless.

Furnished in rolls 36 in. wide containing 500 sq. ft., guaranteed measurement. It is also available on special orders in wider rolls. There are three weights—Standard, Medium and Heavy.

CREO-DIPT ZINC COATED NAILS

Creo-Dipt Nails are the only correct nails with which to apply Creo-Dipt Stained Shingles. Their use doubles the life of a roof or sidewall. The blunt point prevents splitting the shingles.

Creo-Dipt Zinc Coated Nails are hot-dipped in pure, molten zinc and remain rustproof indefinitely. The coating on cheap nails, such as "galvanized" or "plated," is so thin that it cannot long resist rust. When rusted, nail heads break off and the wood rots around them, enlarging the nailholes. When this occurs, shingles are easily blown off.

A Creo-Dipt Roof, when applied with these nails, is good for thirty or forty years of service, while a sidewall will outlast the house itself.

CREO-DIPT DOUBLE STRENGTH WHITE

Creo-Dipt White is recommended as giving the best results where white is to be used on wood shingles. It is a special pure white brush coat preparation that gives the true New England Colonial flat white effect. Made expressly to be used on wood shingles, Creo-Dipt White has the soft, velvety appearance of whitewash combined with extraordinary wear-resisting qualities. It avoids a "painty" appearance and may also be used on rough surfaced lumber, brick, stone or stucco.

Reasons for Superiority

The superiority of Creo-Dipt White for wood shingles lies in its hiding qualities, ease of application, greater covering capacity, intense pure whiteness and resistance to weather.

Creo-Dipt White flows readily off the brush. It does not stick or drag, making it easy to do a neat, workmanlike job without lap or brush marks. Creo-Dipt White on wood shingles covers approximately 350 sq. ft. per gal., one brush coat, over No. 207 White Primer. For the best results our No. 207 White Primer should always be applied on the wood shingles before using Creo-Dipt White.

Creo-Dipt White on wood shingles weathers by gradual chalking and produces an ideal surface for refinishing years later and will not peel nor alligator. Creo-Dipt White resists ocean front climate and salt spray, which ruin ordinary whites rapidly and completely. High pigment concentration gives complete protection from the ravages of salt spray, wind, snow, rain or sleet and the ultra-violet rays of the sun so destructive to ordinary whites. It is the proper white to use on wood shingles.

Two-Coat Application Method

This economical *two-coat* system for wood shingles is one coat of Creo-Dipt No. 207 White Primer and one coat of Creo-Dipt White (Double Strength). It is an inexpensive flat white finish for wood shingles.

On wood shingles that are extremely weathered and worn, use for the first coat, instead of No. 207 Primer, a prime coat of 1 qt. of boiled linseed oil added to a gallon of Creo-Dipt White. When this has dried thoroughly, apply a second coat of Creo-Dipt White just as it comes from the can.

Creo-Dipt Stained Shingles for a white house are treated at the factories by a special process with Creo-Dipt No. 207 White Primer, and are ready for Creo-Dipt White after the shingles are put on the house.

CREO-DIPT STAINS

In addition to Creo-Dipt White, we manufacture Creo-Dipt Stains for restoring the color and preserving old wood shingles. Creo-Dipt Stains come in the same wide variety of colors as Creo-Dipt Stained Shingles. Write to Creo-Dipt Company, Inc., North Tonawanda, N. Y., for complete information.

Note: Ask about the new Creo-Dipt Double Wall Treatment with zephyrs laid at wide 14-in. exposure.

COLONIAL LUMBER SPECIALTIES, INC.

Manufacturing and Merchandising Direct to Consumer
Early American Brand Hand Split Red Cedar Shingles

TELEPHONE
COrtlandt 7-5705

HOME OFFICE
30 Church Street, NEW YORK, N. Y.

Early American Brand

(Reg. U. S. Pat. Off.)

HAND SPLIT RED CEDAR SHINGLE

DESCRIPTION

EARLY AMERICAN BRAND HAND SPLIT SHINGLES are rough textured, hand hewn from Western Red Cedar. Random widths from 5" to 12". All have a natural tapering tip with smooth flat back, insuring a tight fitting roof or sidewall.

SCOPE

For roofs or sidewalls wherein it is desired to accomplish both unusual beauty and maximum durability at low cost.

TYPES AND PRICES

Daniel Boones
3/8" to 5/8" butts x 25" long.
$2.25 per bundle, destination.*

Juniors
1/2" to 3/4" butts x 25" long.
$2.50 per bundle, destination.*

Seniors
3/4" to 1" butts x 25" long.
$2.75 per bundle, destination.*

Jumbos
7/8" to 1 1/4" butts x 25" long.
$3.00 per bundle, destination.*

*Michigan, Indiana and States East

ALTERNATE SIZES AND COLORS

All types available on special mill order in specified width or lengths or stained to match any desired color.

Write for our Color Selector showing *actual shades* on *split cedar.*

COVERAGE TABLES (Based on 8/8 Pack)

	Exposure to weather in inches	Bundles required per 100 sq. ft.
Roof	6	8
	7	7
	8	6
Sidewall	9	5.4
	10	5
	11	4.5
	12	4

GENERAL PROVISIONS

All starter courses to be doubled, using for the under course a sawn No. 1 Perfection shingle. The use of 16-oz. copper lead coated, is endorsed wherever flashings or valleys are indicated. Use hot dipped zinc coated shingle nails of adequate length with due regard to the thickness of shingle involved.

These shingles may be laid upon the conventional 1" x 3" or 1" x 2" shingle strips or may be laid upon matched sheathing covered with a good grade of waterproof building paper. Many architects prefer the latter type of roof due to its superior insulation value and complete absence of infiltration.

SPECIFICATIONS

Scope—All [roofs], [sidewalls], shall be covered with "Early American Brand" (specify type), as furnished by COLONIAL LUMBER SPECIALTIES, INC., 30 Church Street, New York, N. Y. Expose shingles (specify exposure in inches) to the weather. Shingles shall be laid in parallel courses, doubled at eaves. Break all joints of Hand Split Shingles with at least a 2" sidelap. Lay Hand Split Shingles not less than 1/8" apart. Each 4" in width should contain a nail. No shingle to contain less than two nails. See our brochure for additional specifications.

FEATURES

Our hand split shingles have a normally rough face texture and require no paint or stain to preserve or color them.

They rapidly weather to a lustrous and permanent gray with a soft silver sheen.

Made from rot-resisting cedar in the approved edge grain fashion, their long life and low cost of upkeep make a roof or sidewall of extraordinary durability.

The high insulation value of cedar shingles is well known.

We will be pleased to send you a list of our installations in your area upon request.

Write for illustrated brochure and sample copy of our guarantee against damage by the elements.

Our layout staff will be pleased to assist with your more difficult problems, such as graduated-exposure roofs, etc. When requested our field representative will place himself at your disposal.

ROBERT C. KILBORN, Architect

Van Anda, Photo

Specify Early American Brand Hand Split Red Cedar Shingles for Heavily Shaded Reveals, Textured Highlights and Individuality

Our Daniel Boone Type Shingle Costs $9.00 Per Square Delivered. Sidewalls at 12" Exp. T.W.

POST AND RAIL FENCE

We supply either Locust or Chestnut posts, both in three or four-hole types. Length 7′.

Hand hewn split Chestnut rails, 11′ long, pointed at both ends, thus making a 10′ panel.

All fresh cut West Virginia stock nicely manufactured.

20T

HURDLE FENCE

Hand made; rails and braces of Chestnut; posts of Chestnut or Locust, as desired. One Locust pin accompanies each panel. Panels can be either four or five-bar type. Length 8′ 3″. Shipped completely assembled or knocked down, with posts bored and parts fitted ready to put together.

JOHN C. RUNKLE, President

THE ELHIDE COMPANY

Makers of Elhide Hand-Split Cedar Shingles

130 Sixth Street, CAMBRIDGE, MASS.

TELEPHONE: Kirkland 5100

PLANTS: HATZIC, B. C.; CAMBRIDGE, MASS.

Products

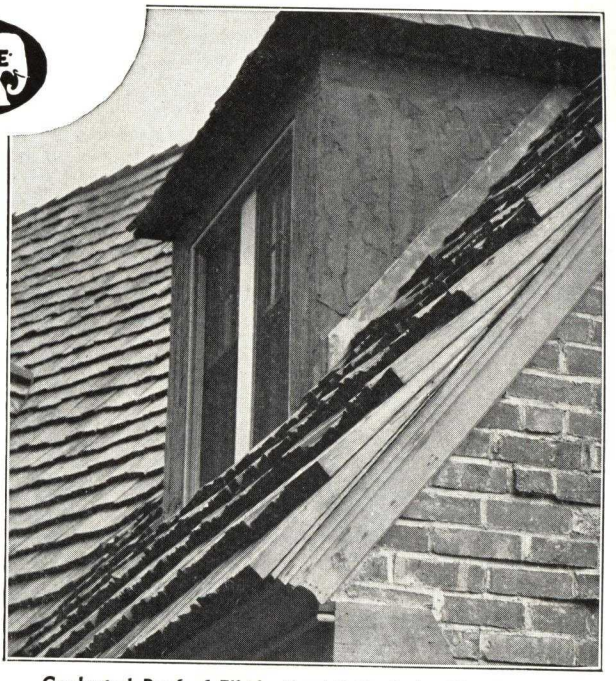
ELHIDE HAND-SPLIT CEDAR SHINGLES.
Also Elhide Monson Maine Roofing Slate.
For Elhide Woven Rustic Fencing—see File Index.

Elhide Hand-Split Cedar Shingles

These shingles are rived by hand from the giant red cedars of British Columbia, a wood famous for its non-rotting qualities. After the shakes are split by hand, each one is sawn diagonally, under our patent, into two tapered shingles, which leaves the upper or exposed surface of each shingle in its natural beauty, a rugged hand-split textured shingle, while the under-side is sawn smooth to make a level laying surface.

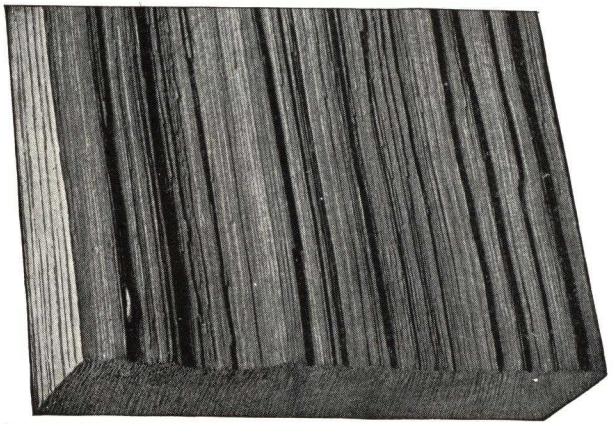
Elhide Shingles are 100% edge-grain and air dried, or equivalent. The former prevents warping, curling and splitting, while the latter retains the natural oils in the wood so essential to the long life of the shingle, and so often dissipated by excessive artificial drying.

These shingles need no staining to preserve them, and when laid unstained, weather to soft and very pleasing tones. If staining is desired, we are prepared to furnish them in white or any color. Elhide Hand-Split Cedar Shingles are made in random widths, 5 to 12 in., and in the following lengths and butt thicknesses: ½-in. butts, 26 in. long—¾ in., 1 in. and mixed butts ⅝ to 1¼ in.—26 and 32 in. long. 1¼, 1½, 1¾ and 2-in. butts, 32 in. long. Also made to order in any butt thickness and length desired. ¾-in. butts and heavier give the most satisfactory results.



Graduated Roof of Elhide Hand-Split Cedar Shingles on a Residence, Wellesley, Mass.
WALKER, WALKER & KINGSBURY, Architects, Boston, Mass.

Cottage in Darien, Conn.
DAVIS & WALLDORFF, Architects, New Haven, Conn.



Note the Beautiful Texture of This Surface Which Varies in Each Individual Shingle

Elhide Graduated Roofs

Heretofore, when laying out a graduated roof, the only available material has been slate slabs. THE ELHIDE COMPANY has now produced for this purpose massive hand-split cedar shingles up to 2 in. in thickness. With these shingles, the architect can design a graduated roof of unsurpassed massiveness and strength, and yet retain all the beauty and characteristic charm of the wooden shingle enhanced by the ruggedness and texture of the hand-split surface.

For example, a roof may be laid with 2-in. butt shingles at a 12-in. exposure at the eaves, gradually reducing both the thickness of the butts and the exposure to the weather to ½-in. butts and a 6-in. exposure at the ridge.

Upon presentation of roof plans and elevations, we shall be pleased to furnish, without charge, definite layouts for graduated roofs.

Elhide Hand-Split Cedar Shingles retain all the well-known desirable qualities that are inherent in the wooden shingle, and in addition provide a beautiful rugged textured surface. These shingles give a durability, and freedom from upkeep expense obtainable only in a shingle rived by hand, entirely edge-grain and free from excessive artificial drying.

Full information, specifications and pictures of installations furnished upon request.

A Few Installations

OWNER	ARCHITECT
George Roberts, East Hampton, N. Y.	Aymar Embury II
N. E. States Exhibition, Springfield, Mass.	Joseph Everett Chandler
P. A. Clark, Kingston, N. Y.	Edgar Salomonsky
John Hay Whitney, Manhasset, N. Y.	LaFarge, Warren & Clark
Mrs. William White, Haverford, Pa.	Willing, Sims & Talbutt
Dr. Philip G. Cole, Tarrytown, N. Y.	LaFarge, Clark & Creighton
H. P. Metcalf, Exeter, R. I.	W. T. Aldrich
Samuel Halsey, Sunapee Depot, N. H.	Prentice Sanger
Mrs. Prescott Slade, Mill Neck, N. Y.	Chester A. Patterson
Morris Brill, Mt. Kisco, N. Y.	Taylor & Levi
Mrs. J. P. Kellogg, Rumson, N. J.	Polhemus & Coffin
E. P. Swenson, Upper Saranac, N. Y.	Godwin, Thompson & Patterson
J. Wilton Peters, New Canaan, Conn.	Henry Otis Chapman

JAMES LUMBER COMPANY

ESTABLISHED 1875

Makers of "Blue Jay" Hand Split Cypress Shingles

88 Broad Street, BOSTON, MASS.

THE ARCHITECTURAL APPEAL OF "BLUE JAY" SHINGLES

Much of the attractiveness possessed by many buildings of Colonial times was due to the use of hand split shingles on both sidewalls and roofs.

To architects who are desirous of reproducing the same qualities of texture and long life in their buildings, attention is called to "Blue Jay" Hand Split Heartwood Cypress Shingles.

No single generation lives long enough to renew a roof covered with genuine hand split and shaved cypress shingles.

HOW "BLUE JAY" SHINGLES DIFFER FROM SAWED SHINGLES

"Blue Jay" Shingles differ from the commercial sawed shingles in three different ways: Thickness and method of tapering, surface texture, and method of producing.

Thickness and Method of Tapering—"Blue Jay" Shingles are practically the same thickness half their length before they are tapered by shaving with a draw knife, whereas the sawed shingles have a uniform taper from butt to tip. The extra thickness prevents curl and provides extra depth for wear.

Surface Texture—The method of hand splitting with the grain gives an individual texture to each shingle and no two are alike. This gives interest and texture to the wall or roof which is impossible to produce otherwise. The flat grain preserves all the wonderful weather-resisting qualities of heartwood cypress.

Method of Producing—The same hand methods which the pioneers in South Carolina followed in making shingles as far back as 1640 are followed in producing "Blue Jay" Shingles. Today descendants of the slaves who produced the early shingles are working in the same southern swamps, felling selected trees, cutting bolts and with frow, maul and draw-shave are making "Blue-Jay" Shingles.

Splitting and Tapering—After splitting to the proper butt thickness, the upper half of the shingle is tapered to ⅛ in. thick producing a shingle very different from the sawed shingle.

Weathering and Coloring—They are then piled loosely and left to season and to weather in the sun and air. "Blue Jays" when delivered are already semi-weathered. They weather to a silver gray. They never require staining for appearance or preservative purposes, but may be whitened or colored with any paint or standard shingle stain.

Sizes—All "Blue Jay" Shingles are carefully selected, graded and fully guaranteed. They are made in the two sizes most favored in Colonial days:

24 in., with ⅝ in. butts and ⅛ in. tops.
20 in., with ½ in. butts and ⅛ in. tops.

Samples gladly supplied on request.

Laying—For roofing, the 24-in. size should be laid 7 in. to the weather, and the 20-in. size 6 in. to the weather. For sidewalls, the 24-in. shingles may be placed 9 or even 10 in. to the weather. The 20-in. size should be laid 7 or 8 in. to the weather.

Nailing—Specify copper (1¾ to 2¼ in. in length), "yellow metal" or old-fashioned dipped galvanized nails, 5d or 6d according to exposure. The less the amount of shingle exposed to the weather the longer the nail should be. On sidewalls, 4d nails may be used. Prices on nails will be quoted if desired.

Staining—"Blue Jay" Shingles never have that "new," "raw" look and never actually require staining for appearance or preservative purposes, but they may be whitened or colored with paint or any standard stain.

Prices—Gladly supplied on request. You will be surprised and pleased to learn how modest they are. Please give us the following data:

The size—that is, 20 in. and/or 24 in.

The area in square feet to be covered.

The place of delivery.

The approximate date of delivery wanted.

Shipments—Made from Boston stock or from our camps direct, as best suited to the particular order. Ample supplies always on hand.

Specifying—*To obtain the genuine article, specify as follows: "For roof and sidewalls use genuine cypress, clear all heart, hand made, split and shaved shingles, 'Blue Jay Brand,' supplied by* JAMES LUMBER COMPANY, *88 Broad Street, Boston, Mass."*

Sawed Cypress Shingles—We sell them also.

Built about 1740 — **"Reed House" Kingston, Mass.** **24-in. "Blue Jays" at 10-in. exposure** — *Reconditioned 1929*

RED CEDAR SHINGLE BUREAU

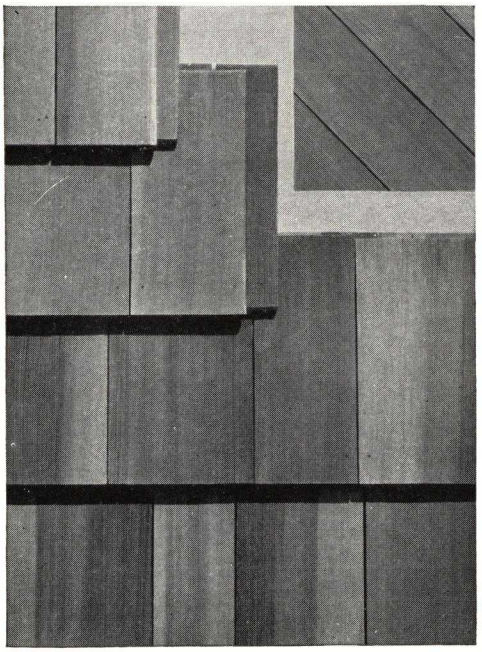
Certigrade Red Cedar Shingles
5508 White Building, SEATTLE, WASH.

CERTIGRADE Red Cedar Shingles are manufactured by members of the RED CEDAR SHINGLE BUREAU, an association composed of practically 90% of the Red Cedar Shingle manufacturers of the United States and Canada, organized for the purpose of bettering the roofs and sidewalls of the country and stimulating the demand for Red Cedar Shingles everywhere.

CERTIGRADE Red Cedar Shingles are made under the Grading Requirements of Commercial Standard C. S. 31-38, as issued by the United States Department of Commerce.

Every bundle of shingles bearing the Certigrade Label is guaranteed to conform to these grades in every respect—your certificate of protection.

Modest home or pretentious mansion, both are good subjects for the application of Certigrade Cedar Shingles. The famous Certigrade Home (shown above) is an example of their use in low cost housing.



Double-coursing of sidewalls insulates against cold and heat. It creates deep shadow lines, builds substantial walls—easily painted or stained. Proper application shown here.

UNRIVALLED ATTRIBUTES OF GENUINE RED CEDAR SHINGLES

Beauty, comfort, economy, durability, insulation and style are factors of equal importance to the home builder, architect and contractor alike. CERTIGRADE Red Cedar Shingles on roof and sidewall lend themselves harmoniously to any type or style of architecture, to small cottage as well as pretentious mansion. Their pleasing variety of width, together with the subdued play of tone and color in the super-durable, vertical grain heartwood, awaken responsive notes in all who really appreciate the true beauty of a well-built home.

DOUBLE-COURSING

Two layers of genuine Cedar Shingles on sidewalls are beautiful and substantial. Deep shadow lines are created. Wide exposures are possible. Furthermore, the unusual insulation offered by genuine Cedar Shingles makes double-coursing especially effective in planning air-conditioned homes. Fuel bills are reduced. The cost of double-coursing is no more because shingles are laid with a wider exposure to the weather.

OVER-ROOFING

Applying CERTIGRADE Red Cedar Shingles right over the old roof is practical, time-tested, economical and efficient. The expense of removing the old shingles is saved. There is no litter or dirt, no damage to lawn or flowers, and the double roof gives double insulation value. The increase in thickness of the roof greatly strengthens the structure. Work can be done at any time because the protection of the old roof is maintained.

CERTIGRADE LABEL

This is a miniature reproduction of the "CERTIGRADE Label." Insist that it appear on every bundle. It is for your protection and insurance that the shingles inspected by the RED CEDAR SHINGLE BUREAU are guaranteed by the manfacturer to meet all requirements of commercial standards as issued by the United States Department of commerce.

The No. 1 Grade label can only be used on Edge Grain, 100% heartwood, All Clear, Red Cedar Shingles, manufactured by licensed mills.

Labels are supplied to the shingle mills in small allotments which are delivered at specific intervals, depending upon the actual cut of the mill. If the Bureau inspectors find that the shingles manufactured fall below the requirements of the Grading Rules, the supply of labels is withheld until the trouble is corrected.

No. 2 and No. 3 grades are also inspected and appropriately labeled.

ARCHITECT'S MASTER SPECIFICATIONS

SHEATHING BOARDS: ROOFERS

(The choice of open or solid sheathing is optional when CERTIGRADE Shingles are applied. The geographical location of the building will determine the most practical procedure.)

(1) All sheathing shall be

(Use 2 for open sheathing and 3 for solid sheathing.)

(2) square edge boards cut from 1" stock not over 6" wide and shall be spaced the same distance apart on centers as the shingles are to be laid to the weather.

(Use 3 for solid sheathing.)

(3) Dressed and Matched or Shiplap cut from 1" stock not over 8" wide and shall be laid solid.

*(Use 4 for **both** open and solid sheathing.)*

(4) Each board shall be double face nailed at each end and at each bearing with two 10d nails driven about 1" from the edges of the boards.

SHEATHING PAPER

(5) The outside of all exterior sheathed walls shall be covered with one continuous unbroken layer of rosin sized sheathing paper weighing not less than 15 lbs. per roll of 500 square feet.

(If added insulation is wanted, dry or unsaturated deadening felt, or light weight "blue" wall board, may be specified. Pitch or "asphalt" saturated "dry" felt, or building papers with an "asphalt" core are not recommended.)

(6) Sheathing paper shall be laid shingle fashion without wrinkles or buckles and with all joints at least 6" and shall be carried over the studs, jambs, heads and sills of all openings, and no end laps shall occur within 18" of any internal or external corner.

SHINGLES

(7) The Contractor shall cover all roof surfaces *(Specify all other locations, as in 8.)*

(8) and all exterior side walls, sides of dormers, gable ends.

(9) with CERTIGRADE Red Cedar Shingles—bearing the Red Cedar Shingle Bureau's official grade marked label.

(Certigrade Red Cedar Shingles are manufactured in three different lengths: 16", 18" and 24". Three grades in each length—No. 1, No. 2 and No. 3—are available; the No. 1 grade being the best, and the No. 3 grade being intended for purposes where the presence of defects above the standard weather exposure will not militate against their use. No. 2 is an intermediate grade.

No. 1 Shingles in each length are strictly vertical or edge-grain, are made exclusively of decay-resistant heartwood, and are entirely "clear." They should be specified for roofs in all first-class construction.

No. 2 Shingles may be used to advantage on secondary buildings, and for under-coursing in "double-coursed" side walls.

No. 3 Shingles may also be used as under-coursing in side wall construction.

The choice of length of the shingles to be used may be determined upon the basis of the architectural effect that is wanted, and the cost that is justified. The longer shingles have thicker butts and are consequently longer lived, although the 16-in. length in the No. 1 grade will give exceedingly good service, and very long life when properly applied according to these specifications.

Please consult the Certigrade Handbook of Red Cedar Shingles, and the official grading rules of the Red Cedar Shingle Bureau for full details. Copies of each will be furnished promptly upon request.)

(10) Shingles for roofs shall be *(Specify grade and length.)*

(11) Shingles for side walls shall be *(Specify grade and length.)*

(12) Shingles for outer courses shall be *(Specify grade and length.)*

(13) Shingles for under courses shall be *(Specify grade and length.)*

(14) Roof shingles shall be laid with a weather exposure of *(Specify exposure to the weather in inches from the following table.)*

(In general the lowest pitch used in the roof will govern although certain instances may permit two different weather exposures for separate parts of the same roof.)

Pitch of Roof			*Exposure of Shingles in inches*		
Pitch	*Rise (in inches)*	*Run*	*16*	*18*	*24*
1/8	3	12			
1/6	4	12	3¾	4¼	5¾
1/4	6	12			
1/3	8	12			
1/2	12	12	5	5½	7½
5/8	15	12			
3/4	18	12			

(15) Side wall shingles shall be applied with a weather exposure of *(Specify exposure to the weather in inches from the following table.)*

Length of Shingles (in inches)	*Exposure of Shingles (in inches)*	
	Single Course	*Double Course**
16	6 to 7½	8 to 12
18	6 to 8½	8 to 14
24	8 to 11	12 to 16

**Assuming exposed course is face nailed.*

(16) Shingles shall be doubled at all eaves *(Specify "tripled" where box cornices occur.)*

(Use 17 for side walls.)

(17) and at foundation line

(To insure proper spill into gutters use 18.)

(18) Butts of the shingles in the first course on roofs shall project 1½" from the first sheathing board.

(19) Roof shingles shall be spaced apart not less than ¼" nor more than ⅜".

(20) Side wall shingles shall be *(Specify spacing as in 21 or 22.)*

(21) laid with close jointed edges.

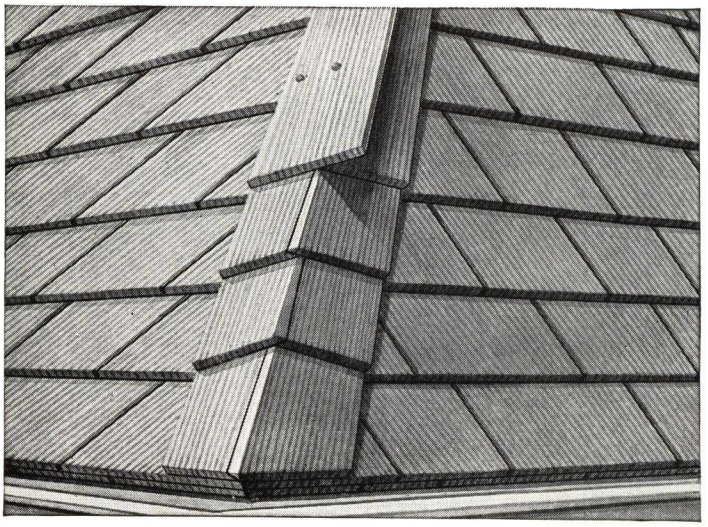
(22) spaced apart not less than ⅛" nor more than ¼".

(23) and the joints in the shingles in any one course shall be not less than 1½" away from the joints in the two courses next below.

HIPS AND RIDGES

(24) All hips and ridges shall be *(Specify type of which 25 is an example.)*

(25) the modified "Boston" type. Shingles shall be of approximately the same uniform width. The first shingle of the hip shall be sawed across the butt so that the edge of the butt will be parallel with the butts of the shingles in the first course of shingles at the eave line. It shall then be nailed in place with the lower edge extending along a line previously marked off back from the center line of the hip on that side, the nails being placed so that they will be covered by the next hip shingle applied. The edge of this shingle projecting above the center line of the hip shall be cut back flush with the face of the opposite hip or ridge shingle. The next two shingles are now applied, but in reverse order, so that the final trimmed-off edge slants in a direction opposite to that of the first exposed edge.



How a modified and recommended "Boston" hip is made

VALLEYS

(For clauses covering sheet metal flashings etc. see 43 to 54.)

(26) All valleys shall be *(Specify whether "open" or "closed" as in 27 and 28.)*

(27) open, with shingles lapping the valley flashing not less than 6" on each side.

(28) closed, with flashings under each course to a width of 9" on each side of the valley.

(29) Shingles extending into the valley shall be sawed to the proper miter.

(30) Breaking of joints in shingle courses into valley will not be permitted.

(31) Laying of shingles, with grain parallel with the center line of the valleys, will not be permitted.

NAILS AND NAILING

(Do not use bright, or blued, steel wire nails in applying CERTIGRADE *shingles.)*

(32) Each shingle shall be rigidly secured in place with not more than two full driven hot dipped heavily zinc coated *(Specify size.)*

(Use 33 with 37 for new roofing with 16" and 18" shingles.)

(33) 3d shingle nails.

(Use 34 for new roofing with 24" shingles.)

(34) 4d shingle nails.

(Use 35 for new side walls with all shingles and for over roofing with 16" and 18" shingles.)

(35) 5d "box" or special 14-gauge shingle nails.

(Use 36 for over-roofing with 24" shingles. For butt nailing in double-coursing use small head 5d nails.)

(36) 6d shingle nails.

(37) except that 5d shingle nails shall be used for hips and ridges.

(38) Nails shall be driven flush but not so that the head crushes the wood and shall be placed not more than ¾" from the side edges of the shingles and from ¾" to 2" above the butt line of the shingles in the next course above.

(Use 39 where double coursing occurs.)

(39) except that in butt nailing in double-coursing, the nails shall be placed from 2" to 3" above the butt line.

FOR NEW ROOF CONSTRUCTION			OVER-ROOFING CONSTRUCTION		DOUBLE-COURSING
3*d*	3*d*	4*d**	5*d**	6*d**	5*d*
FOR 16" AND 18" SHINGLES		FOR 24" SHINGLES	FOR 16" & 18" SHINGLES	FOR 24" SHINGLES	FOR ALL SHINGLES
1¼" LONG	1¼" LONG #14½ GAUGE	1½" LONG #14 GAUGE	1¾" LONG #14 GAUGE	2" LONG #13 GAUGE	1¾" LONG #14 GAUGE
APPROX 376 NAILS TO LB	APPROX 515 NAILS TO LB.	APPROX 382 NAILS TO LB.	APPROX. 310 NAILS TO LB.	APPROX. 220 NAILS TO LB.	APPROX. 380 NAILS TO LB.

SQUARE CUT NAILS OF SAME LENGTH WILL ALSO GIVE SATISFACTORY SERVICE

*SO-CALLED "BOX" NAILS OF THE SIZES GIVEN WILL PROVE SATISFACTORY IF PROPERLY ZINC COATED BY THE HOT-DIPPING PROCESS.

FLASHINGS

(40) All flashings and sheet metal throughout shall be *(Specify material weights, etc.)*

(The proper choice of materials for valleys and flashings rests with the architect, and must, of course, be determined upon the basis of cost as well as probable life. 16" Certigrade Red Cedar Shingles will give good service for 25 to 50 years or longer, depending upon grade, exposure, and pitch of roof; hence much consideration should be given to the proper choice of metal for flashings.)

Lead: *Lead should be specified as "hard lead" weighing not less than 2½ lb. per sq. ft. for step flashings and not less than 3 lb. per sq. ft. elsewhere.*

Tin: *Tin should be not less than IX coated with tin and lead, containing not less than 25% tin and weighing not less than 40 lbs. per box of 112 sheets 20" x 28" in size.*

Galvanized Iron: *Galvanized Iron should be specified by gauge and coating using 24 or 26 gauge with a coating not less than 1½ ounces per square foot.*

Solder: *Solder should be specified as half and half pig lead and block tin. Flux should be rosin for tin and acid for galvanized iron.*

(41) Proper allowance shall be made in all cases for expansion and contraction and all flat and lap seams shall be made in the direction of the flow of water.

(42) The Contractor shall provide flashing and counterflashing wherever indicated on the drawings and as necessary to make weather and water tight job. Flashing shall be free from longitudinal joints.

VALLEY FLASHINGS

(Use 43 to 53 for Open Valleys and 54 for Closed Valleys.)

(43) Longitudinal joints in valleys will not be permitted.

(44) Transverse joints shall be made shingle fashion and lap not less than
(Use 45 for roofs of ½ pitch or steeper.)

(45) 6 inches
(Use 46 on roofs of ½ to ¼ pitch.)

(46) 8 inches
(Use 47 on roofs of less than ¼ pitch.)

(47) 10 inches
(Use 48 for tin.)

(48) and shall be soldered.
(Use 49 for lead.)

(49) Valley sheets shall not be longer than 8 ft. Joints between lead sheets must be loose-locked, the joint being filled with an approved non-hardening compound. Lead valley sheets shall be secured with hard lead cleats folded into the loose-locked joints; the other end of the cleat being nailed free of the lead sheet.

(50) Valley sheets shall extend outward on each side from the center line of all valleys for a distance of at least *(Specify distance.)*

(Use 51 for ½ pitch and steeper and 52 for less than ½ pitch.)

(51) 7 inches

(52) 10 inches

(53) At the ridge line, the open portion of every valley shall be at least 2" wide, increasing in width at the rate of at least ½" per 8 ft. in length as it descends. Valleys uniform in width, and not less than 4" wide shall be used where their length does not exceed 8 ft.
(Use 54 for closed valleys.)

(54) Flashings for closed valleys shall be separate pieces so that there will be a flashing between each course of shingles. Each piece shall be set so as to lap at least 3" and to be entirely concealed by the shingles; shall be fastened with nails at the top edge only; shall be sufficient length to extend 2" above the top of each shingle and shall lap the flashing sheet below 3".

MISCELLANEOUS FLASHINGS

(55) Hip and ridge flashings—if used—shall extend over the center line of the hip or ridge on each side for a distance of not less than 3".

(56) Chimney flashing shall run up not less than 6" under the shingles and if of galvanized iron shall be backed up with non-drying bituminous mastic where they come in contact with the brick. Counterflashing shall extend to within 1" of the surface of the finished roof.

(57) Apron flashings shall extend to within 1" of the surface of the finished roof.

(58) Where saddles or crickets are formed back of chimneys, curves or similar vertical surfaces, they shall be carried not less than 10" under the shingles.

(59) Step flashing shall be used where vertical surfaces occur in connection with slopes. They shall be formed of separate pieces, shall turn up not less than 4" at any point, shall be built into the masonry, shall lap, generally 3" but in no case less than 2", shall not be soldered, shall follow the joints of masonry and shall be installed in reglets cut into these joints.

(60) Dormer flashings shall run up not less than 6" under the shingles and at least 8" up on the face and cheeks.

(61) Window caps and all other projections at points where leakage might occur must be provided with flashings, such flashings to extend up under the shingles of the side walls or other outside finish for a distance of at least 6".

(62) All pipes projecting through roofs shall be flashed and counterflashed. These flashings shall extend out on the roof, not less than 6". They shall be of sufficient length to cover the shingle course next below the pipe and to extend up under the straight course above as far as possible without being punctured by nails.

(Where plumbing vents are carried through roof surfaces, they are generally flashed by the Plumber with lead—the lead being carried up on the outside of the pipe to the top, folded over the top of the pipe and the edge fastened against the inner face of the pipe. In case this is left for sheet metal worker to install it should be done in that manner and lead should always be used.)

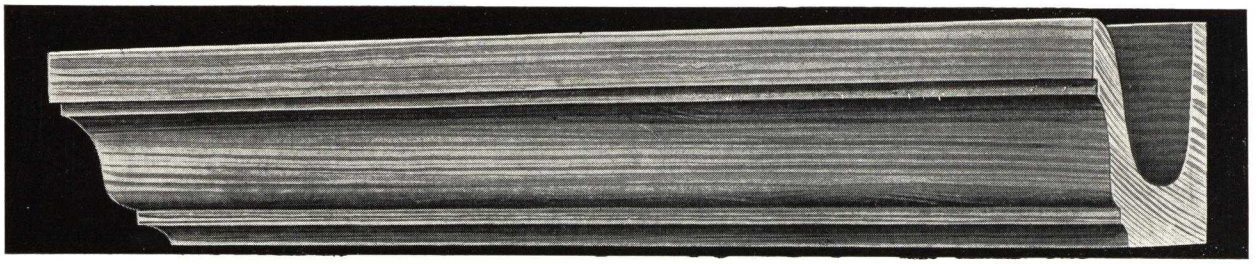
Flashings and counterflashings are required against brick walls, but for wood walls, flashings in shingle lengths are completely satisfactory

CERTIGRADE HANDBOOK

This 100-page booklet of shingle data contains complete information on the subject of CERTIGRADE Red Cedar Shingles. A copy of this book will be sent free to any architect, contractor or builder. Write Red Cedar Shingle Bureau, 5508 White Building, Seattle, Wash.

LONG FIR GUTTER COMPANY

CADIZ, OHIO



"Shadowline"—Distinctively Different in Quality and Design

EXCLUSIVE FEATURES OF "SHADOWLINE" FIR GUTTERS

Beauty of Design—"Shadowline" Fir Gutters are architecturally correct. Their excellent proportions and refined lines lend distinction to any cornice detail. They harmonize with any type of architecture, wall material and roofing. There are no hard angles or awkward curves to destroy a carefully designed effect. Moulded wood of correct design is always proper.

Properly Dried—And smoothly run from selected premium logs.

Permanence, Beauty and Economy—Unlike the hanging type of gutters with their Accessory Appearance, "Shadowline" Fir Gutters with their *correct architectural design* are *built-in.* They become an integral part of the building, serving the economical purpose of crown mould and gutter combined—adding *strength, rigidity* and *distinctive beauty* to the cornice construction.

Aluminum Coated—"Shadowline" Fir Gutters are furnished, at slight extra cost, pressure sprayed with aluminum carried in specially prepared vehicle. This penetrates and completely seals the pores, and forms an excellent wood preservative as well as a waterproof coating and an excellent base for finish painting.

Five Stock Sizes—Carried in stock. Dimensions given in table below.

Economy—First cost is no more than an ordinary gutter. Ultimate cost is less. No roof mould is necessary. Need be painted only when the house is painted with any good paint. When properly installed they last a lifetime.

LEAKPROOF BRASS FITTINGS

Solid brass fittings are available for ends, joints and miters which positively prevent leakage at these points. For straight butt and miter joints cut a saw kerf ¼-in. deep, exactly 1 in. from each finished end to be joined. Into these cuts drive the flanged brass plates which are 2 in. wide and secure with brass screws. For closing ends secure shaped flat brass plate with brass screws or cope out and return face mould. It is very important to seal the raw ends with any good protective coating.

ARCHITECTS' SPECIFICATIONS

Gutters shall be trade-marked "Shadowline" design O.G. Fir Gutters, thoroughly seasoned and aluminum coated as furnished by the LONG FIR GUTTER COMPANY, Cadiz, Ohio, attached to the building perfectly level so that straight horizontal lines necessary to appearance and correct architectural design may be retained. Secure gutters to building with zinc coated iron nails or coarse threaded brass screws. For making joints, miters and ends use specially designed Brass Leakproof Fittings as furnished by the LONG FIR GUTTER COMPANY. Down-spout connections shall be made as shown in details.

LONG FIR GUTTERS "Shadowline" Cadiz, O.

TRADE-MARK
Reg. U. S. Pat. Off.
Beware of imitations

Finish—Apply trim color of building to outside of gutter and give the inside, or trough, a thorough application of any good protective coating—preferably aluminum paint.

MANUFACTURE AND SHIPPING

"Shadowline" Fir Gutters are available through any retail lumber dealer anywhere in the United States. Approximately one-half million feet are stored in our Cadiz, Ohio, warehouse in assorted sizes, for prompt shipments.

L.C.L. shipments are bundled to protect them in transit and to insure arrival on the job in perfect condition.

STOCK SIZES—"SHADOWLINE" DESIGN

Trade size, in.	Finished size, in.	Back beveled and worked higher than front, in.
3x5	2 5/8 x 4 5/8	1/8
4x5	3 5/8 x 4 5/8	3/16
4x6	3 5/8 x 5 5/8	3/16
5x7	4 5/8 x 6 5/8	1/4
6x8	5 5/8 x 7 5/8	3/8

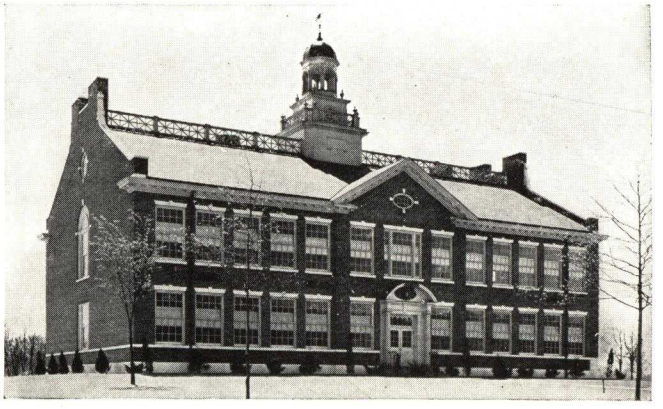
Reasonable allowance should be made from finished sizes for slight shrinkage in drying.

Lengths up to 40 ft. in all sizes for immediate shipment from Cadiz, Ohio.

USED BY MANY RAILROADS

Railroad structures provide a severe test for any gutter, due to disintegrating effect of smoke and gases. Probably there can be no stronger proof of the lasting qualities of "Shadowline" Fir Gutters than the fact that many Class 1 railroads are using them for stations, freight depots and all types of railway buildings with entire satisfaction. Some of these are: Pennsylvania, New York Central, Rock Island, Chicago & North Western, Atlantic Coast Line, etc.

6 x 8 "Shadowline" Fir Gutters on R. R. Marshbank Residence, Five Point Road, Greensburg, Pa.
P. A. BARTHOLOMEW, Architect



6 x 8 "Shadowline" Fir Gutters on Greenbrook School, North Plainfield, N. J.
A. N. KORFF, New York, N. Y., Architect

SKYLIGHTS AND VENTILATORS
- SECTION - 7

Section Number 1/5 Catalog Number

CATALOGS 1 to 37

MANUFACTURERS

THIS INDEX INCLUDES ONLY MANUFACTURERS WHOSE CATALOGS ARE FILED IN THIS SECTION

Adjustable Louver Corp. 7/32
Æolus Dickinson Industrial Div. Paul Dickinson, Inc. 7/16
Allen Corp. 7/18
American Sheet Metal Works. 7/35
American 3 Way-Luxfer Prism Co. 7/1
Arex Co.
Louvers 7/33
Roof Ventilators 7/17
Atlantic Steel Co. 7/34
Babcock-Davis Corp. 7/19
Bergmann, H. H. W., & Co. 7/36
Bruner, P. M., Granitoid Co. 7/14
Burt Mfg. Co. 7/20
Century Fan & Ventilator Co. 7/21
Drouvé, G., Co. 7/3
General Sheet Metal Works, Inc. 7/4
Hirschman, W. F., Co., Inc. 7/22
Howie Co. 7/5
Milcor Steel Co. 7/23
Overly Mfg. Co. 7/6
Penn Ventilating Co. 7/24
Pennsylvania Wire Glass Co. 7/11
Phoenix Ventilator Co. 7/25
Richards, Glendon A., Co. 7/7
Richards, J. Merrill. 7/8
Richards & Kelly Mfg. Co. 7/15
Riesner, Benjamin. 7/37
Robertson, H. H., Co.
Skylights 7/9
Ventilators 7/26
Roosevelt Sheet Metal Works. 7/27
Royal Ventilator Co. 7/28
Super-Steel Products Co. 7/12
Swartwout Co. 7/29
Uno Ventilator Co. 7/30
Van Noorden, E., Co. 7/10
Vent-O-Lite Co. 7/13
Western Engineering & Mfg. Co. 7/31

PRODUCTS

THIS INDEX INCLUDES ADDITIONAL INFORMATION WHICH IS FILED IN OTHER SECTIONS

Products described or illustrated in manufacturers' catalogs are indexed by section and catalog numbers. All names are listed alphabetically under each product heading.

AIR
Controlling Heads, see
—Ventilators
—Louvers; Dampers; Registers. 26
Defectors, see
—Ventilators
—Louvers; Dampers; Registers. 26
Diffusers, see
—Ventilators
—Louvers; Dampers; Registers. 26

ALUMINUM
See specific Product such as Skylights

BASES
Ventilator—Roof
See Ventilator—Bases

BLOWERS
Ventilator
See Ventilators—Roof Power

BRICK
Ventilators
See Ventilators—Wall

BRICK SIZE
Ventilators—Wall
See Ventilators—Wall—Common Brick Size

CEILING
Light Sash
See Skylights

CONTRACTORS
Skylights—Glass, Concrete and/or Steel Construction
Richards, J. Merrill. 7/8

CONTROLS
Ventilator Damper and Fan Motor
Hirschman, W. F., Co., Inc. . . . 7/22

CURBS
Steel Ventilator
See Ventilator—Curbs

DAMPERS
Ventilator
Hirschman, W. F., Co., Inc. 7/22

DAYLIGHT
Roof Construction
See Skylights—Glass, Concrete and/or Steel Construction

DEFLECTORS
Air
See Ventilators

DIFFUSERS
Air, see
—Ventilators
—Louvers; Dampers; Registers. 26

DOORS
Sidewalk—Vault Light
3 Way 7/1
American 3 Way Luxfer Prism Co. 7/1

EXHAUST
Ventilators
See Ventilators—Roof—Power Driven

FAN
Ventilators—Roof
See Ventilators—Roof—Power Driven

FLOOR
Lights
See Vaults—Sidewalk Lights—For

FLOOR CONSTRUCTION
Glass and Concrete
See Skylights—Glass, Concrete or Steel Construction

FLUE
Wall Outlets
See Ventilators—Wall—Common Brick Size

GABLE
Ventilators
See Ventilators—Attic Gable

GLASS
Concrete Construction
See Vaults—Sidewalk Lights for; Skylights — Glass — Concrete or Steel Construction
Roofs
See Skylights
Vaults—Sidewalk and Skylight
See Vaults—Sidewalk Lights for

GLAZING
Construction
See Skylights

HEATING AND VENTILATING
Apparatus
See Specific Item as; Ventilators

INSULATED
Skylight or Roof Lights
See Skylights; Vaults—Sidewalk Lights for

KITCHEN
Fans and Ventilators, see
—Ventilators—Wall — Common Brick Size
—Kitchen—Fans and Ventilators **26**

LIGHTS
Floor
See Vaults—Sidewalk Lights for
Roof
See Vaults—Sidewalk Lights for; Skylights — Glass and Concrete Construction
Transom—Prism—Store Front
3 Way-Luxfer 7/1
American 3-Way-Luxfer Prism Co. 7/1
Vault and Sidewalk
See Vaults—Sidewalk Lights for

LOUVERS
Wall Ventilating
See Ventilators—Wall for Brick, Concrete, Frame or Glass Construction

MUSHROOM
Ventilators
See Ventilators—Mushroom.... **26**

PAVEMENT
Lights
See Vaults—Sidewalk Lights for

ROOF
Hatches and Scuttles
See Hatch Covers or Scuttles... **13**
Lights
See Vaults—Sidewalk Lights for; Skylights—Glass, Concrete and Steel Construction
Ventilators
See Ventilators—Roof

ROOF CONSTRUCTION
Glass and Concrete or Steel Construction
See Specific Type of Skylight, as: Skylights—Glass and Concrete or Steel Construction
Skylights
See Skylights
Transparent or Daylight
See Skylights—Glass, Concrete or Steel Construction

ROOFING
Daylight
See Skylights—Glass, Concrete and Steel Construction
Transparent
See Skylights—Glass, Concrete or Steel Construction

SASH
Ceiling Lights
Vent-O-Lite Co. 7/13

SHUTTERS
Ventilating—Wall
See Ventilators—Wall for Brick, Concrete, Glass or Frame Construction

SIDEWALK
Doors
See Doors—Sidewalk—Vault Light
Lights
See Vaults—Sidewalk Lights for

SKYLIGHT
Curbs—Steel
Hirschman, W. F., Co., Inc..... 7/22
Specifications 7/22
Mounting—Vibration Isolation
RPM 7/9
Robertson, H. H., Co...... 7/9

SKYLIGHTS
Aluminum
Cibulas 7/4
General Sheet Metal Works, Inc. 7/4
Super-Steel Products Co...... 7/12
Vent-O-Lite Co. 7/13
Specifications 7/4; 7/12
Ceiling Light Sash
Vent-O-Lite Co. 7/13
Contractors for
American 3 Way-Luxfer Prism Co. 7/1
Richards, J. Merrill..... 7/8
Corrugated Wire Glass
CWG 7/11
Pennsylvania Wire Glass Co.... 7/11
Specifications 7/11
Glass, Concrete or Steel Construction
American 3 Way-Luxfer Prism Co. 7/1
Bronze-Grid 7/14
Bruner, P. M., Granitoid Co... 7/14
Clad-Crete 7/1
Federal-American Cement Tile Co. 3/32
Richards, J. Merrill..... 7/8
New Unity 7/8
Permalite Roofing 7/15
Richards & Kelly Mfg. Co..... 7/15
3 Way Daylight Roofing 7/1
Transparent Roofing 7/14
Specifications 3/32; 7/1; 7/14; 7/15; 7/8

THEATER
Stage Ventilators
See Ventilators—Theater Stage, etc.
Insulated
See Skylights—Heat and Glare Retarding
Puttied
See Skylights—Sheet Metal and/or Structural
Puttyless
American 3 Way-Luxfer Prism Co. 7/1
Anchor-Bar 7/10
Anti-Pluvius 7/3
Cibulas 7/4
Crescent 7/35
Drou-Ve-Lite 7/3
Drouvé, G., Co. 7/3
Duratite 7/10
Effico 7/22
General Sheet Metal Works, Inc. 7/4
Goodwin 7/6
Hirschman, W. F., Co., Inc..... 7/22
Howie Co. 7/5
Overly Mfg. Co...... 7/6
Peerless 7/5; 14/8
RPM 7/9
Richards, Glendon A., Co...... 7/7
Robertson, H. H., Co...... 7/9
Simplicity 7/7
Steelead 7/1
Super-Steel Products Co...... 7/12
Van Noorden, E., Co...... 7/10
Vanco 7/10
Vent-O-Lite Co. 7/13
See also 15/10
Specifications 7/4; 7/5; 7/6; 7/12; 7/22
Sheet Metal and/or Structural
(Including Copper and Steel)
American 3 Way Luxfer Prism Co. 7/1
Anchor-Bar 7/10
Anti-Pluvius 7/3
Cibulas 7/4
Crescent 7/35
Drou-Ve-Lite 7/3
Drouvé, G., Co...... 7/3
Duratite 7/10
Effico 7/22
General Sheet Metal Works, Inc. 7/4
Goodwin 7/6
Hirschman, W. F. Co., Inc..... 7/22
Howie Co. 7/5
Overly Mfg. Co. 7/6
Peerless 7/5; 14/8
RPM 7/9
Richards, Glendon A., Co...... 7/7
Robertson, H. H. & Co...... 7/9
Simplicity 7/7
Steelload 7/1
Super-Steel Products Co...... 7/12
Van Noorden, E., Co...... 7/10
Vanco 7/10
Vent-O-Lite Co. 7/13
See also 15/10
Specifications 7/4; 7/5; 7/6; 7/12; 7/22
Stationary
See Skylights—Glass, Concrete or Steel Construction
Ventilators for
See Ventilators—Skylight
Wire Glass
Bruner, P. M. Granitoid Co..... 7/14
Specifications 7/14

STAGE
Ventilators
See Ventilators—Theater, Auditorium Stage, etc.

THEATER
Stage Ventilators
See Ventilators—Theater Stage, etc.

TILE FORM
Glass for Vault and Sidewalk
See Vaults—Sidewalk Lights for

TRANSPARENT ROOF CONSTRUCTION
See Skylights

VAULT
Lights
See Vaults—Sidewalk Lights for
Ventilators
See Ventilators—Vault

VAULTS
Sidewalk Lights for
3 Way..... 7/1
American 3 Way-Luxfer Prism Co. 7/1
Bruner, P. M., Granitoid Co..... 7/14
Magnalite 7/8
New Unity..... 7/8
Richards & Kelly Mfg. Co...... 7/15
Richards, J. Merrill..... 7/8
See also.....13/43
Specifications.....7/1; 7/14; 7/15

VENTILATING
Brick
See Ventilators—Wall—Common Brick Size
Skylights
See Ventilators—Skylights

VENTILATOR
Bases
Burt Mfg. Co...... 7/20
Effico 7/22
Hirschman, W. F., Co., Inc..... 7/22
Phoenix Ventilator Co...... 7/25
Robertson, H. H., Co...... 7/26
RPM 7/26
See also 13/20
Specifications 7/22
Curbs—Steel
Hirschman, W. F., Co., Inc..... 7/22
Specifications 7/22

VENTILATORS
Attic—Gable
Adjustable Louver Corp...... 7/32
Airolite Co. 16/76
Air-Trol 7/32
American Blower Corp., Div. of American Radiator & Standard Sanitary Corp...... 26/2
American Sheet Metal Works.. 7/35
Arex Co...... 7/17
Atticvane 26/58
Breez-Air 26/54
Buffalo Forge Co......26/54
Burnham Boiler Corp...... 26/4
DeBothezat Ventilating Equipment Div. American Machine & Metals, Inc......26/56
Detroit Steel Products Co...... 15/9
Fenestra 15/9
Hoal's 7/35
Schwitzer-Cummins Co......26/112
Sturtevant, B. F., Co......26/58
Ventura 26/2
See also.....7/18; 7/36
Specifications 7/35

VENTILATORS—Cont.
Auditorium
See Ventilators—Theater, Auditorium Stage, Elevator Shaft, etc.—Automatic
Automatic—Stage
See Ventilators—Theater, Auditorium Stage, Elevator Shaft, etc.—Automatic
Barn
See Ventilators—Roof
Gable
See Ventilators—Attic—Gable
Glass Top
See Ventilators—Roof
Ridge
Burt Mfg. Co...... 7/20
Century Fan & Ventilator Co... 7/21
Coolero 7/22
Dexter Heat Valve..... 7/29
Drouvé, G., Co...... 7/3
Hirschman, W. F., Co., Inc..... 7/22
Monovent 7/20
RPM.....7/9; 7/26
Robertson, H. H., Co......7/9; 7/26
Swartwout Co...... 7/29
See also..... 7/24
Specifications 7/29
Roof — Power Driven (Electric, Motor or Belt)
Aeolus Dickinson Industrial Div. Paul Dickinson, Inc...... 7/16
Airjector 7/29
Allen Corp...... 7/18
Arex Co...... 7/17
Burt Mfg. Co...... 7/20
Century Fan & Ventilator Co... 7/21
DeBothezat Ventilating Equipment Div. American Machine & Metals, Inc......26/56
Economy 7/17
Effico Wind-Electric..... 7/22
Electro-Wind 7/18
Free-Flow 7/20
Hercules 7/22
Hirschman, W. F., Co., Inc..... 7/22
Isolated F..... 7/22
LeRoy 7/22
Lornate 7/22
Mototurb 7/30
Penn Ventilating Co...... 7/24
RPM.....7/9; 7/26
Robertson, H. H., Co......7/9; 7/26
Roofvane 26/58
Royal Ventilator Co...... 7/28
Silent Church..... 7/22
Standard 7/20
Sturtevant, B. F., Co......26/58
Swartwout Co...... 7/29
Uno Ventilator Co...... 7/30
Western Engineering & Mfg. Co. 7/31
Specifications.....7/22; 7/30; 7/31
Roof — Revolving (Wind Propelled)
Airjector 7/29
Airout 7/31
Allen Corp...... 7/18
Burt Mfg. Co...... 7/20
Century Fan & Ventilator Co... 7/21
Effico 7/22
Flue Doctor..... 7/30
Hirschman, W. F., Co., Inc..... 7/22
Milcor Steel Co...... 7/23
Multi-Vane 7/18
Nu-Alpina 7/23
Penn Ventilating Co...... 7/24
Phoenix Ventilator Co...... 7/25
Rotohood 7/30
Swartwout Co...... 7/29
Uno Ventilator Co...... 7/30
Vanco 7/10
Western Engineering & Mfg. Co. 7/31
Specifications.....7/22; 7/29; 7/31

VENTILATORS—Cont.
Roof—Rotary
See Ventilators—Roof—Revolving
Roof—Stationary (Syphon and/or Gravity)
Aeolus Dickinson Industrial Div. Paul Dickinson, Inc...... 7/16
Alcoa 7/18
Arex-Auster 7/17
Arex Co...... 7/17
Arrow 7/30
Burt Mfg. Co...... 7/20
Century Fan & Ventilator Co... 7/21
Clay Equipment Corp......21/88
Duo-Cone 7/25
Durr, A. & Co...... 4/40
Ferrocast 7/16
Firma 7/22
Forbes 7/31
Free-Flow 7/20
Hirschman, W. F., Co., Inc..... 7/22
J-M 6/32
Johns-Manville 6/32
Kernchen 7/17
K-S-V's 7/17
Liberty 7/24
Lornate 7/22
L-U 7/22
Milcor Steel Co...... 7/23
Nu-Air 7/23
Nuvents 7/16
Penn Ventilating Co...... 7/24
Phoenix Ventilator Co...... 7/25
Pul-Air 7/24
RPM.....7/9; 7/26
Robertson, H. H., Co......7/9; 7/26
Royal Ventilator Co...... 7/28
S-E 7/22
Standard 7/20
Super Firma..... 7/22
Syphonaire 7/31
Transite 6/32
Uno Ventilator Co...... 7/30
Vanco 7/10
Western Engineering & Mfg. Co. 7/31
See also.....21/89; 26/71
Specifications.....7/22; 7/28; 7/31
Skylight
(Including: Aluminum, Sheet Metal and Puttyless)
American 3 Way-Luxfer Prism Co. 7/1
Cibulas 7/4
Effico 7/22
General Sheet Metal Works, Inc. 7/4
Hirschman, W. F., Co., Inc..... 7/22
Louden Machinery Co......21/89
RPM 7/9
Richards, Glendon A., Co...... 7/7
Robertson, H. H., Co...... 7/9
Roosevelt Sheet Metal Works.. 7/27
Simplicity 7/7
Vent-O-Lite Co...... 7/13
See also.....15/26
Specifications.....7/7; 7/22
Syphon and/or Gravity
See Ventilators—Roof—Stationary
Theater, Auditorium Stage, Elevator, Shaft, etc.—Automatic
American 3 Way-Luxfer Prism Co. 7/1
KuPe 7/1
Roosevelt Sheet Metal Works.. 7/27

VENTILATORS—Cont.

Vault

Bankers Electric Protective Assn. 21/40
Mosler Safe Co. 21/38

Wall—Common Brick Size

Riesner, Benjamin 7/37; 26/118
Specifications 7/37; 26/118

Wall—for Brick, Concrete, Glass or Frame Construction

(Attic, Store Front, Boiler Rooms, Cold Rooms, Tunnels, Mausoleums)

Adjustable Louver Corp. 7/32
Aeolus Dickinson Industrial Div. Paul Dickinson, Inc. 7/16
Air-Trol 7/32
American Foundry & Furnace Co. 26/71
American Sheet Metal Works 7/35
Arex Co. 7/33
Arin Accelerant 7/33
Atlantic Steel Co. 7/34
Beco 7/36

(Continued in Next Column)

VENTILATORS—Cont.

Wall—for Brick, Concrete, Glass or Frame Construction—Cont.

(Continued from Previous Column)

Bennett Fireplace Co. 26/132
Bergmann, H. H. W., & Co. 7/36
Dickinson 7/16
DixieVent 7/34
Donley Brothers Co. 26/135
Ferrocast 7/16
Fiske, J. W., Iron Works 13/20
Hoal-Beco 7/36
Hoal's 7/35; 7/36
Panelouvre 16/79; 19/12
Riesner, Benjamin 7/37
Ventilouvre Co., Inc. 16/79; 19/12
Victor Vent 7/34; 13/20
U.S. 26/84
United States Register Co. 26/84
Windshield Scupper Div. Sargent Building Specialties Co. 13/45
Specifications 7/33; 7/34; 7/35; 7/36; 7/37

VENTILATORS—Cont.

Wall—Lightproof

Airolite Co. 16/76
Bar-Ray Products, Inc. 10/53

VENTS

Roof

Aeolus Dickinson Industrial Div. Paul Dickinson, Inc. 7/16
Barrett Co. 6/2; 27/19
Barrett-Holt 6/2; 27/19
Dickinson 7/16
Everson Mfg. Co. 21/69
Ferrocast 7/16
Holt 6/2; 27/19
Josam Mfg. Co. 27/26
Louden Machinery Co. 21/89
Zurn, J. A., Mfg. Co. 27/28
Specifications 6/2; 27/19

AMERICAN 3 WAY-LUXFER PRISM CO.

Daylight Engineers

2139 West Fulton Street
CHICAGO, ILL.

517 West 45th Street
NEW YORK, N. Y.

REPRESENTATIVES IN PRINCIPAL CITIES

For Diffusing Glass, see File Index

A COMPLETE LINE OF METAL SKYLIGHTS FOR ALL PURPOSES

Ventilating Skylights

American Ventilating Skylights are backed by over one million square feet of installations made during the last 15 years. They answer a definite need for a skylight that combines *natural and effective ventilation with daylight.* This type of skylight is furnished in puttyless and putty models. The sheet metal parts of these skylights can be furnished in galvanized copper bearing steel, aluminum or copper. Ventilating sash is carried on substantial steel trusses spaced approximately 6 ft. on centers. No truss members less than 2x1½x⅛-in. angles.

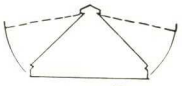
Generally the types may be described as follows:

Type J

Type J—A full ventilating type, wherein the sash is hinged at the ridge and opened from the curb, thus providing a maximum vent area. Each side is controlled by a separate operator.

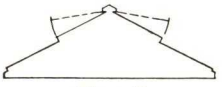
Type F

Type F—A ridge ventilating type, consisting of a pair of constant sized movable sash at the ridge and fixed sash below. Both vent sash may be operated independently or simultaneously by means of a single control. Provides maximum weather-tightness with efficient ventilation and daylighting.



Type JR

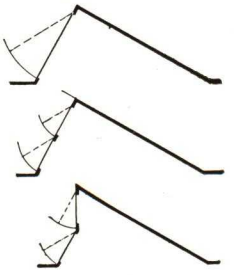
Type JR — A full ventilating type, designed especially for use on widths under 6 ft. Also applicable as a continuous ridge ventilator for sawtooth construction.



Type JL

Type JL—A ridge ventilating type, designed for spans over 12 ft. The upper or vent sash is in widths corresponding to the standard Type J widths. Thus continuous ridge openings of 6, 8, 10 and 12 ft. may be had.

American Pressed Steel Top Hung Sash



These continuous top hung windows are formed of copper bearing galvanized steel and fabricated in sizes to conform with accepted practice.

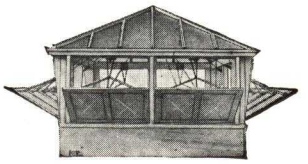
The sash is arranged for puttyless glazing with metal caps for the glazing bars secured with studs and cap nuts.

Operators are rack and pinion or tension type adapted to manual or motor control.

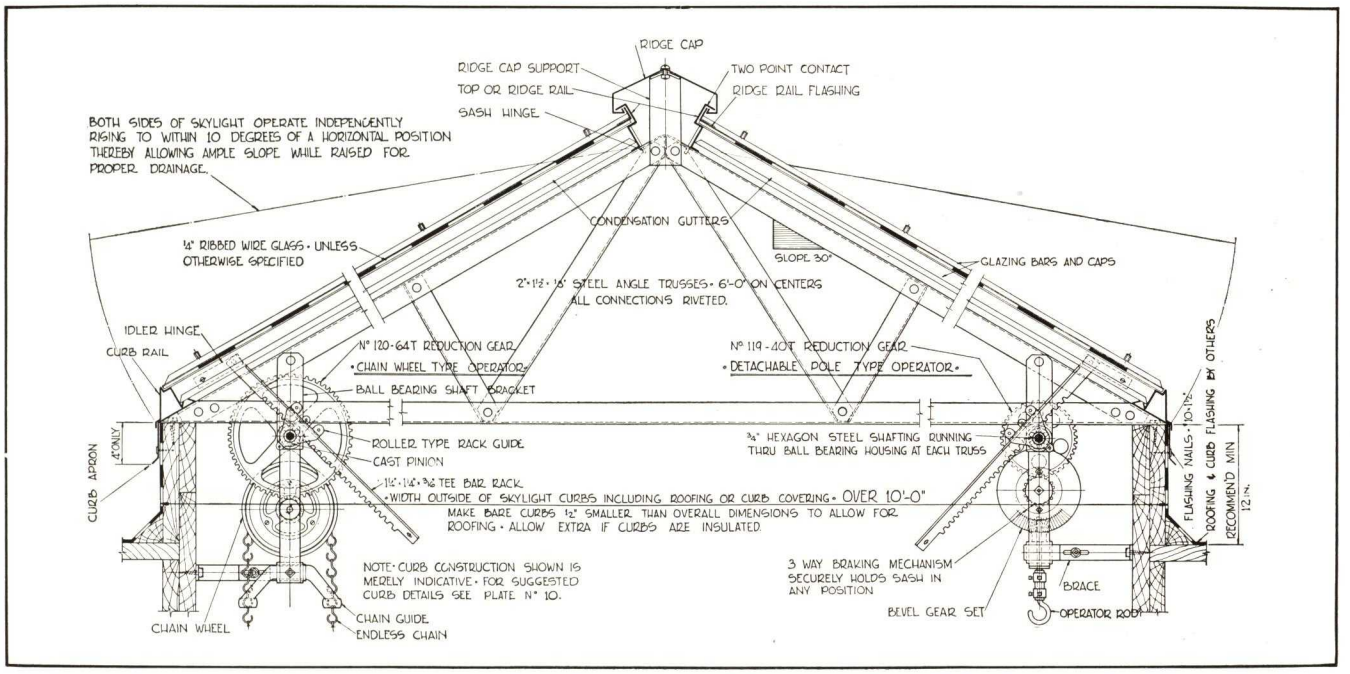
The KuPe Automatic Stage Ventilator

The KuPe Automatic Stage Ventilator No. 67 is approved by the Board of Fire Underwriters, architects and municipal authorities for theatres, schools, auditoriums, etc.

A combined ventilator and weatherproof skylight, it consists of a metal frame with hipped metal roof and sides provided with bottom hinged metal shutters. Flexible bronze cable equipped with fusible links, passes over brass pulleys and connects the top of each shutter to a main rope, also provided with fusible links, which extends down to the stage floor. Under ordinary conditions the shutters are hand operated, but in times of emergency may be quickly opened by cutting the rope. In case of fire, operation is effected either individually or simultaneously by melting of the fusible links.



"KuPe" Standard Automatic Stage Ventilator No. 67
(Patented)



TYPICAL 12' 0" TYPE "J" SKYLIGHT—OTHERS VARY

Sketches, layouts and technical information will be supplied without obligation, on request

Clad-Crete Skylight Construction.
3 Way Daylight Roofing.
3 Way Armored Sidewalk Lights.
3 Way Pressed Tile for Transom Lights.
3 Way Sheet Prism.
3 Way Ventilators, Ventilating Screens.
Magnalite Diffusing Glass.

3-WAY Daylight Products

Glass Dance Floors.
Weatherproofing Compounds.
Top Hung Sash.
Structural Double Pitch Skylights.
Ventilating Skylights.
Steelead Skylights.
Sidewalk Doors.

CLAD-CRETE ROOF-LIGHT CONSTRUCTION (Patented)

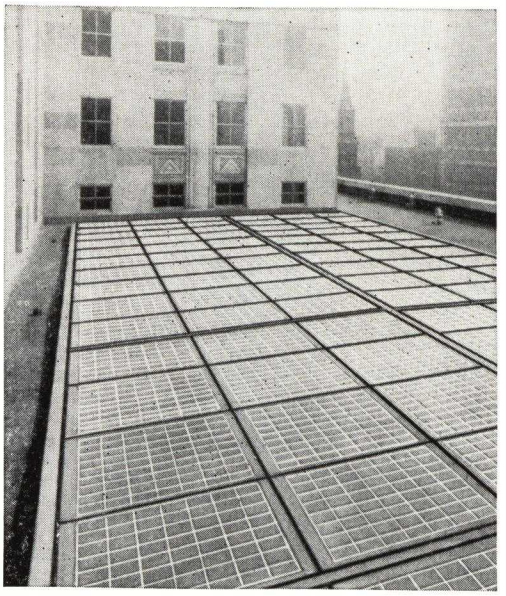
Clad-Crete is a flat, roof-light construction of reinforced concrete, bronze and glass. The frame supporting the square glass units is composed of concrete ribs extending in both directions across the skylight opening, and spaced so that the openings between the ribs are approximately the size of the glass units.

Embedded in the top of the concrete ribs are extruded bronze spacers into which the heavy glass units are glazed with waterproof 3 Way sulphur compound. Metal seats also inserted in the top of the ribs help support the glass. At no point is concrete exposed to the weather.

Around each skylight panel, and extending through the entire thickness of Clad-Crete construction, are expansion joints caulked with 3 Way elastic compound and securely flashed.

Thus it can be seen that Clad-Crete construction is weather-proof and trouble-proof. It is rigid, permanent, fireproof. It requires no protecting screens or guards. It can be safely walked upon. Moreover, being a flat construction, with heavy glass units and concrete ribs, Clad-Crete offers greater resistance to heat passage than metal skylights. But more important is the fact that Clad-Crete provides maximum daylight—and at a cost no greater than for ordinary types of flat, roof-light construction.

Clad-Crete roof-lights are adaptable for double glazing—and when double glazed, they are equivalent in efficiency to a double glazed window.



The double glazing is attached to the underside of the construction in such a manner that each glass is held separately and may be removed without disturbing the adjoining glasses.

Construction Features

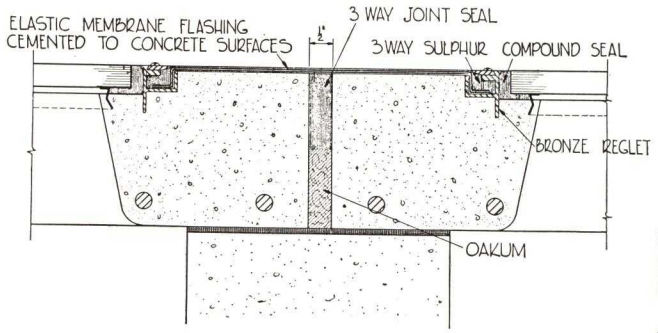
A successful roof-light installation must be leak-proof, giving the same satisfactory service year in and year out, as long as the building lasts. It must be permanent, fireproof, and it must assure the owner a minimum of maintenance expense. From the architect's viewpoint, it must be adaptable to all types of architectural design.

With these purposes in mind, the AMERICAN 3 WAY-LUXFER PRISM CO. developed Clad-Crete—a revolutionary roof-light construction which meets every requirement of the architect and owner.

Specifications for Clad-Crete

Skylights, where shown on plans, shall be two way reinforced concrete construction, with no concrete exposed to the elements, within the skylight area proper.

Construction details shall be the equivalent of Clad-Crete Construction, as manufactured by AMERICAN 3 WAY-LUXFER PRISM CO.

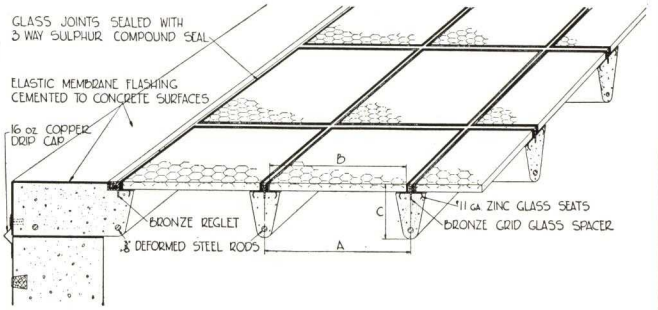


Pre-cast panels, 25-30 sq. ft. area, glazed, furnished for setting by others.

Ventilators may be applied to Clad-Crete construction if desired.

CONSTRUCTION DATA

Type of construction	Glass (wired)		Dimension, In.			Wt. per sq. ft., lbs.	Live load sq. ft., lbs.	Max. clear span, ft.-in.
	Ribbed	Rough	A	B	C			
Std. 9⅝ in. centers. Use ½ in. thick glass	Ribbed	Rough	9⅝	9	3⅝	30	125	8-2
Std. 18 in. centers. Use ⅝ in. thick glass	Ribbed	Rough	18	17⅜	4⅝	35	100	9-1
Std. 11⅝ in. centers. Use ½ in. thick glass	Ribbed	Rough	11⅝	11	4⅝	35	110	11-0
Std. 9⅝ in. centers	Magnalite tile (not wired)		9⅝	9	3⅝	30	125	8-2



3 Way Armored Sidewalk Lights

3-WAY Daylighting Products

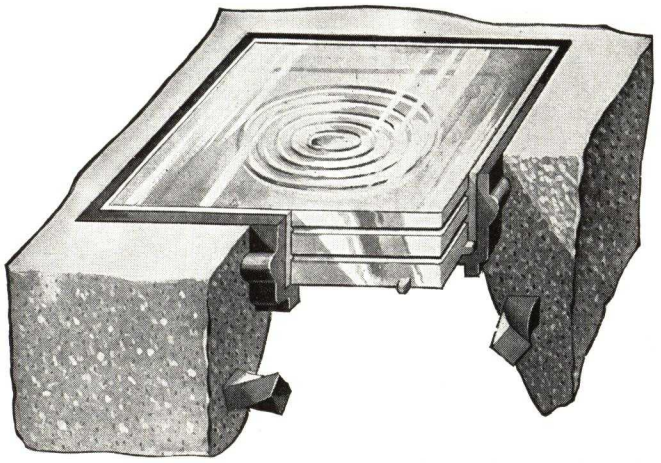
They daylight, they ventilate, they beautify, they advertise, they add distinction

Daylight in basements and vaults is more important today than ever. Sunlight and daylight make for health and efficient operations.

3 Way armored sidewalk lights accomplish this in more of a permanent way than any other light medium we know of.

Abundance of daylight. Lasting qualities in construction. And practically no maintenance cost.

Glass—Is armored by a heavy cast iron shield. Hot galvanized treated. Glass is sealed under special heat treatment with pure tar and sulphur compound in this shield, thus overcoming the detriments to glass from expansion pressure. Glass is Flintex-Lazalite quality free from internal stresses, each piece having passed polariscope test. Is made from special mixture for this purpose only.



Cut-away View of 3 Way Armored Glass, Showing Shield Embedded in Concrete

Instant Replacement of Glass—Should it become necessary to replace a glass unit, replacement can be made in a moment's time by any help about the building. No special skill required. This means sidewalk lights can be kept in perpetual good condition at practically no maintenance cost.

Five-year glass guarantee.

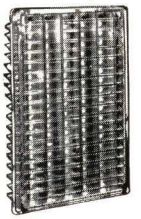
Specifications—Sidewalk Lights as shown on plans shall be of 3 Way Armored Glass Construction, Flintex-Lazalite Glass units sealed in galvanized cast iron shields, embedded in reinforced concrete construction.

Glass shall be No. 13-A (3½-in. square Fresnel lens in 4-in. galvanized cast iron shields spaced 5-in. centers), or No. 12 (2¾ in. round sunburst lens in 3-in. galvanized cast iron shields, spaced 4¼-in. centers). Glass for replacement to be supplied free of charge, f.o.b. factory for period of five years.

(Can be furnished in factory finished slabs or installed complete by manufacturer.)

3 Way Pressed Tile

3 Way Pressed tile are made special for light diffusion or redirecting light transmitted into interiors. They are designed for use in transom lights above store fronts or for windows where interior conditions require the redirection of daylight so as to light up dark spaces back in the interior which is without window space.



3 Way Lens Back Tile

Pressed tile can be had in the following combinations, Lux Lens with Spiro border, 3 Way Lens Back tile with Dew Drop border, Luxfer Flat Back with Geometrical border.

3 Way-Luxfer Sheet Prism

Glass cut to sizes from sheets as manufactured by Mississippi Glass Company. Ideal for industrial plants, basement windows, garages, etc. Obscure, maximum light diffusion and transmission. Furnished either plain or wired. Specify 3 Way Flat Back or Lens Back Sheet Prism.

3 Way-Luxfer Ventilator

3 Way-Luxfer Ventilators

Light weight inexpensive steel ventilators with copper, bronze or aluminum spray finish as desired. Also made in extruded shapes of aluminum or bronze. Vents are made pivoted or bottom hinged in several different types to suit any condition and are so constructed that they are adapted to any type of setting. Certain types are carried in stock sizes while other types can be furnished in sizes required. Ventilators are obtainable through your store front or glass contractor. Complete details furnished upon request.

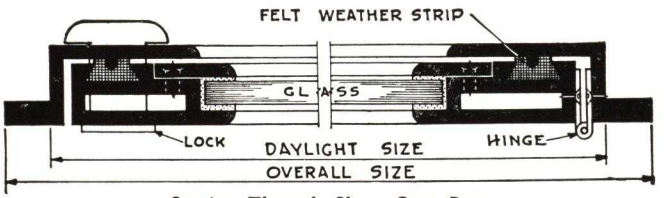
Specify 3 Way-Luxfer Ventilators.

Removable Flat Screens for Ventilators

Screens can be furnished for pivoted or bottom hinged ventilators. Unless otherwise specified screens are made of 16-mesh bronze, copper or aluminum wire cloth as the finish requires.

Show Case Doors

Show case doors are made of specially designed extruded shapes of either bronze or aluminum. A rigid outer frame welded at the joints supports the door and is adapted for setting in any type of store front construction and the weatherstripping provides an airtight and weatherproof door when closed. Furnished with cylinder locks, the doors are complete and ready for setting. Can be furnished in sizes to fit openings and details will be sent upon request.



Section Through Show Case Door

Sidewalk Doors

3 Way Type "C" watertight sidewalk door. Channel frame, tapped for drain connection, heavy bronze hinges, flush top, quality door. Hand lift or equipped for elevator lift.

MEMORANDA

THE G. DROUVÉ COMPANY

TELEPHONE
Bridgeport 5-3161

POST OFFICE ADDRESS
BRIDGEPORT, CONN.

FACTORY
Fairfield, Conn.

REPRESENTATIVES

DALLAS, TEX., R. J. DeWees, Burt Building
PHILADELPHIA, PA., Warren E. Quillman, 1411 Surrey Lane, Overbrook Hills, Montgomery County
DETROIT, MICH., Walter R. King Company, Curtis Building
ATLANTA, GA., Applewhite & Lawler Company

Products

"Anti-Pluvius" Puttyless Skylights, Type "A" and Type "B."
Drouvé Turret Sash.

DROUVÉ

"Drou-Ve-Lite" Puttyless Glass Structures, Type "C" and Type "D."
Drouvé Continuous Ridge Ventilators.

SKYLIGHTING FACTS

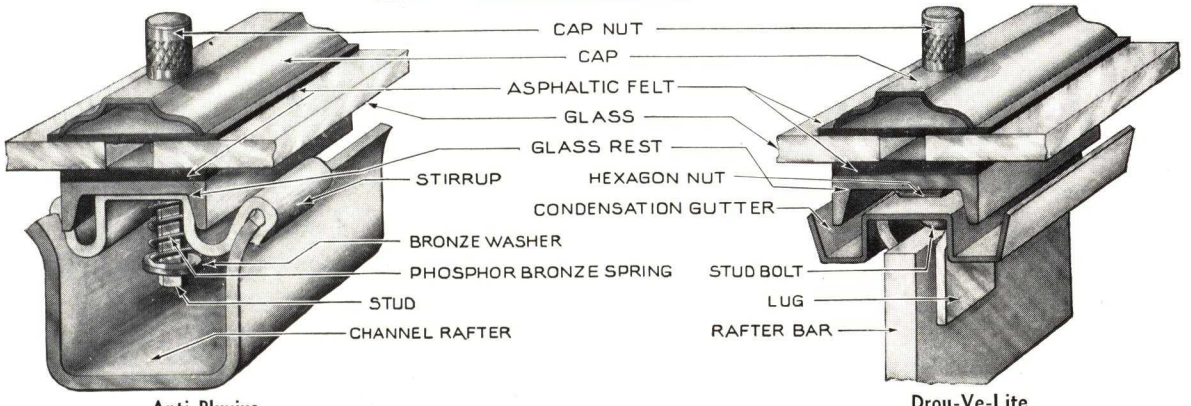
In selecting and purchasing Drouvé skylights for your requirements, you are, today, obtaining without cost, our 53 years of practical experience in the manufacturing and installing of puttyless skylights which is important.

We make the statement without fear of contradiction that at least 10 years of practical experience is required for a skylight construction before one knows very much about it; that is, as to its proper or improper functioning under actual atmospheric and climatic conditions. It is apparently simple enough to design a skylight on paper but time and experience have proven that only a very few of the numerous designs suggested in the past 40 years have actually proven satisfactory and even these have required changes in detail and construction based on experience.

Drouvé skylights are today, in their construction, based entirely on experience, the stage of theory long since having been passed. Drouvé skylights are constructed to successfully meet every atmospheric condition that re-acts against steel and glass. All of the metal members incorporated in our skylights are essential to proper skylight construction. The use of two separate members, one for the support of the skylight structure and the other for the glass rest, is one of the important features to be found in Drouvé skylights. Non-corrosive materials are used where they should be and all metals in our skylights are, as to gauge of materials, of the proper size for the work they are to do. Drouvé skylights are, in their present stage of perfection, the ideal constructions in materials, workmanship and long life.

Among other things, it is interesting to note that after 53 years, we are still using what is known as "lapped glass" rather than "butt glass" construction in our skylights. We do this, not because it makes for a cheaper construction, or, not because we cannot build a butt glass construction, but only that after exhaustive experimenting, we have definitely determined that it is not possible to butt glass in a skylight construction and have it give 100% satisfactory service. Unfortunately, the lapped glass method of construction is more expensive, in first cost, but again we remind you it is essential to good skylight construction.

In short, every Drouvé skylight built by us today is a monument to ourselves and a continuous source of satisfaction to those who own them and a credit to those architects who specify them.



Anti-Pluvius
One-half size

Drou-Ve-Lite
One-half size

DROUVÉ SKYLIGHTS

The "Anti-Pluvius" skylight shown in sketch above has our unconditional guarantee as to satisfactory service, materials and workmanship. It has, as you will note from the sketch, ten different parts in its construction aside from the glass. There are, of course, in addition to these, the curb and ridge members; all necessary to the end we have strived to achieve. All of these parts without exception are sufficiently heavy enough and strong enough for the work they are to do. This skylight is architecturally and structurally well balanced.

Above we show a sketch of our "Drou-Ve-Lite" skylight. The "Drou-Ve-Lite" skylight is our crowning achievement particularly for long span work.

We have incorporated in it the same essential features to be found in our "Anti-Pluvius" skylight, that make for proper skylight construction. This also has ten different parts in its construction aside from the glass. There are, of course, in addition to these, the curb and ridge members. Also, like our "Anti-Pluvius" construction, these parts, as to size and weight, are sufficiently heavy enough and strong enough for the work they are to do.

GENERAL SHEET METAL WORKS, INC.

Manufacturers of Cibulas Puttyless Skylights, Ventilators and Turrets

BRIDGEPORT, CONN.

CIBULAS SKYLIGHTS—NON-FREEZING, PUTTYLESS

(PATENT NO. 1656044—JAN. 10, 1928)

No Water—No Ice—No Trouble

In all Cibulas Skylights the breakage of glass is reduced to a minimum through the elimination of possible collection of water and its freezing. There is no chance for capillary attraction of water due to the thin but firm bearing of the metal. The glass is free to expand and contract at all times.

The freezing of water in skylights and the inability of the glass to expand and contract is the greatest cause of glass breakage.

Special Features

The skylight bars shown below are made of heavy gauge, non-corrosive metals—copper, aluminum or galvanized copper bearing iron, as desired or specified. Caps and gutters may be of lighter gauge.

They are designed for each job to support 35 or 40 lb. per sq. ft. to take care of snow or wind loads, the depth of the bars varying with the span.

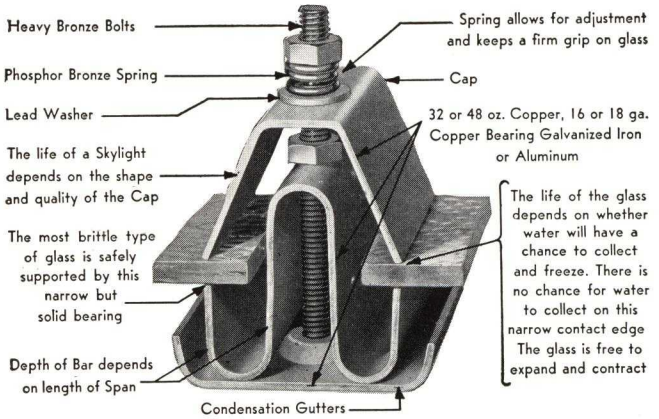
These bars are perfectly weathertight. They dispose of all condensation. Gutters are made large enough to carry off water and prevent accumulation of dust and dirt.

The Cibulas Puttyless Skylights are made in copper, aluminum and copper bearing galvanized iron. They are furnished with or without ventilation for hip, turret, sawtooth, double pitch and single pitch skylights. They are glazed with either ribbed or rough, plain or wire glass, or actinic glass.

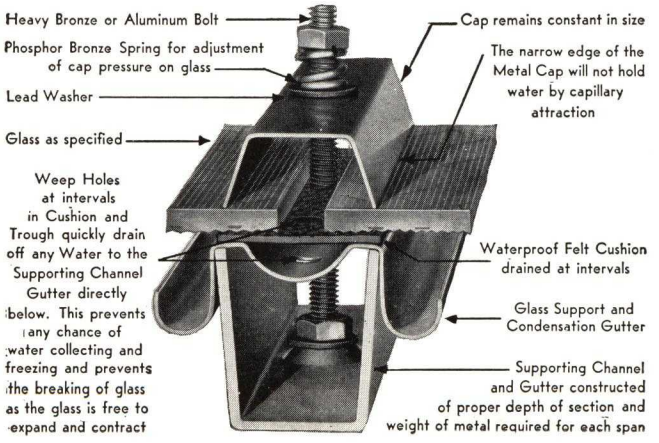
When desired, our engineers will furnish complete detail drawings and estimates without obligating the architect.

Installations

A list of installations will be gladly sent on request.



Non-Cushion Type Bar
(½ full size)



Cushion Type Bar
(½ full size)

Specifications for Cibulas Non-Cushion Type Puttyless Skylight

Galvanized Iron—Furnish and erect where shown on plans Cibulas Non-cushion Skylights as manufactured by the General Sheet Metal Works, Inc., Bridgeport, Conn. To be constructed entirely of galvanized iron with supporting members sufficiently heavy to support the load according to the span. Skylight shall be assembled with $\frac{5}{16}$-in. bronze bolts and nuts and phosphor bronze springs. There shall be no packing of any sort. Skylight shall be provided with condensation gutters. Glass shall be either ribbed or rough, plain or wire glass, or actinic glass.

Copper—Furnish and erect where shown on plans Cibulas Non-cushion Skylights as manufactured by the General Sheet Metal Works, Inc., Bridgeport, Conn. To be constructed entirely of copper with supporting members sufficiently heavy to support the load according to the span. Caps and condensation gutters shall be of 16-oz. copper. Skylight shall be assembled with $\frac{5}{16}$-in. bronze bolts and nuts and phosphor bronze springs. There shall be no packing of any sort. Glass shall be either ribbed or rough, plain or wire glass, or actinic glass.

Aluminum—Furnish and erect where shown on plans Cibulas Non-cushion Skylights as manufactured by the General Sheet Metal Works, Inc., Bridgeport, Conn. To be constructed entirely of aluminum with supporting members sufficiently heavy to support the load according to the span. Caps and condensation gutters shall be 24 B&S gauge aluminum. Skylight shall be assembled with $\frac{5}{16}$-in. aluminum bolts and nuts and phosphor bronze springs. There shall be no packing of any sort. Glass shall be either ribbed or rough, plain or wire glass, or actinic glass.

Specifications for Cibulas Cushion Type Puttyless Skylight

Galvanized Iron—Furnish and erect where shown on plans Cibulas Cushion Skylights as manufactured by the General Sheet Metal Works, Inc., Bridgeport, Conn. To be constructed entirely of galvanized iron with supporting member sufficiently heavy to support the load according to the span. Skylight shall be assembled with $\frac{5}{16}$-in. bronze bolts and nuts and phosphor bronze springs. Packing shall be used only as a glass rest. Skylight shall have a combined condensation gutter and trough punched at intervals with drain holes to carry off any moisture seeping in at the glass joints. Glass shall be either ribbed or rough, plain or wire glass, or actinic glass.

Copper—Furnish and erect where shown on plans Cibulas Cushion Skylights, as manufactured by the General Sheet Metal Works, Inc., Bridgeport, Conn. To be constructed entirely of copper with supporting member sufficiently heavy to support the load according to the span. Caps and condensation gutters shall be 16-oz. copper. Skylight shall be assembled with $\frac{5}{16}$-in. bronze bolts and nuts and phosphor bronze springs. Packing shall be used only as a glass rest. Skylight shall have a combined condensation gutter and trough punched at intervals with drain holes to carry off any moisture seeping in at the glass joints. Glass shall be either ribbed or rough, plain or wire glass, or actinic glass.

Aluminum—Furnish and erect where shown on plans Cibulas Cushion Skylights, as manufactured by the General Sheet Metal Works, Inc., Bridgeport, Conn. To be constructed entirely of aluminum with supporting member sufficiently heavy to support the load according to the span. Caps and condensation gutters shall be 24 B&S gauge aluminum. Skylight shall be assembled with $\frac{5}{16}$-in. aluminum bolts and nuts and phosphor bronze springs. Packing shall be used only as a glass rest. Skylight shall have a combined condensation gutter and trough punched at intervals with drain holes to carry off any moisture seeping in at the glass joints. Glass shall be either ribbed or rough, plain or wire glass, or actinic glass.

CIBULAS PUTTYLESS TURRETS

(PATENT NO. 1905802—APRIL 25, 1933)

After much experimenting, the GENERAL SHEET METAL WORKS, INC. have succeeded in developing a puttyless turret which is enduring and, to all practical purposes, faultless. Here are some of the many good features of this construction:

Heavy gauge galvanized iron, aluminum or copper.

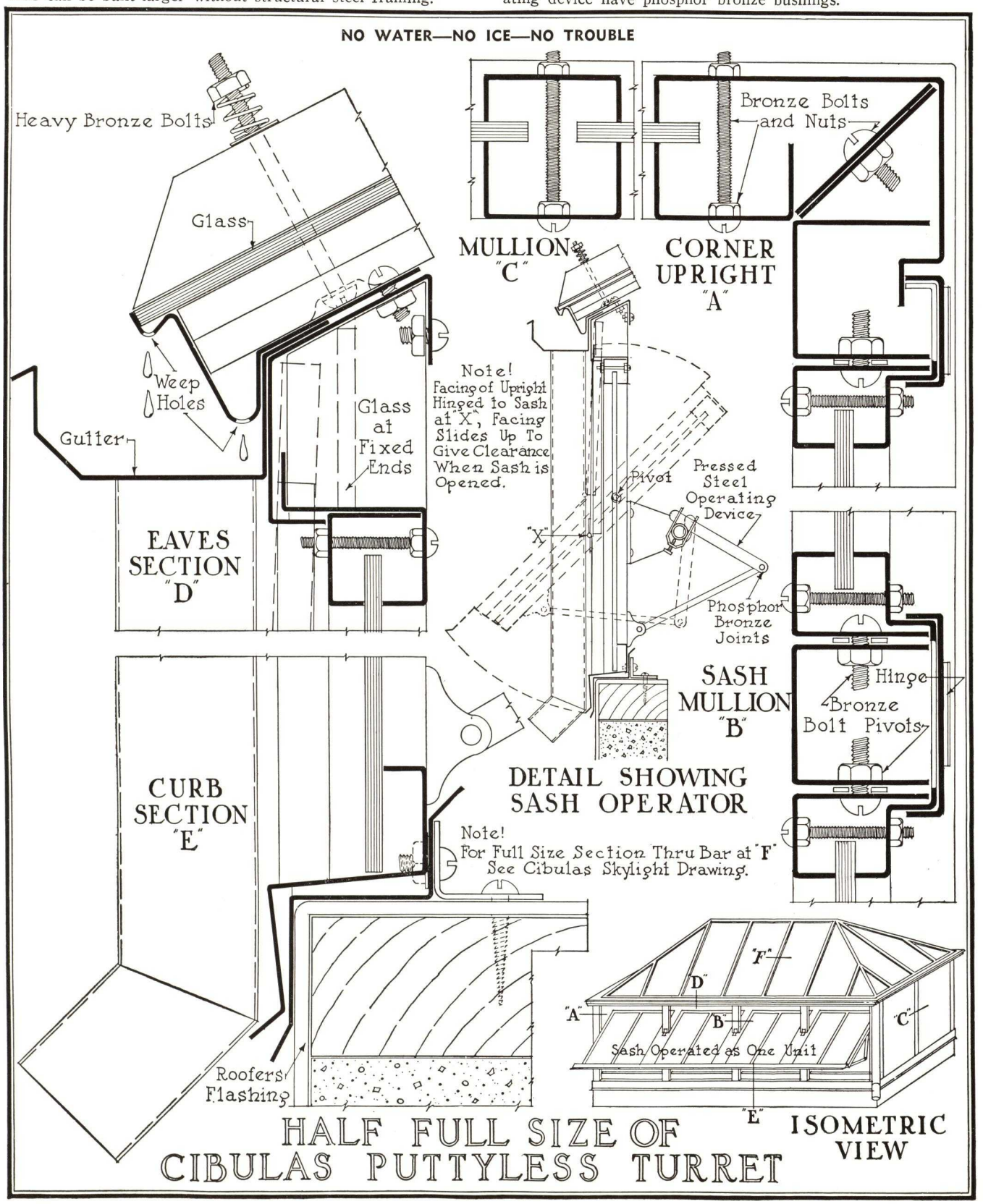
Two to three times heavier metal than ordinary construction, thus can be built larger without structural steel framing.

Rain and weather proof. No putty, packing or solder used.

Center pivoted sash, counterbalanced.

Greatest amount of ventilation.

Can be controlled from minimum to maximum ventilation. Easy in operation, opens in ten seconds. Principal parts of operating device of pressed steel. Movable joints of operating device have phosphor bronze bushings.



THE HOWIE COMPANY

Peerless Skylights

GENERAL OFFICE AND FACTORY
9011 Central Avenue, DETROIT, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES
For Howie Kalamein and Metal Clad Doors, see File Index

Products

PEERLESS SKYLIGHTS.

Also manufacturers of Kalamein Windows, Tin Clad and Metal Covered Doors, approved by Underwriter's Laboratories, Inc., Copper and Bronze Doors, Architectural Sheet Metal Work.

Adaptability

Skylights for railway terminals, power stations, machine shops, factories, foundries, office buildings and all other buildings where permanent skylights are required.

Peerless Skylights

Peerless Skylights are adaptable to any of the various forms of construction usually required in this branch of building work, including single pitch, gable, hip, sawtooth and dome types.

The sheet metal trimmings, such as caps, ridge, eave flashing and end flashing may be of No. 24 gauge galvanized iron or 16 oz. copper.

The bars are specially rolled solid steel sections, size 1¾x1¾ in., heavily coated with asphaltum paint and having ½ in. offset at 22 in. intervals.

The lights of glass are laid directly upon the steel bars and the caps holding them in place are laid in horizontal tiers beginning at the eaves, "L" shaped strips of asbestos felt are fitted into the angles formed between the glass and the stems of the bars, with glazing compound on the glass; before the caps are placed. The upper edges of the caps come 2 in. below the upper edges of the corresponding glass, and form resting places for the ends of the asbestos cross glazing strips and for the lower corners of the next tier of glass above.

Interior View of Skylight on Large Chemical Manufacturing Plant, Showing Glass Ends

Each section of caps is held in place by a brass cotter pin which slides in a slot in the stem of the bar, and is also secured by the next section of cap above, which laps over it at the offset.

The ridge is coped over and holds the upper ends of the topmost caps in place. Brass bolts and nuts at each bar secures the ridge. Standard spacing of bars for stationary skylight usually 24½ in.

Standard lengths of glass 24 in. for general use, odd glass not to exceed 36 in. in length.

The Peerless Skylight is self-supporting up to 17 ft. width of curb in the gable and hip types. In the case of the single pitch type, and gable and hip types of a span greater than 17 ft. the purlins shall be spaced not to exceed 8 ft. on centers. The above mentioned spans may be increased somewhat by narrowing down the glass widths from the standard 24 in. width to 22 in. or 20 in.

Any type of sheet metal ventilator can be used in connection with Peerless Skylights, either on the ridges or by means of the usual elbows in the ends of the gable types.

Specifications for Peerless Skylights

Intent—This specification together with the accompanying drawings and details is intended to provide for all labor and material required for the completion and erection of all skylights as shown or mentioned.

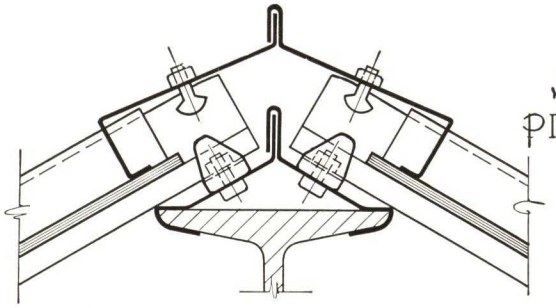
Work By Others—All steel framing, wood curbs, nailing strips, gutters and roof flashings, shall be provided for under another contract, unless otherwise specified.

Work Required—Provide and install all skylights as shown or indicated on drawings. All skylights shall be "Peerless" skylight construction as manufactured by THE HOWIE COMPANY, Detroit, Michigan, complete as shown by their standard details, and adapted to the construction of the building. All sheet metal trimming shall be of No. 24 gauge galvanized iron (or 16 oz. cold rolled copper).

Glazing—All skylights to be glazed with best quality ¼ in. rough wire glass not to exceed 24 in. in width. All glass to be left whole and clean at completion of work.

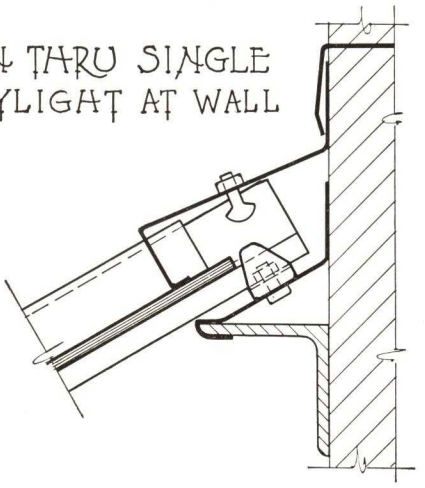
Painting—All metal work in connection with skylight, except copper, shall be painted; also paint all skylight bars with one coat of approved paint.

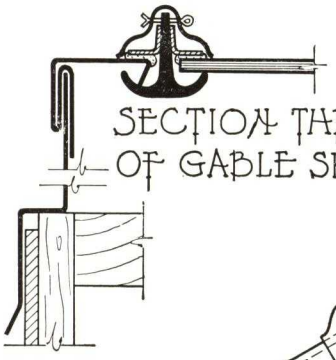
Guarantee—This contractor is to furnish a written guarantee for 5 years.



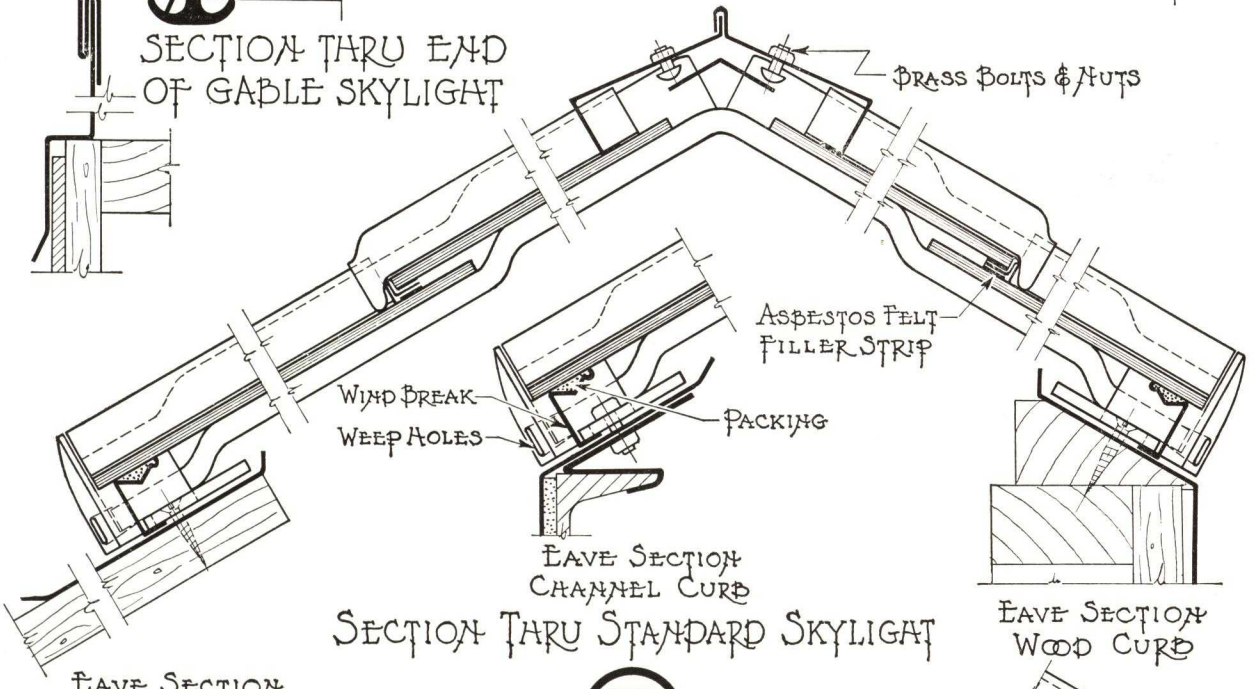
SECTION AT RIDGE OF SKYLIGHT SUPPORTED ON STEEL

SECTION THRU SINGLE PITCH SKYLIGHT AT WALL





SECTION THRU END OF GABLE SKYLIGHT

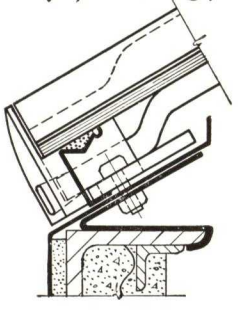


EAVE SECTION CHANNEL CURB

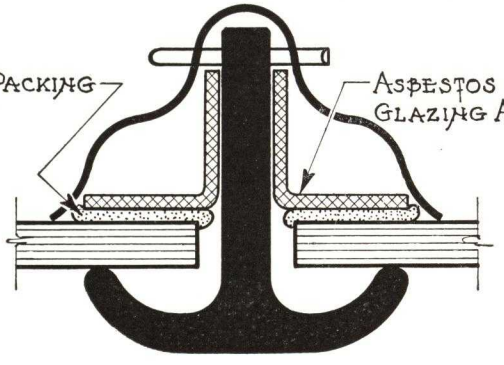
SECTION THRU STANDARD SKYLIGHT

EAVE SECTION WOOD CURB

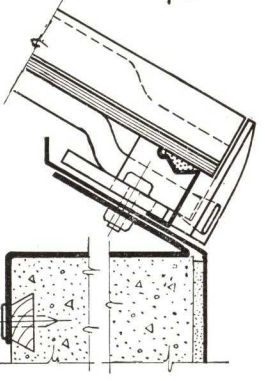
EAVE SECTION PITCHED ROOF



EAVE SECTION PLASTERED CURB



PEERLESS SKYLIGHT BAR
(FULL SIZE SECTION)



EAVE SECTION CONCRETE CURB

SCALE 3"= 1'-0" EXCEPT AS NOTED	TYPICAL CONSTRUCTION DETAILS **PEERLESS SKYLIGHTS**	THE HOWIE CO. DETROIT, MICH.

OVERLY MANUFACTURING COMPANY

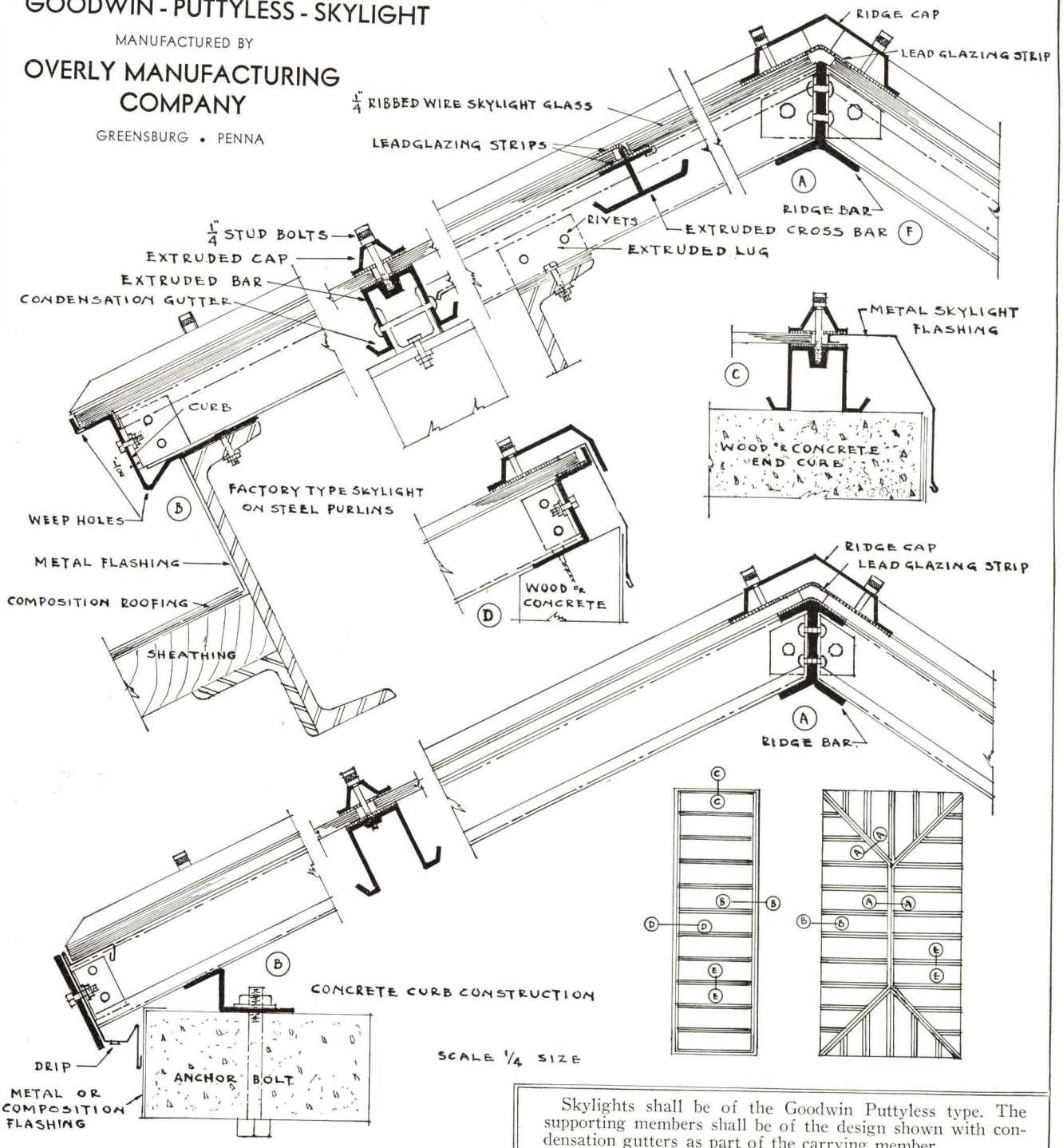
GREENSBURG, PA.

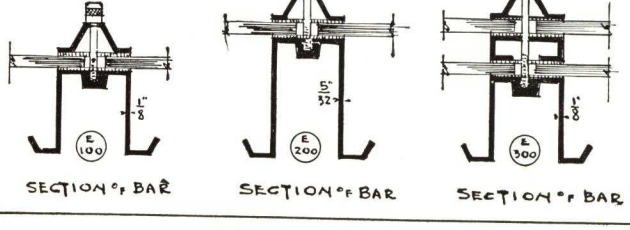
GOODWIN - PUTTYLESS - SKYLIGHT

MANUFACTURED BY

OVERLY MANUFACTURING COMPANY

GREENSBURG • PENNA





Skylights shall be of the Goodwin Puttyless type. The supporting members shall be of the design shown with condensation gutters as part of the carrying member.

Skylights may be entirely of extruded aluminum or bronze. Skylights are also made using steel for carrying members, curbs, anchoring angles and ridge members. All parts of this type skylight are easily accessible for future painting. Entire exposed parts (or trim) to be of galvanized iron, aluminum, copper, Monel or stainless steel. All skylights to be shop welded into panels for easy erection.

Experienced labor not necessary to erect skylights.

Send for literature showing our corrugated wire glass type skylights and double glazed sawtooth construction.

Our Engineering Department is at your service to assist in your problems.

GLENDON A. RICHARDS CO.

Winter Avenue and Blumerich Street, Northwest
GRAND RAPIDS, MICH.

SIMPLICITY PUTTYLESS SKYLIGHT

GENERAL DESCRIPTION

The Simplicity Puttyless Skylight is a thoroughly high quality product designed especially for use by the discriminating architect on the better classes of buildings to provide the maximum amount of daylight per square foot of area with the lowest maintenance cost. The construction lends itself to erection in the field with a minimum amount of time and labor.

The skylight consists of a steel supporting frame of tee rafters with angle curb and ridge members. The rafters are provided with sheet metal condensation gutters resting on malleable iron saddles secured to the tee rafters and spaced approximately 18 in. o.c., through which are secured the brass mounting cap bolts. Over the gutters the glass is laid, set in heavy, enduring came lead glazing channels. The mounting caps are set over the glass with bearing on the lead glazing channels compressing (through the brass bolts) the glazing channel firmly against both sides of the glass. The ridge cap and end flashing are then applied completing the assembly.

The skylight construction has been used on nationally known buildings designed by prominent architects.

MATERIALS AND ASSEMBLY

Frame—The skylight rafters are galvanized steel or aluminum tees, of sizes selected to suit the particular conditions. The ridge and hip members are of two sections of galvanized steel or aluminum. This construction permits the frame for each slope consisting of rafters, ridge, and hip members to be completely shop assembled. Field erection is thus reduced to bolting the two section members of hips and ridges together and anchoring frame to curb.

Malleable Iron Saddles—To support the condensation gutter and the brass cap bolts, galvanized malleable or aluminum saddle lugs approximately 18 in. o.c., are secured to the tee rafters.

Gutters, Caps, Ridge Covers and Flashings—No. 24 gauge lead coated metal; No. 24 gauge galvanized iron or aluminum; 16 oz. cold rolled copper; gutters, No. 22 gauge.

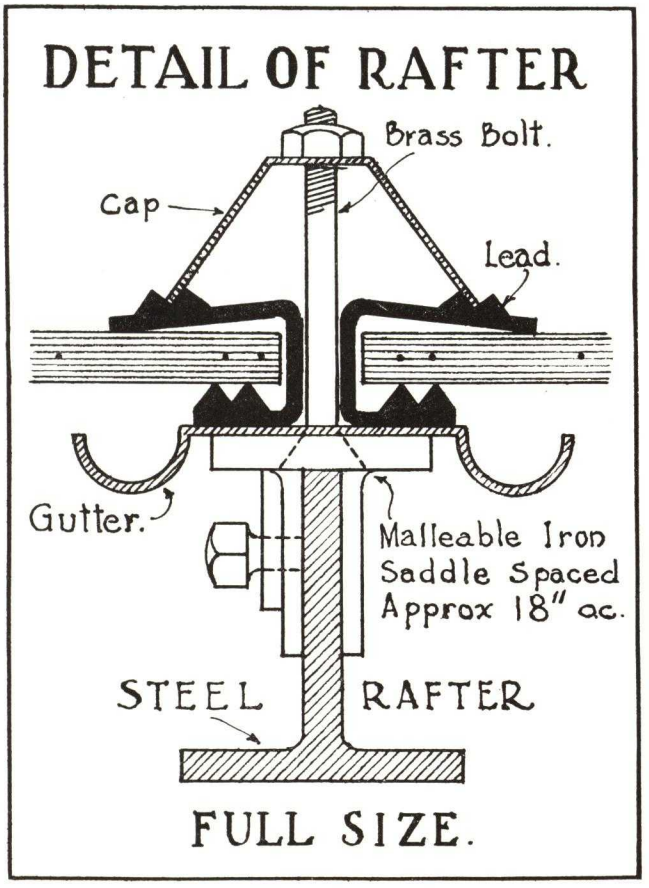
Glazing Strips—The glazing strips are of heavy, specially formed came lead. The soft lead takes up all unevenness in the glass surface with a continuous bearing, provides fully for contraction and expansion, thus reducing glass breakage and makes an absolutely wind and weather tight joint.

VENTILATOR

The Simplicity Skylight Ventilator provides ventilation where required. It is ridge-hinged, lift type and provided with efficient operating devices. They may be placed in any Simplicity Puttyless Skylight by removing the glass and substituting the ventilating unit. They are also made with flat flanges for use independently on shingle and composition pitched roofs.

ADVANTAGES

(1) Absolutely permanent weathertight construction.
(2) Maximum amount of dayight.
(3) All condensation conducted to the exterior.
(4) Lead glazing strip reduces glass breakage.
(5) Ease of erection with low labor costs.
(6) Ease of glass replacement.
(7) Moderate cost, quality considered.



SPECIFICATIONS

Furnish and erect where shown on plans Simplicity Puttyless Skylights as made by GLENDON A. RICHARDS Co., Grand Rapids, Mich., or equivalent fulfilling this company's established standards for materials and construction.

The design shall allow for free expansion and contraction of the glass or movement due to vibration. Each light of glass shall be entirely independent of every other light and the glass held laterally in a manner to prevent its contact with any rigid part of the skylight frame. The bearing of the glass shall be permanently flexible, adjusting itself to warpage or irregularities in the glass.

Sheet metal work for caps, gutters, flashings, etc., shall be *(specify material)*.

J. MERRILL RICHARDS

Richard's "New Unity" Skylights. Glass Roofs

TELEPHONE
South Boston 1667

119-122 West First Street
BOSTON, MASS.

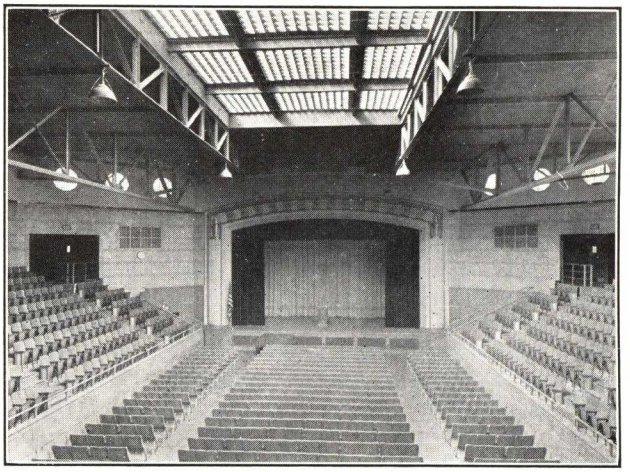
REPRESENTATIVES IN EASTERN CENTERS

For Magnalite Obscuring Diffusing Sheet Glass see Products Index for Glass (Obscuring-Diffusing)

CONSTRUCTION AND USES OF "NEW UNITY" HORIZONTAL SKYLIGHTS

"New Unity" Skylight Constructions

"New Unity" Skylight Construction does not depend on concrete for watertightness since no concrete is exposed to the weathering surfaces. Magnalite Diffusing Tiles or heavy ribbed wire glass units are placed into shields anchored in the supporting grid of reinforced concrete and glazed with a watertight tar and sulphur compound. The constructions are so designed that no concrete is exposed on top between the lights of glass. Reglets are provided in the concrete borders to receive the roofer's flashings so that *no concrete is exposed to the weathering surfaces in the entire skylight construction.*



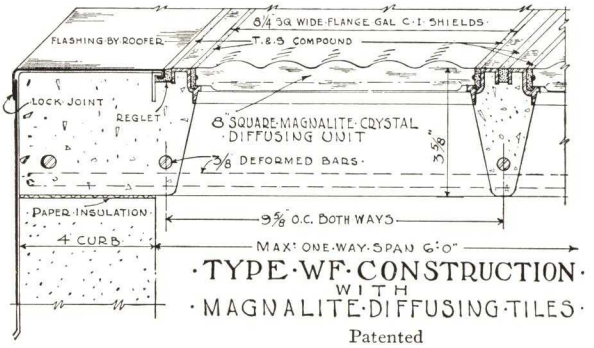
Magnalite Diffusing Tile Installation, Hovey Institute, Waltham, Mass.
DANIEL W. GIBBS AND KILHAM, HOPKINS & GREELEY ASSOC.
Note even distribution of sunlight

Feature—Magnalite Crystal Diffusing Tiles

The "Four-Way" light diffusing principle of Magnalite Diffusing Glass (see Products Index for Glass) is available in "New Unity" Skylights, Type WF. Magnalite Tiles will eliminate excessive interior sun glare and concentrated sun rays by spreading light of equal intensity over large areas beneath, the same shape as the skylight opening.

Diffusing Angles Average 50°.
Shadows Reduced to a Minimum — Soffit Highly Ornamental.
Excellent Interior Vision—Self-cleaning Top Surface.
Heat Diffusion.

Skylight openings glazed with Magnalite Tiles will produce better interior vision than larger ones glazed with ordinary glass. Skylight areas can be reduced without sacrificing daylighting results—*a saving in Winter heat losses, and less Summer heat admitted.*



Patented

Specifications

Richards' "New Unity" Glass and Reinforced Concrete Skylights Type WF having no concrete exposed to the weathering surfaces in the entire construction. The Glass shall be Magnalite Light Diffusing Tiles (or $\frac{7}{16}$ in. thick Ribbed Wire Glass). Reglets shall be left around the outside rows of glass units to receive the roofer's flashings where required.

Guarantee

Materials and workmanship are fully guaranteed in writing for each installation.

Where to Use Richards' "New Unity" Skylights

Architectural designs can be improved by the use of "New Unity" Skylights in *Interior Courts, Set Backs,* and on *Roofs* where steeply pitched skylights would be objectionably visible on the skyline.

Installation

Richards' "New Unity" Skylights are installed in place by mechanics skilled in the art.

PARTIAL LIST OF RICHARDS' SKYLIGHT INSTALLATIONS

Installation	Architect
Melrose High School, Melrose, Mass.	J. Williams Beal Sons
Christian Science Publishing Society Building, Boston, Mass.	Chester Lindsay Churchill
Albany Savings Bank, Albany, N. Y.	Henry Ives Cobb, Jr.
Seaside Hotel, Atlantic City, N. J.	Cook and Blount
Fitchburg High School, Fitchburg, Mass.	Coolidge, Shepley, Bulfinch and Abbott
Lynn Highland Elementary School,	George A. Cornet
Federal Reserve Board Building, Washington, D. C.	Paul P. Cret

Installation	Architect
Exeter Academy, Exeter, N. H.	Cram and Ferguson
U. S. P. O., Wilkes-Barre, Pa.	Federal Architects
Enoch Pratt Library, Baltimore, Md.	Friz and Friz
Middletown Savings Bank, Middletown, Conn.	Hopkins and Dentz
Norfolk Prison Colony, Norfolk, Mass.	McLaughlin and Burr
Quincy Market Canopy, Boston, Mass.	McLaughlin and Burr
U. S. P. O., Quincy, Mass.	John M. Gray Co.
Archives Building, Washington, D. C.	Parker, Thomas and Rice
English High School, Boston, Mass.	John Russell Pope
	Richmond and Leeds

H. H. ROBERTSON COMPANY

Robertson World-Wide Building System

PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CANADA; ELLESMERE PORT, CHESHIRE, ENG.

DISTRICT OFFICES, AGENCIES AND BRANCH OFFICES

ALLENTOWN, PA., H. N. Crowder, 446 Union St.
BALTIMORE, MD., H. H. Robertson Company, 1635 Baltimore Trust Bldg.
BIRMINGHAM, ALA., H. H. Robertson Company, 805-8 Protective Life Bldg.
BOSTON, MASS., H. H. Robertson Company (344 Rock Island Rd., Quincy, Mass.)
BUFFALO, N. Y., H. H. Robertson Company, 602 Jackson Bldg.
BUTTE, MONT., Archie W. Adams, 618 Metals Bank Bldg.
CHARLESTON, W. VA., Fireproof Products Co., 422 Professional Bldg.
CHARLOTTE, N. C., Edwin C. Boyette, Jr., 1025 Arosa Ave. (Box 27)
CHICAGO, ILL., H. H. Robertson Company, 360 No. Michigan Ave.
CINCINNATI, OHIO, H. H. Robertson Company, 1315 American Bldg.
CLEVELAND, OHIO, H. H. Robertson Company, 1526 Hanna Bldg.
DENVER, COLO., J. Q. Lalor, 1125 So. Vine St.
DETROIT, MICH., H. H. Robertson Company, 635 New Center Bldg.
EASTON, PA., H. N. Crowder, 103 No. Fourth St.
EAST ORANGE, N. J., H. H. Robertson Company, 25 No. Harrison St.
EL PASO, TEX., Warren D. Small, 311 Mills Bldg.
JACKSONVILLE, FLA., H. H. Robertson Company, P. O. Box 4523
KNOXVILLE, TENN., R. G. Jeffries, 409 W. Clinch Ave. (P.O. Box 2023)
LITTLE ROCK, ARK., Wherry & Co., 711 Rector St. (P.O. Box 282)
LOS ANGELES, CALIF., H. H. Robertson Company, 816 W. Fifth St.
MIAMI, FLA., Carl Adams, Hunting Lodge Dr. (Miami Springs)
MINNEAPOLIS, MINN., Hauenstein & Burmeister, 614 Third Ave., So.
NASHVILLE, TENN., John McDougal, 2210 Elliston Pl.
NEW HAVEN, CONN., H. H. Robertson Company, 207 Orange St.
NEW ORLEANS, LA., H. H. Robertson Company, 736 Whitney Bank Bldg.
NEW YORK, N. Y., H. H. Robertson Company, 475 Fifth Ave.
PHILADELPHIA, PA., H. H. Robertson Company, 1307 Real Estate Trust Bldg.
PITTSBURGH, PA., H. H. Robertson Company, 2000 Grant Bldg.
PORTLAND, ORE., Mercer Steel Company, 838 N. W. 13th Ave.
RICHMOND, VA., R. M. Nolting, 1103 E. Main St. (P. O. Box 1011)
ST. LOUIS, MO., H. H. Robertson Company, 1218 Olive St.
SALT LAKE CITY, UTAH, L. Brandenburger Co., 153 W. Second South St.
SAN FRANCISCO, CALIF., H. H. Robertson Company, 149 New Montgomery St.
SCRANTON, PA., F. H. Coffin, 210 Brooks Bldg.
SEATTLE, WASH., Arthur A. Dally, 332 Pioneer Bldg.
SYRACUSE, N. Y., F. J. Ludwick, 1126 Chimes Bldg.
TULSA, OKLA., Murray R. Womble, 316 Atco Bldg.
WASHINGTON, D. C., H. H. Robertson Company, 428 Woodward Bldg.

FOR ENGLAND: H. H. ROBERTSON CO., MERSEY IRON WORKS, ELLESMERE PORT, CHESHIRE

FOR CANADA: H. H. ROBERTSON CO., LTD.

TORONTO (MAIN OFFICE), 611 Metropolitan Building — MONTREAL OFFICE, 526 Confederation Building

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Products

ROBERTSON WEATHERPROOF SKYLIGHTS, SIDEWALL SASH, MONITOR SASH and SPECIAL SASH.

For Robertson Protected Metal (RPM), Protected Metal V-Beam Sheets, Ventilators, Louvers, Hoods and Ducts; Robertson Floor Wiring Method, and Robertson Steel Floor, see File Index.

TRADE-MARK

Patents

Robertson Weatherproof Skylights and Sash are protected by United States Patents No. 1,666,764; No. 1,668,564; No. 1,763,275; No. 1,792,704, and No. 1,803,514; also protected by other patents in the United States and foreign countries.

Other patents pending.

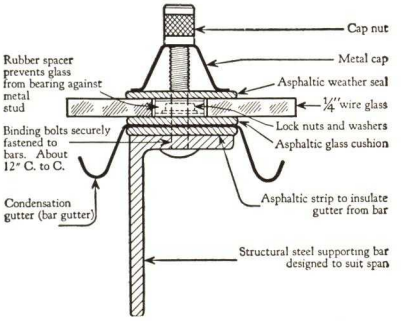
ROBERTSON WEATHERPROOF SKYLIGHTS (PUTTYLESS TYPE)

A skylight cannot be perfectly satisfactory until it is weatherproof. Realizing this, Robertson Engineers co-operated with fellows of the Mellon Institute of Industrial Research to produce a really weatherproof skylight. The Robertson Skylight sold today is unique, in that *it is perfectly weatherproof.*

New production methods, standardization and accurate calculation of the amount and location of glass necessary to produce the most daylight, make the Robertson Weatherproof Skylight the most economical buy in the skylight field.

Although many architects would not ask for more in a skylight than the quality of weatherproofness, the Robertson Skylight has the following additional factors of superiority:

(1) It is as strong as any other part of the building. Load-carrying members are structural steel bars, suited to the load and span, with a minimum thickness of $\frac{3}{16}$ in. However, bars can be furnished also in aluminum or brass. Coated bars are furnished where moisture condensation conditions are bad. Any engineer can check the strength of the steel bars with standard deflection formulas for steel structural members.



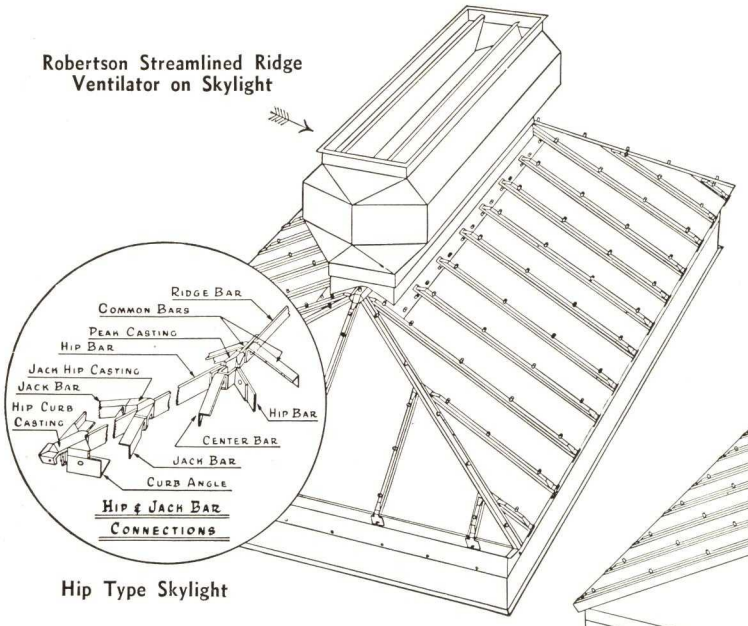
Cross-sectional View Showing Details of Robertson Glazing Construction

(2) Bar and condensation gutter are separated from each other by asphalt felt cushions.

(3) Asphaltic felt cushions are used between all glass and metal members.

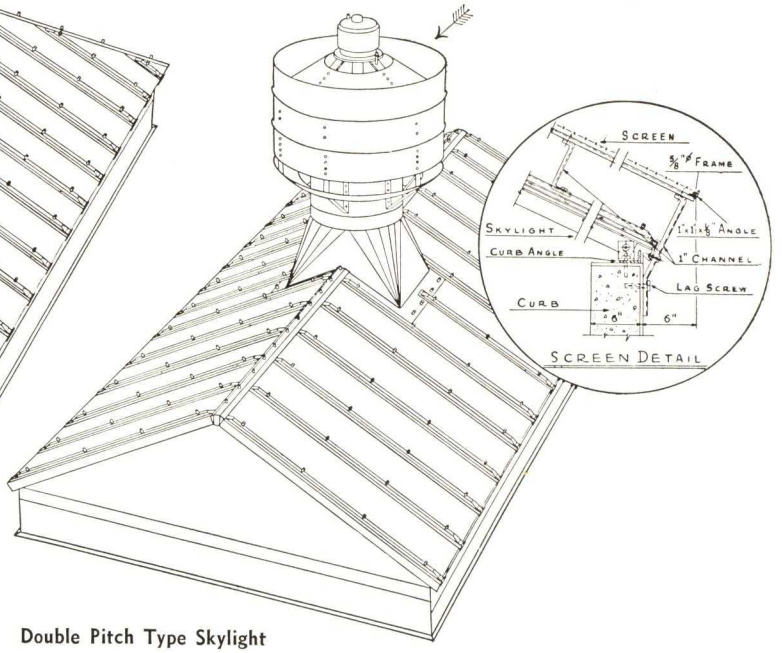
TYPES OF ROBERTSON WEATHERPROOF SKYLIGHT CONSTRUCTION

Robertson Streamlined Ridge Ventilator on Skylight



Hip Type Skylight

Robertson Fan Type Ventilator on Skylight



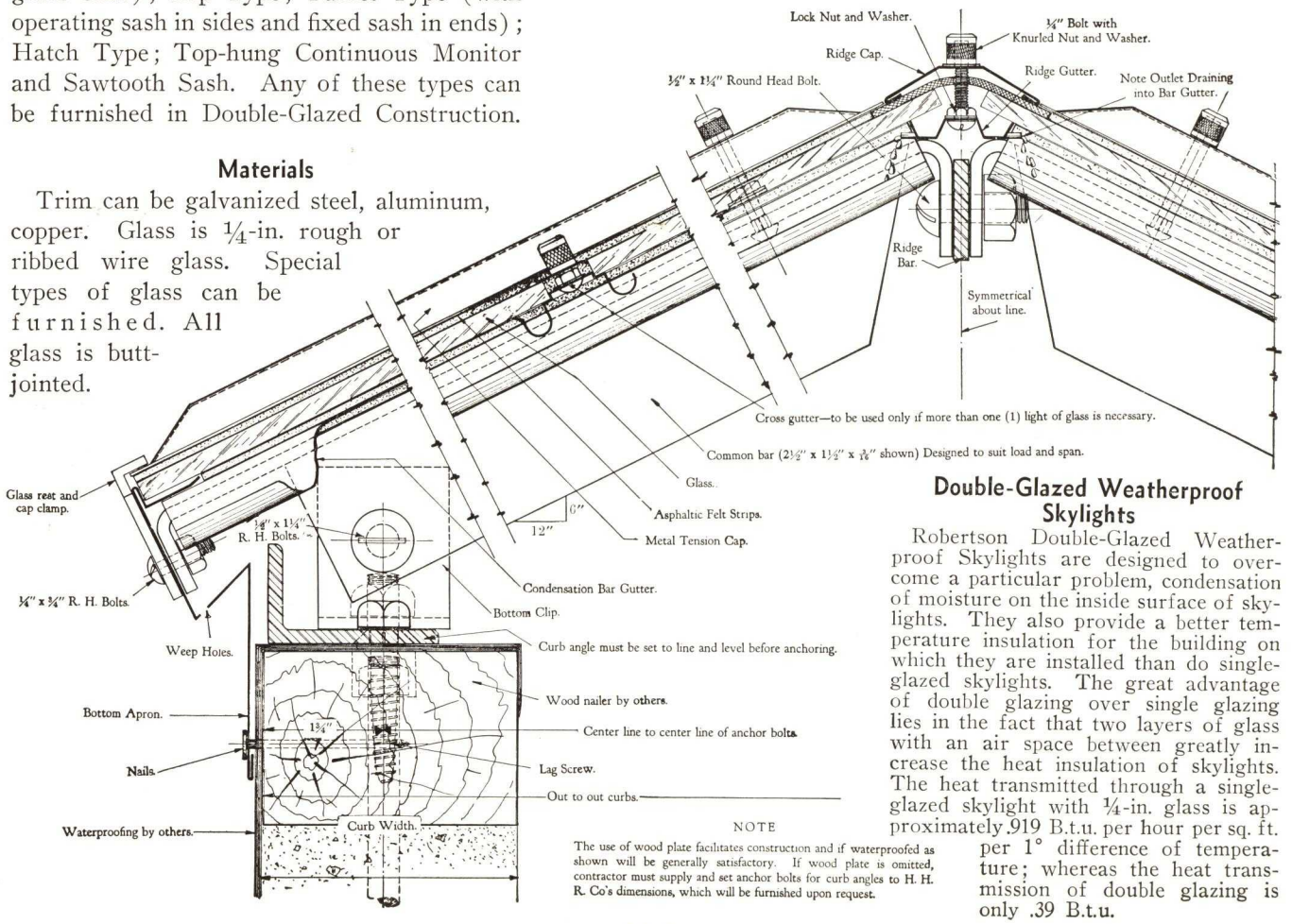
Double Pitch Type Skylight

Types

Single Pitch; Depressed Head (with top of skylight inserted under roofing and bottom raised above roofing to provide perfect watershed); Double Pitch (with glass or metal gable ends); Hip Type; Turret Type (with operating sash in sides and fixed sash in ends); Hatch Type; Top-hung Continuous Monitor and Sawtooth Sash. Any of these types can be furnished in Double-Glazed Construction.

Materials

Trim can be galvanized steel, aluminum, copper. Glass is ¼-in. rough or ribbed wire glass. Special types of glass can be furnished. All glass is butt-jointed.



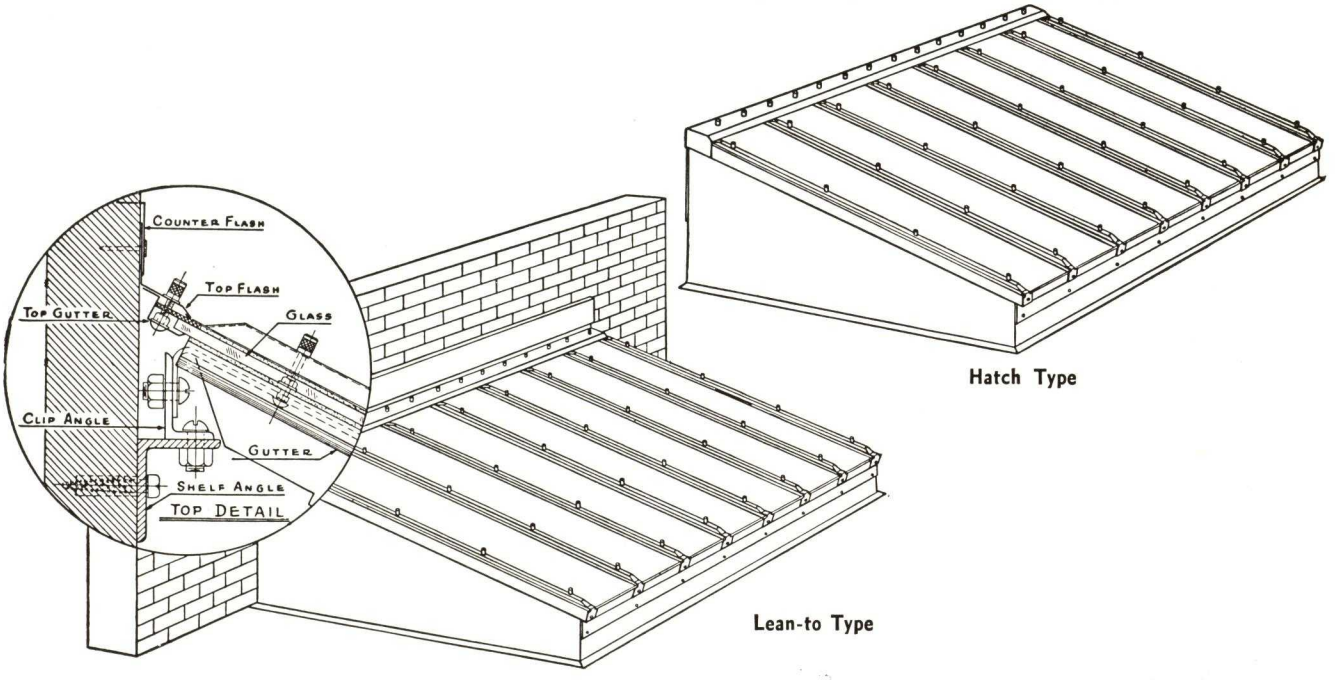
NOTE

The use of wood plate facilitates construction and if waterproofed as shown will be generally satisfactory. If wood plate is omitted, contractor must supply and set anchor bolts for curb angles to H. H. R. Co's dimensions, which will be furnished upon request.

Double-Glazed Weatherproof Skylights

Robertson Double-Glazed Weatherproof Skylights are designed to overcome a particular problem, condensation of moisture on the inside surface of skylights. They also provide a better temperature insulation for the building on which they are installed than do single-glazed skylights. The great advantage of double glazing over single glazing lies in the fact that two layers of glass with an air space between greatly increase the heat insulation of skylights. The heat transmitted through a single-glazed skylight with ¼-in. glass is approximately .919 B.t.u. per hour per sq. ft. per 1° difference of temperature; whereas the heat transmission of double glazing is only .39 B.t.u.

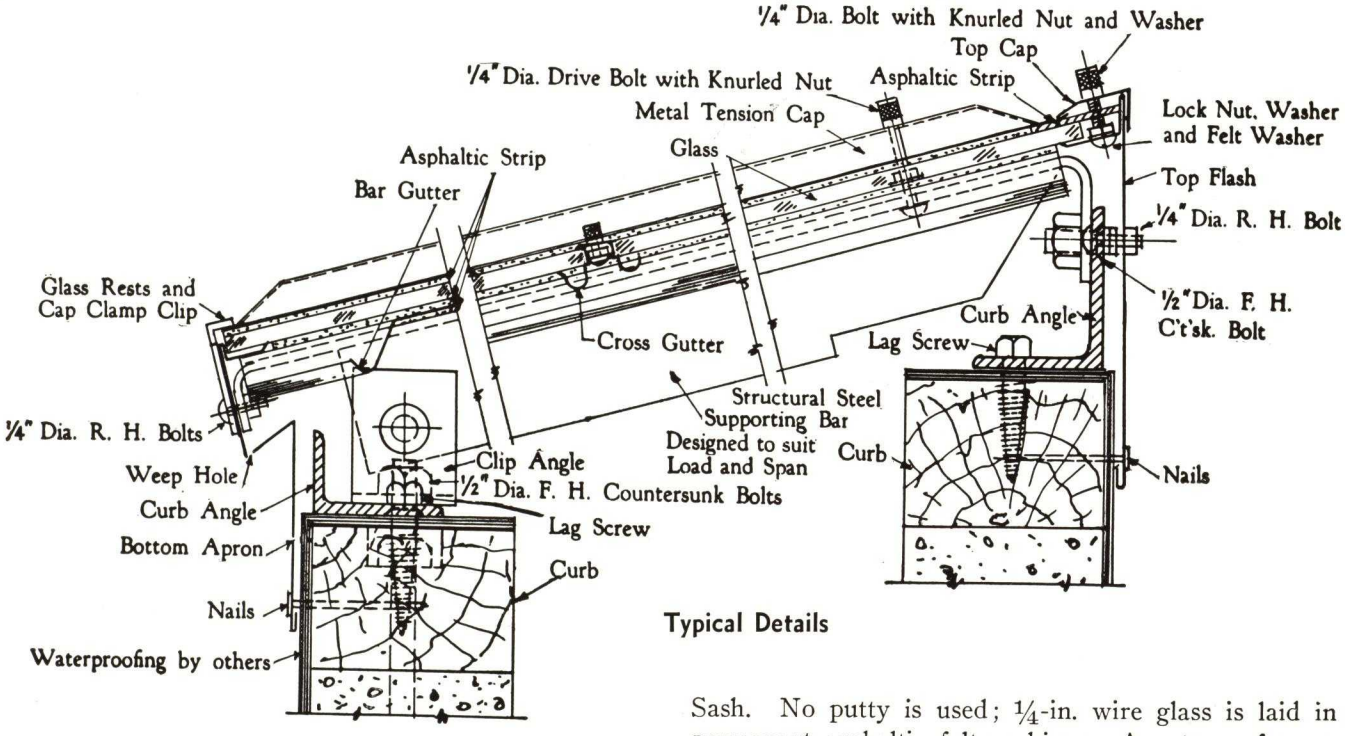
TYPES OF ROBERTSON WEATHERPROOF SKYLIGHT CONSTRUCTION



Hatch Type

Lean-to Type

ROBERTSON SINGLE PITCH WEATHERPROOF SKYLIGHT



Typical Details

ROBERTSON SIDEWALL SASH (PUTTYLESS TYPE)

Designed and fabricated like the steel framework of the building. Entire weight of steel is concentrated in load-carrying bars. Intermediate glass-supporting bars are eliminated. Large panes of glass (up to 6x2 ft.) are used. Sash can be furnished in single- or double-glazed construction. The sash does not sag. There is no network of small bars to rust out. No load-carrying member has ever had to be replaced in any Robertson Sash. No putty is used; ¼-in. wire glass is laid in permanent asphaltic felt cushions. Any type of operator desired may be used.

ROBERTSON FLOATING MOUNTING SKYLIGHT

This unique skylight, also weatherproof, was designed by Robertson Engineers for use where vibration is especially bad, as in forge shops. Installations have proved that glass in these skylights will seldom break under vibrations that would otherwise prevent the use of skylights altogether.

ESTABLISHED 1873

E. VAN NOORDEN COMPANY

Manufacturers of Vanco Skylights, Ventilators and Sheet Metal Work

TELEPHONE
Highland 3040 to 3042

100 Magazine Street, BOSTON, MASS.

NEW YORK REPRESENTATIVE, Kenneth Hargreaves, 155 E. 42nd Street, NEW YORK, N. Y.

CANADIAN MANUFACTURERS, Geo. W. Reed & Co., Ltd., 4107 Richelieu Street, MONTREAL, QUE.

PRODUCTS

Manufacturers of DURATITE and ANCHOR BAR ROLLED STEEL SKYLIGHTS.

Load carrying members also in bronze and aluminum.

Also manufacturers of Stationary and Revolving Ventilators, Steel Nailing Bucks, Kalamein Work, Bois Steel Stairs, Sheet Metal Work.

Note: Constructions shown on this page are thoroughly protected by United States and Canadian Patents.

DURATITE SKYLIGHT (Patented)

The Duratite Skylight combines steel for load carrying members, and copper or other non-corrosive metal for trim and drainage members.

Steel Work—1½x2-in. Steel Tees—approximately 24-in. o.c. Combined with continuous steel base angles and steel ridge and hip members, provide a self-supporting steel structure of great strength. All connections to bars top and bottom consist of steel plates welded to bars. Bolts are used only for field connections.

Trim—Sheet metal portions are of copper, leadcoated copper or aluminum independently applied to the steel structure. This permits a free movement of the imposed members so that expansion and contraction will not affect the weather tightness of the skylight.

Caps (Patented)—Are made with closed ends. They seal the joint at head by flashing into ridge cap. They are underlaid with a weather strip of heavy saturated felt in contact with the glass.

Vanco Saddles and Bolts (Patented)—Bronze saddles are clinched to bars at 20-in. intervals. In combination with ¼-in. brass bolts, they draw the cap and stripping down in contact with the glass. No snapping of bolts due to expansion and contraction as the saddles permit a free movement.

Bar Gutters (Patented)—The bar gutter encases the flange of steel tee. The special form of the bar gutter permits the application of the saddles above the gutter member—thus there is no penetration of the gutter member by the cap bolt and no possibility of moisture reaching the steel.

Base Gutter and Apron—Collect and drain condensation and protect lower steel portions. Apron serves as cap flashing for roofer's base flashing.

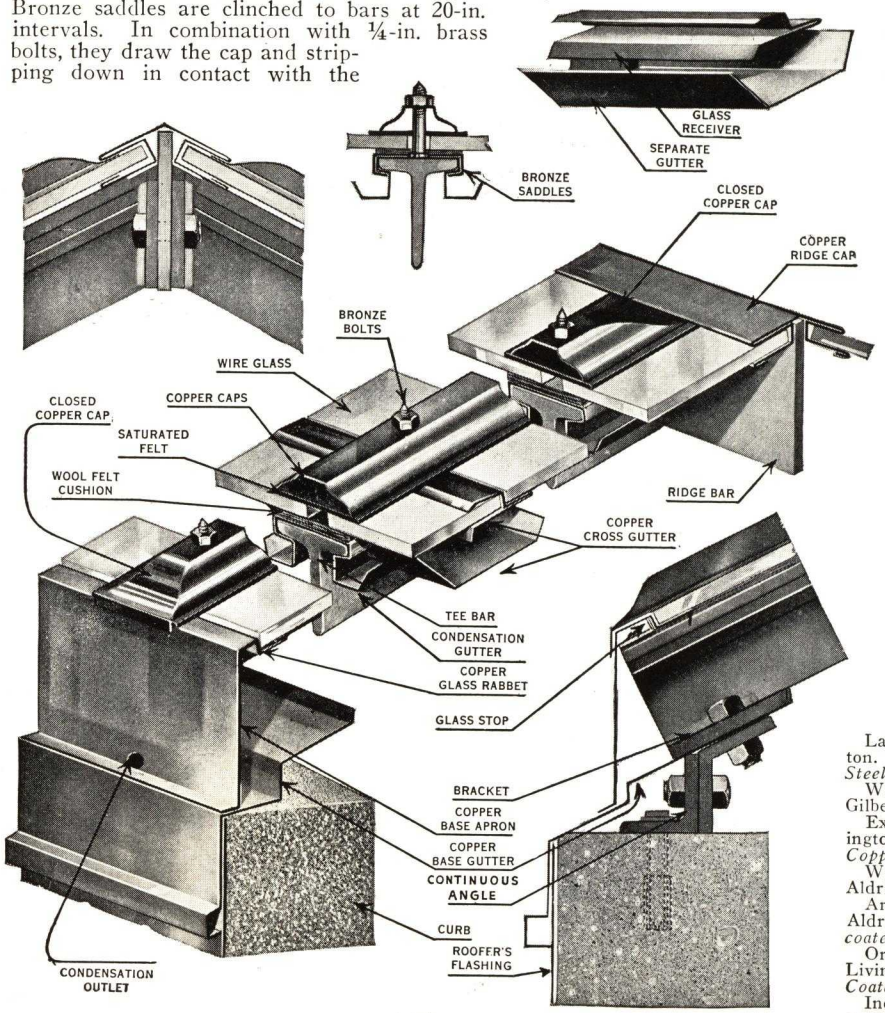
Vanco Double Cross Gutters (Patented)—Glass is butted with double cross gutters inserted to convey condensation. The glass member is entirely segregated from gutter member to prevent conduction of cold and sweating. Lower member absolutely prevents "cross gutter drip."

Glass—Generally ¼-in. wire glass is loose bedded on a cushion of felt. Since the glass rests on a structural member, the glass bed is true and uniform, which prevents the glass from lying "in wind"—a common cause of breakage. Glass generally is 24 in. wide by approximately 48 in. long.

Double Glazing—Duratite skylights are also furnished double glazed where required.

Painting—All steel portions are coated with Vanco Compound to resist corrosion. Additional painting may be added for color finish. The bars are readily accessible for re-painting.

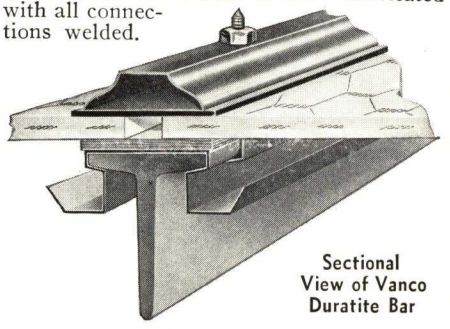
Plating—Steel portions may be treated with a range of protective media, Ship-galvanizing, Parkerizing, Ternizing (a terne coating of tin and lead) and Cadmium-plating.



Sectional Views of Duratite Skylight

Truss Bars (Patented)

Duratite Skylights are trussed for large spans—each bar forms a truss fabricated with all connections welded.



Sectional View of Vanco Duratite Bar

Prominent Installations

Labor and Interstate Commerce Buildings, Washington, D. C., Arthur Brown, Jr., Architect. *Ternized Steel Bars, Copper Trim.*

West Virginia State Capitol, Charleston, W. Va., Cass Gilbert, Architect. *Bronze Bars, Leadcoated Copper Trim.*

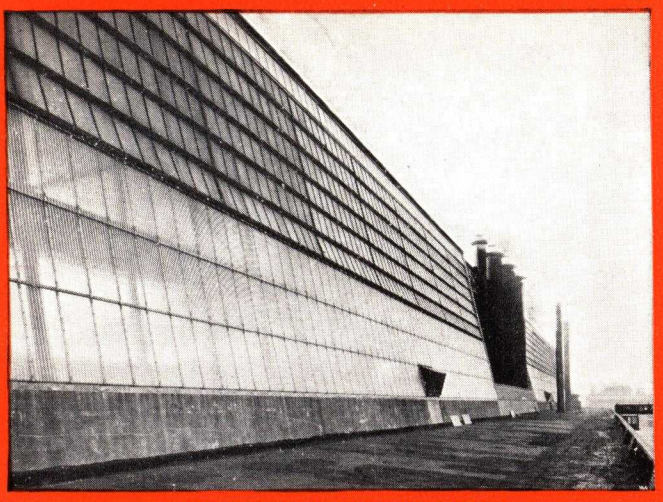
Exhibition Bldgs., National Zoological Park, Washington, D. C., Double *Glazed Skylights, Steel Bars, Copper and Aluminum Trim.*

Worcester Art Museum, Worcester, Mass., Wm. T. Aldrich, Architect. *Ternized Steel Bars. Aluminum Trim.*

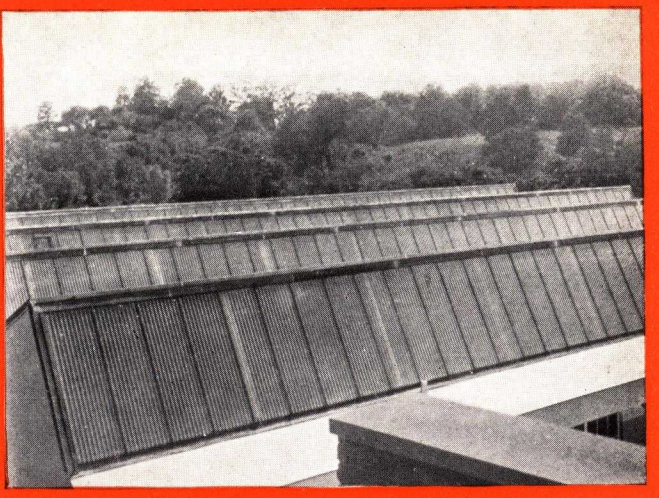
Art Museum, Boston, Mass., Guy Lowell and Wm. T. Aldrich, Architects. *Steel Bars, Copper and Leadcoated Copper Trim.*

Oregon State Capital, Salem, Ore., Trowbridge and Livingston, Architects. *Galvanized Steel Bars, Lead Coated Copper Trim.*

Indoor Athletic Field, Wesleyan University, Middletown, Conn., McKim, Mead & White, Architects. *Steel Bars, Copper Trim.*



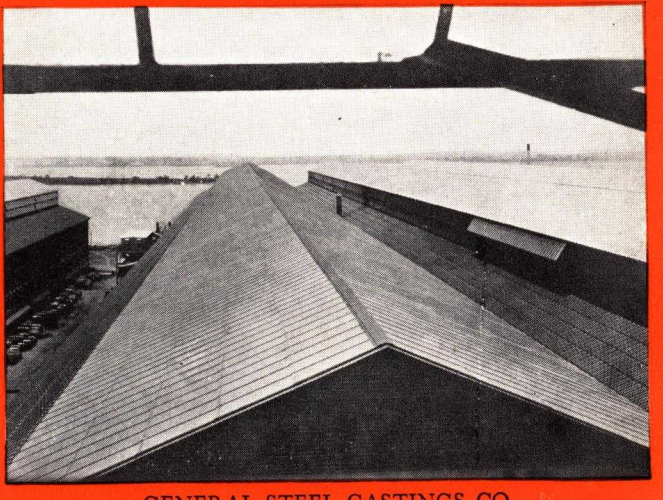
PHILADELPHIA NAVY YARD
FOUNDRY BUILDING
21,000 sq. ft. Side Wall Construction



PERFECT CIRCLE PISTON RING CO.
HAGERSTOWN, INDIANA
7,500 sq. ft. C. W. G. Sawtooth Construction

ORIGINAL SOLID
CORRUGATED WIRE GLASS
SKYLIGHTS, SAWTOOTH AND SIDE WALL CONSTRUCTION

SLUDGE BEDS
BURLINGTON, N. J.
All C. W. G. Buildings



GENERAL STEEL CASTINGS CO.
EDDYSTONE, PA.
323,000 sq. ft. Monitor Roofs

PENNSYLVANIA WIRE GLASS COMPANY
1612 MARKET STREET
PHILADELPHIA, PA.

ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS

Corrugated Wire Glass (CWG) is a corrugated sheet of glass with wire netting incorporated in it during the process of manufacture. Owing to the corrugations it has strength many times greater than any flat glass of equal thickness. To meet the demand for a strong, substantial skylight CWG was adopted to this use by the PENNSYLVANIA WIRE GLASS COMPANY which has specialized in this form of construction for many years.

CWG Skylights can be placed on a roof of any material, including corrugated iron and corrugated asbestos. CWG can be used for roofs, sidewalls, marquises, canopies and, in fact, wherever *daylight* is desired.

CWG Skylights offer many points of superiority. Low maintenance costs are an important item. There are no bars to rust or corrode. No supplementary frame is used as they are applied directly on steel or wood purlins or curbs, and concrete. They have unusual resistance to vibration and temperature changes and are completely weathertight.

Because of the corrugations, rain washes off dirt and dust, making these skylights practically self-cleaning. Being translucent they transmit diffused light with a minimum of shadows.

The Company maintains an engineering service department for consultation regarding skylighting and kindred problems for which there is no charge. Upon receipt of rough sketches or details they will be glad to offer suggestions for CWG Skylights, roofs, etc. Samples of any type of glass manufactured will gladly be mailed on request. For data on Flat Wire Glass and Actinic Glass refer to catalog in the Glass Section of Sweet's File. See File Index.

INDEX TO DETAILS

Plate No.	
P-100	Isometric Detail of Typical Lap Joint.
P-101	Gable End Skylights with Steel Framing.
P-102	Single Pitch Skylights with Steel Framing.
P-103	Concrete Curb Skylights.
P-104	Concrete Curb Skylights.
P-105	Skylights on Wood Sheathed Roof.
P-106	Wood Curb Skylights.
P-107	Skylights with Cement-tile Roofing.
P-108	Skylights with Steel-deck Roofing.
P-109	Sawtooth Skylights with Steel Framing.
P-110	Sawtooth Skylights with Steel Framing.
P-111	Sawtooth Skylights with Wood Framing.
P-112	Skylights on Back Slopes of Sawtooth Framing.
P-113	Skylights with Corrugated Sheet Metal Roofing.
P-114	Steel Framed Marquise.
P-115	Typical Sheet Metal Ventilator Details.
P-116	Methods of Draining Condensation.
P-117	Steel Framed Canopies.
P-118	Details of Sawtooth, Top-Hung, Operated Sash and Fixed Glass
P-119	Details of Windows, Pivoted Sash and Fixed Glass
*P-120	to P-124 inclusive.
2700	Typical CWG Skylights with corrugated asbestos.
2700A	Details of CWG with 2½ in. and 2⅝ in. pitch corrugated asbestos.
2700B	Details of CWG with 4.2 in. pitch corrugated asbestos.
2825A	Standard 10 ft. 0 in. wide Curb Skylight—Steel Frame.
3551	Details of CWG Ventilating Units.
3606	Sludge Bed Details.
3606A	Sludge Bed Details.

*These sheets will be sent out as they are issued.

SPECIFICATIONS FOR THE INSTALLATION OF ORIGINAL SOLID CORRUGATED WIRE GLASS

SCOPE OF WORK

I. Work by Others—

All supporting frames, curbs, purlins, ridge-beams, tie-rods and bracing for proper construction shall be provided under another contract.

All roofing, curb and roof flashings, gutters and counter-flashings shall be provided under another contract.

II. Work Required—

The work to be done under this contract includes the furnishing of all labor, materials, equipment and services necessary for, and reasonably incidental to, the erection of (White or Actinic—specify which) Corrugated Wire Glass ⅜" thick (in Skylights, Sawteeth or Side-Wall Panels), as manufactured by the PENNSYLVANIA WIRE GLASS COMPANY with standard fittings of (specify **which**) No. 3S¾H Aluminum (.032 in. thick), 18-oz. cold rolled copper, 24-gauge galvanized steel (copper bearing) (painted with aluminum), 13-gauge zinc, 24-gauge "Lead Clad" steel, 6-lb. hard lead, as shown on the drawings and herein specified.

SHOP DRAWINGS

This Contractor shall furnish the (Architects, Engineers, Purchasers), for their approval before any of the work is executed, complete shop drawings conforming to the recommendations of the manufacturer.

CONSTRUCTION AND ERECTION

This Contractor shall erect the Corrugated Wire Glass exactly as prescribed in the approved drawings and recommendations of the PENNSYLVANIA WIRE GLASS COMPANY.

(While the specification clause above will cover the erection of Corrugated Wire Glass, under the heading of "Notes" below, there are several clauses which may be included where deemed necessary.)

NOTES

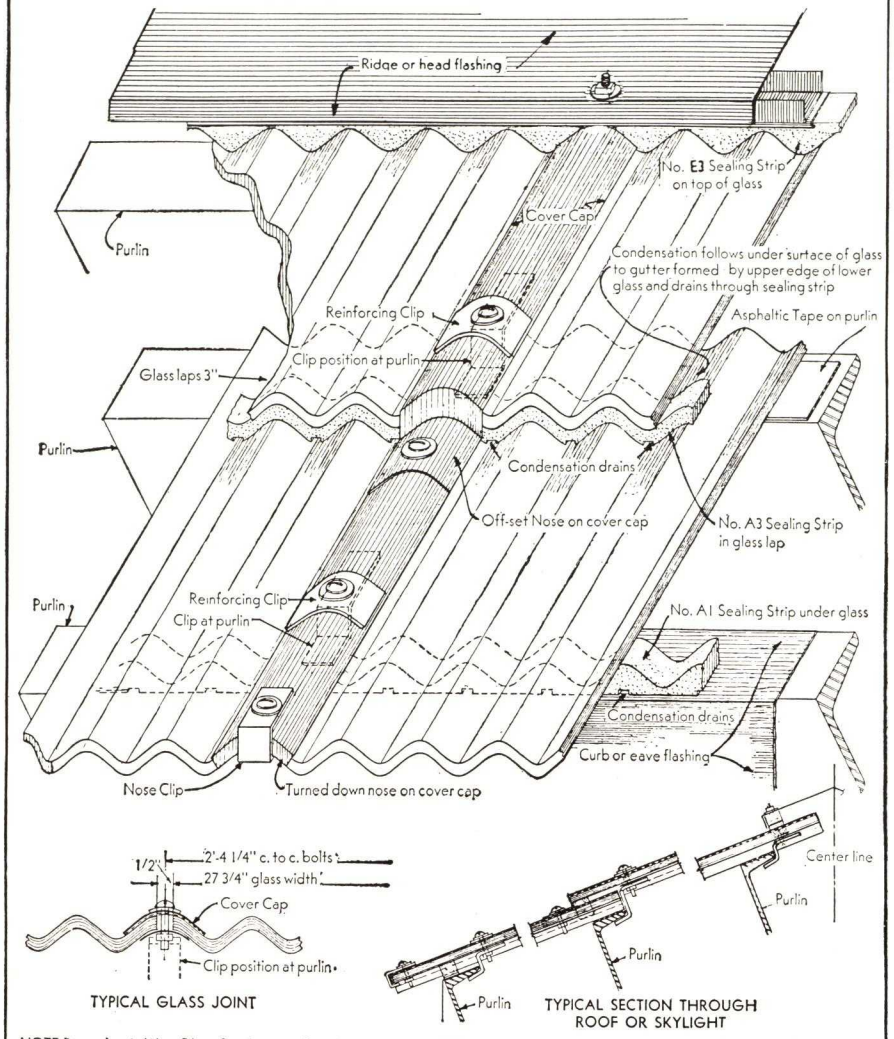
(a) No sheet of Corrugated Wire Glass shall exceed 27¾ in. in width, and, no single sheet shall span more than 60 in. clear opening (up the slope) without an intermediate support. Where glass is set at an angle of 60 degrees, or more, from the horizontal, the maximum clear span may extend to 96 in. (up the slope). Corrugated Wire Glass covering openings greater than those mentioned must have an intermediate support or arrangements must be made to use two or more lights of glass.

(b) The sheets of glass shall be laid edge to edge (not lapping) with ½-in. spaces between the sheets and the open joints so formed shall be covered with exterior metal cover caps and metal inner strips which conform to the corrugations of the glass. The exterior cover caps shall have an asphaltic lining. The caps and inner strips, to complete the joint, shall be bolted together by bolts passing through the caps and inner strips and between the sheets of glass approximately 9 in. center to center.

(c) Where structural supports occur, clips, engaged by bolts passing through the cover caps, shall be used to hold the glass securely in place.

(d) Each light of glass shall have a firm, even bearing and wherever any sheet of glass is applied to structural work (such as curbs, purlins, etc.), it shall be cushioned with an asphalt strip. Where it laps over other glass, it shall be cushioned with a sealing strip.

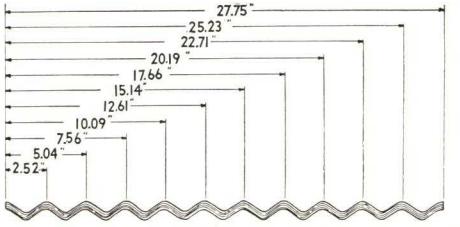
At the bottom (or eaves) of Corrugated Wire Glass construction and at the top (in conjunction with the ridge or flashings), the openings caused by the corrugations of the glass shall be filled with a sealing strip especially designed and supplied for this purpose.



NOTE-Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing The size of curbs, purlins ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building Glass must not have less than 2" bearing at any support All bolts and screws to be 1/4" in diameter

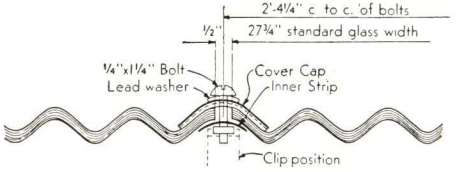
SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS ISOMETRIC DETAIL OF TYPICAL LAP JOINT	PLATE NUMBER P-100 Sept. 1937

STANDARD SIZE AND SPACING FOR ORIGINAL SOLID CORRUGATED WIRE GLASS



STANDARD SHEET OF CORRUGATED WIRE GLASS

THICKNESS—3/8"



TYPICAL COVER CAP JOINT

NOTES

Standard width glass (27¾ in.) should be used wherever possible on account of ease in setting and because cut sizes are more difficult to obtain in case of breakage.

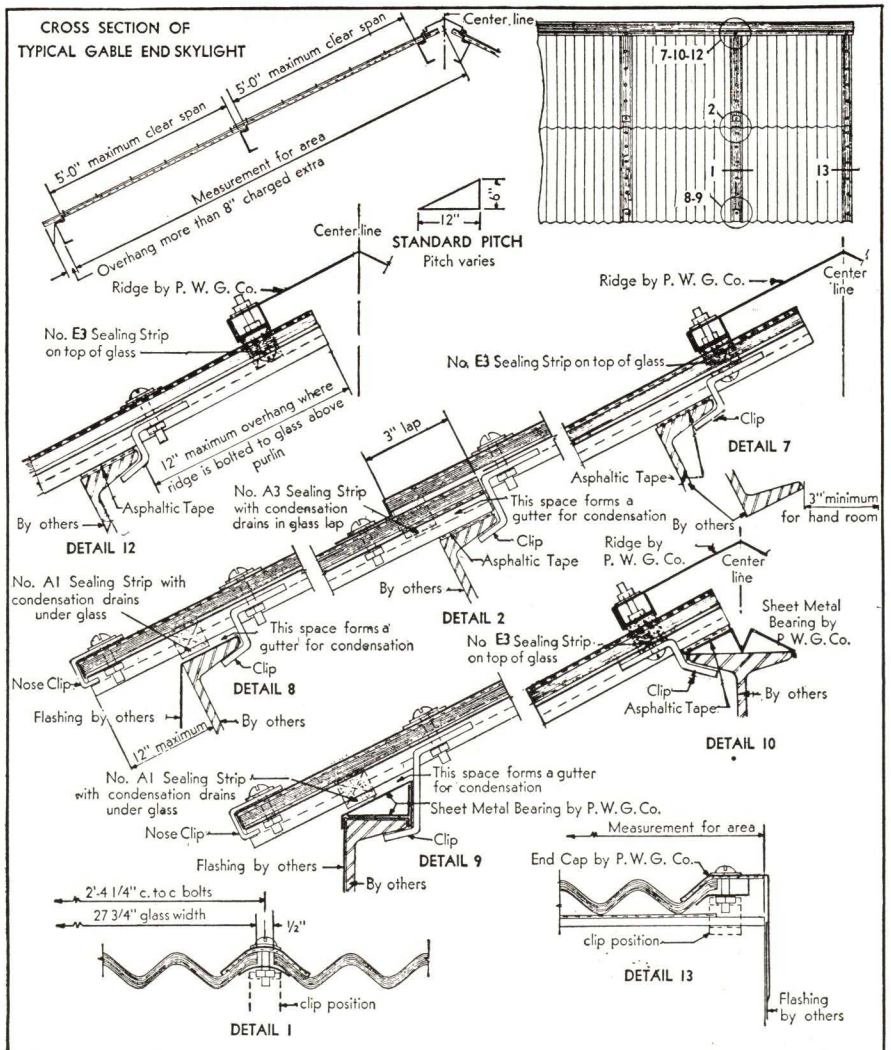
When glass must be cut in widths narrower than 27¾ in. it can only be supplied in multiples of the full corrugation or 2½ in.—viz., 25¼ in., 22¾ in., 20¼ in. and 17¾ in.

In arranging corrugated wire glass sheets to suit a given opening it is often necessary to cut out more than one 2½-in. corrugation. Then it is advisable to divide the cutting among several sheets rather than cut all from one sheet.

Glass more than 27¾ in. wide cannot be supplied.

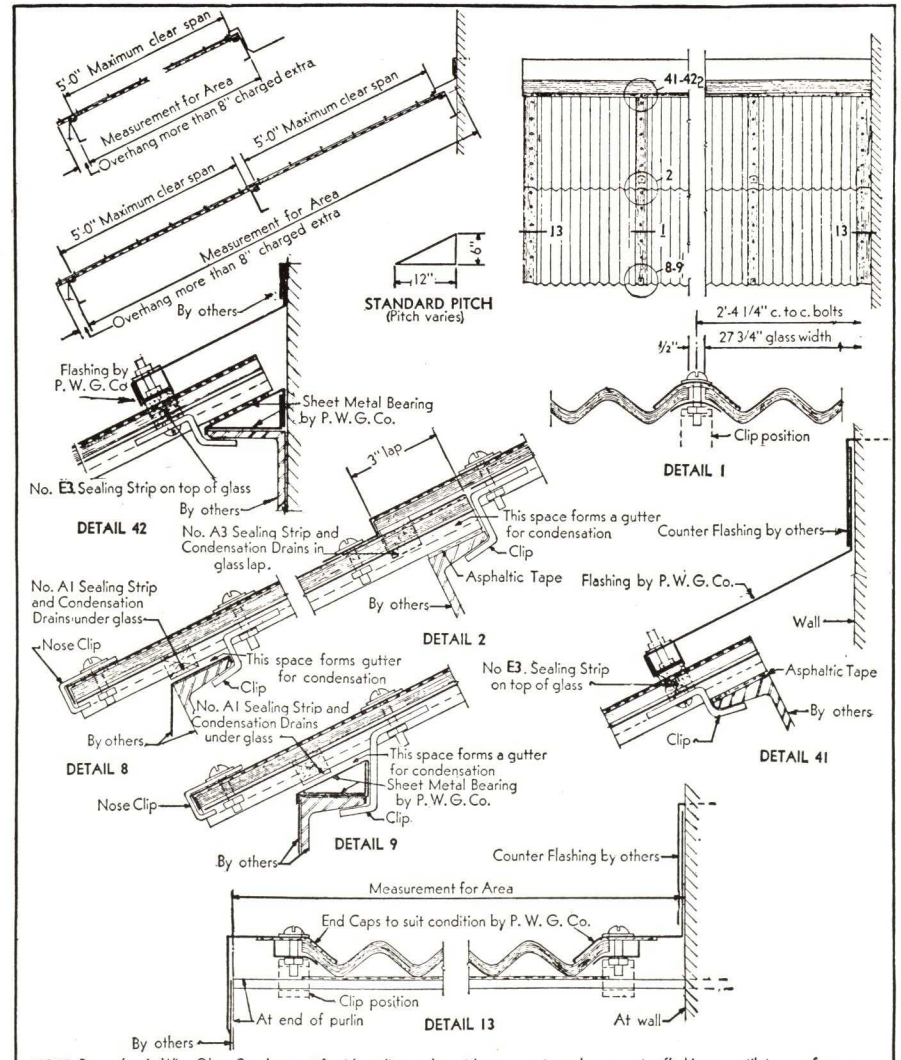
The lengths of the sheets depend upon the conditions under which the glass is used. The conditions governing are shown in the Typical Detail Sheets for different types of skylights and glass roof construction.

DEEP ANGLE			
Lts.	Width	Lts.	Width
1	2′- 4¼″	51	120′- 0¾″
2	4′- 8½″	52	122′- 5″
3	7′- 0¾″	53	124′- 9¼″
4	9′- 5″	54	127′- 1½″
5	11′- 9¼″	55	129′- 5¾″
6	14′- 1½″	56	131′-10″
7	16′- 5¾″	57	134′- 2¼″
8	18′-10″	58	136′- 6½″
9	21′- 2¼″	59	138′-10¾″
10	23′- 6½″	60	141′- 3″
11	25′-10¾″	61	143′- 7¼″
12	28′- 3″	62	145′-11½″
13	30′- 7¼″	63	148′- 3¾″
14	32′-11½″	64	150′- 8″
15	35′- 3¾″	65	153′- 0¼″
16	37′- 8″	66	155′- 4½″
17	40′- 0¼″	67	157′- 8¾″
18	42′- 4½″	68	160′- 1″
19	44′- 8¾″	69	162′- 5¼″
20	47′- 1″	70	164′- 9½″
21	49′- 5¼″	71	167′- 1¾″
22	51′- 9½″	72	169′- 6″
23	54′- 1¾″	73	171′-10¼″
24	56′- 6″	74	174′- 2½″
25	58′-10¼″	75	176′- 6¾″
26	61′- 2½″	76	178′-11″
27	63′- 6¾″	77	181′- 3¼″
28	65′-11″	78	183′- 7½″
29	68′- 3¼″	79	185′-11¾″
30	70′- 7½″	80	188′- 4″
31	72′-11¾″	81	190′- 8¼″
32	75′- 4″	82	193′- 0½″
33	77′- 8¼″	83	195′- 4¾″
34	80′- 0½″	84	197′- 9″
35	82′- 4¾″	85	200′- 1¼″
36	84′- 9″	86	202′- 5½″
37	87′- 1¼″	87	204′- 9¾″
38	89′- 5½″	88	207′- 2″
39	91′- 9¾″	89	209′- 6¼″
40	94′- 2″	90	211′-10½″
41	96′- 6¼″	91	214′- 2¾″
42	98′-10½″	92	216′- 7″
43	101′- 2¾″	93	218′-11¼″
44	103′- 7″	94	221′- 3½″
45	105′-11¼″	95	223′- 7¾″
46	108′- 3½″	96	226′- 0″
47	110′- 7¾″	97	228′- 4¼″
48	113′- 0″	98	230′- 8½″
49	115′- 4¼″	99	233′- 0¾″
50	117′- 8½″	100	235′- 5″



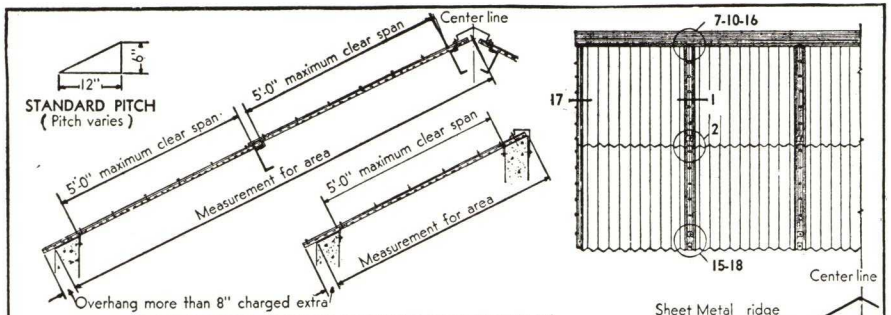
NOTE-Pennsylvania Wire Glass Co. does not furnish, purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH GABLE ENDS AND STEEL FRAMING	PLATE NUMBER P-101 Sept. 1937

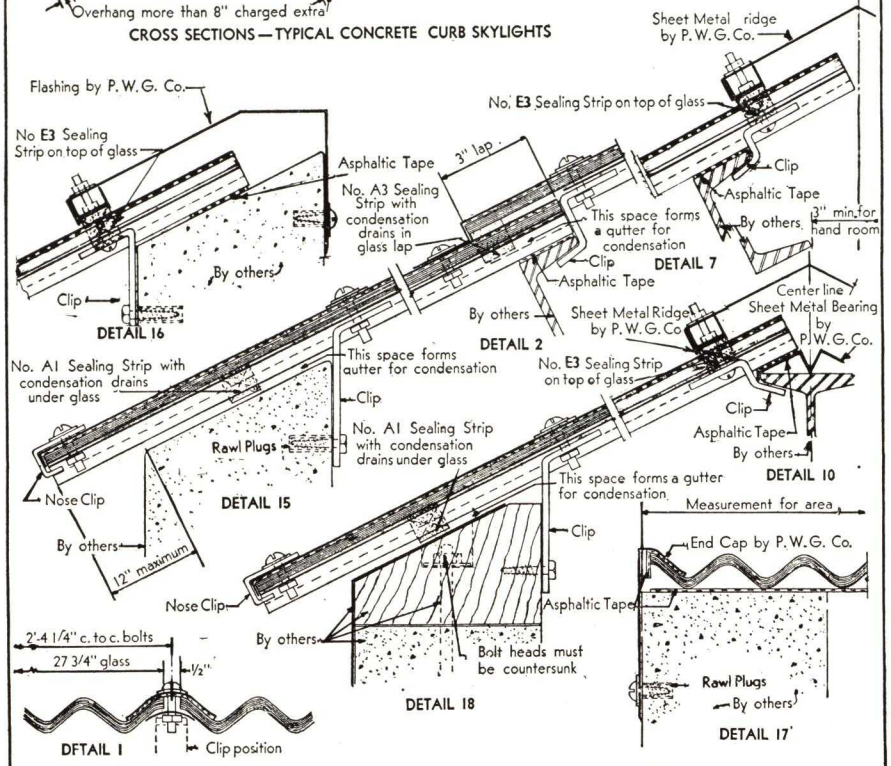


NOTE-Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SINGLE PITCH SKYLIGHTS—STEEL CURB FRAMING	PLATE NUMBER P-102 Sept. 1937

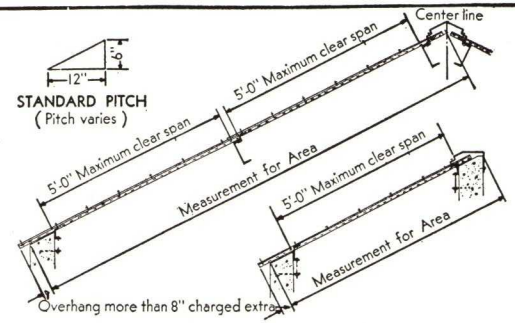


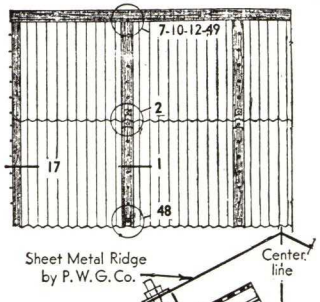
CROSS SECTIONS — TYPICAL CONCRETE CURB SKYLIGHTS

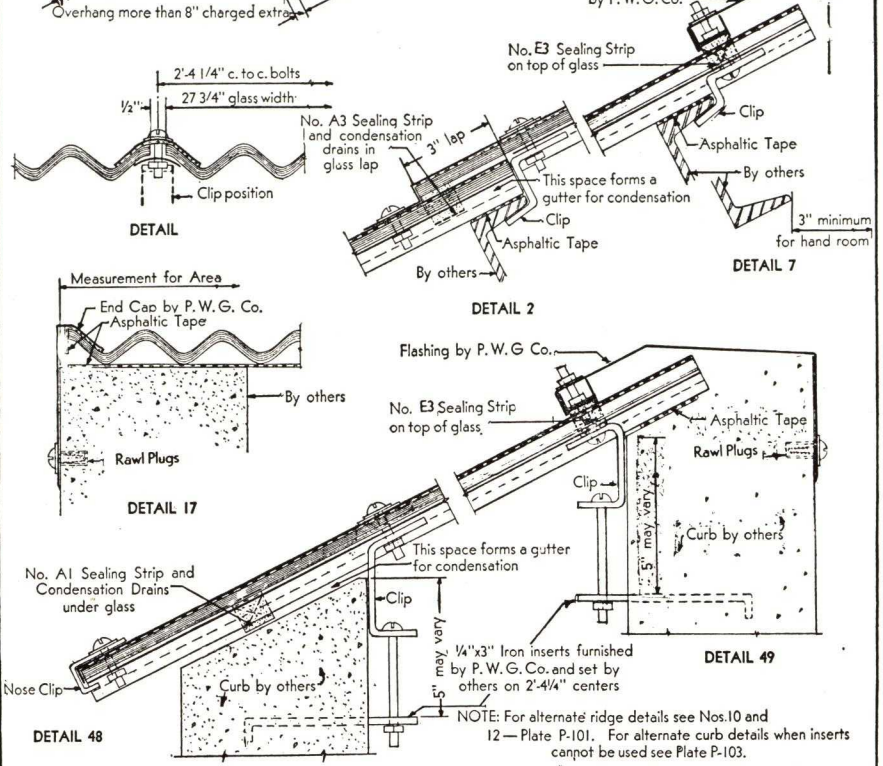


NOTE-Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH CONCRETE CURBS	PLATE NUMBER P-103 Sept 1937



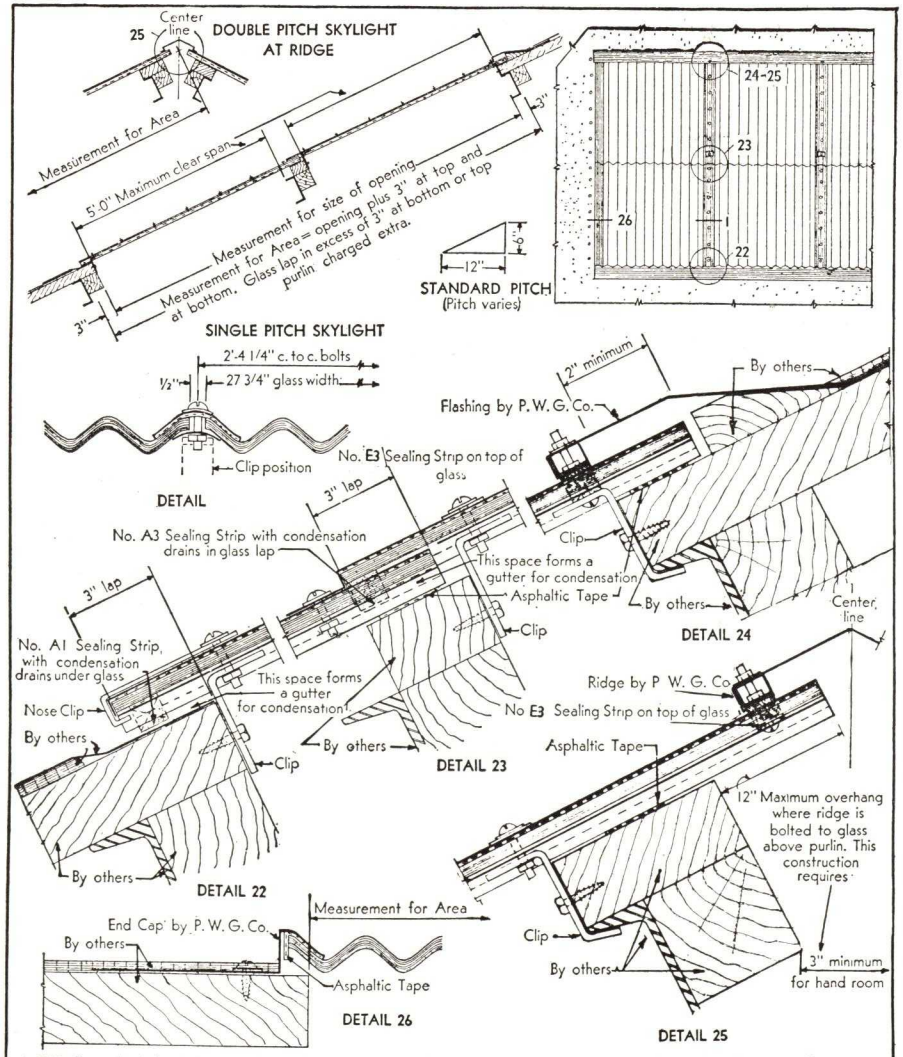




NOTE: For alternate ridge details see Nos. 10 and 12 — Plate P-101. For alternate curb details when inserts cannot be used see Plate P-103.

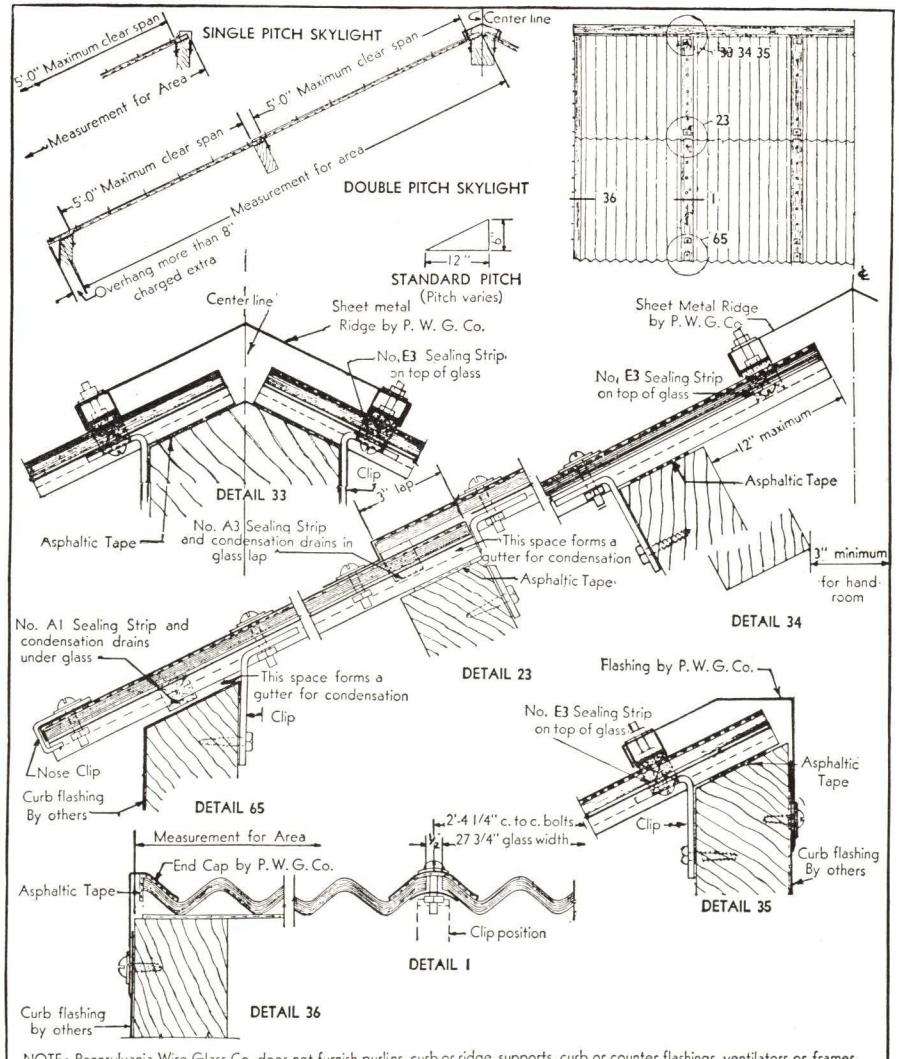
NOTE-Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support All bolts and screws to be 1/4" in diameter

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH CONCRETE CURBS	PLATE NUMBER P-104 Sept. 1937



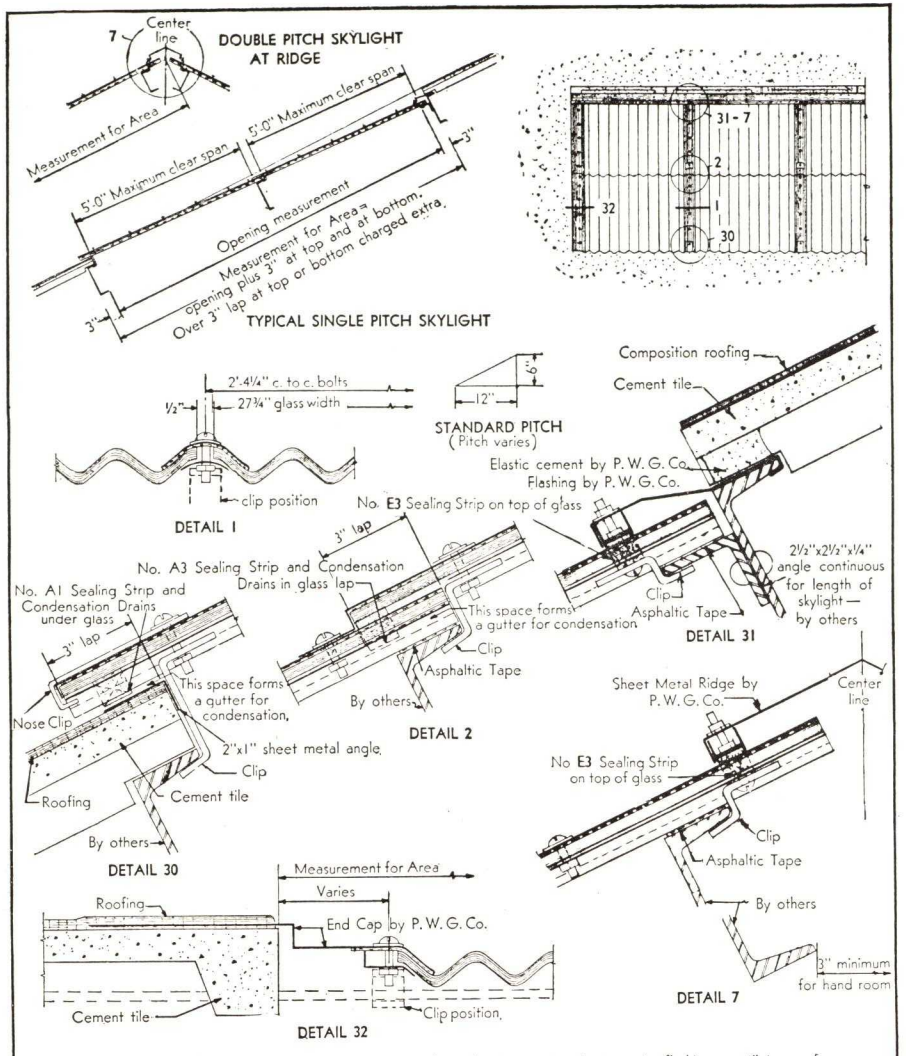
NOTE - Pennsylvania Wire Glass Co. does not furnish, purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS ON WOOD-SHEATHED ROOF	PLATE NUMBER P-105 Sept. 1937



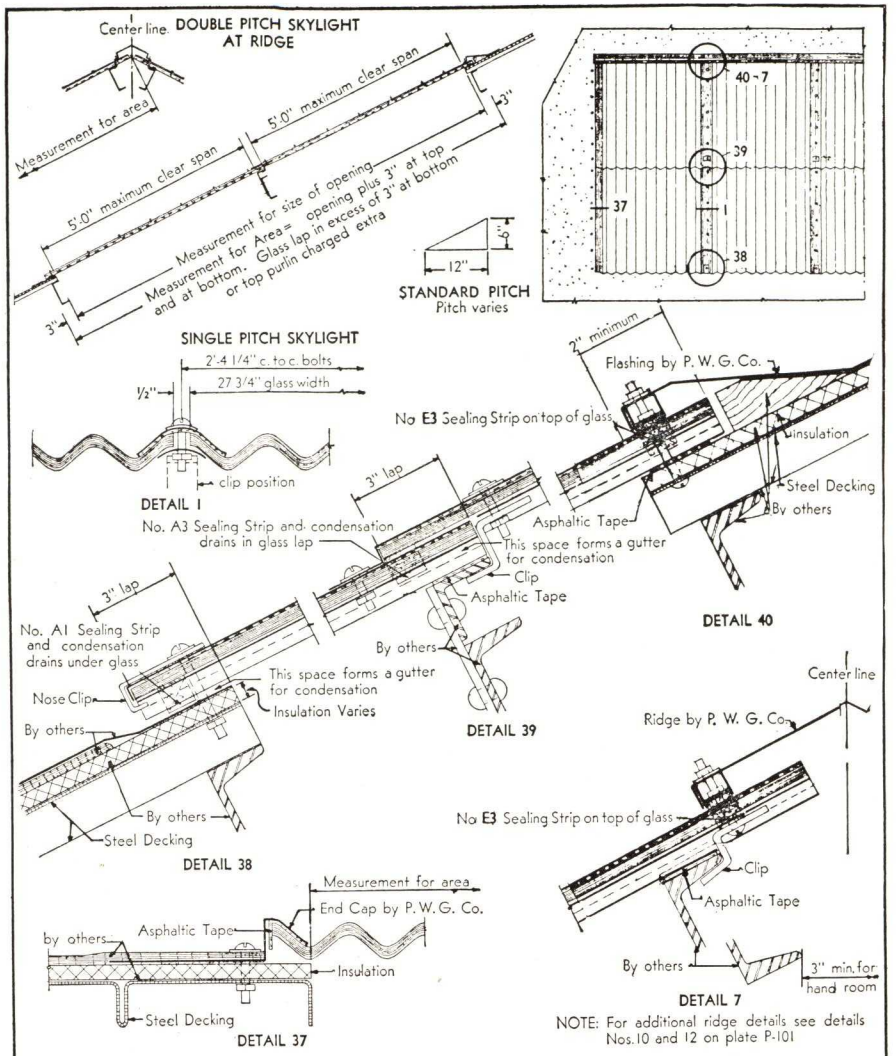
NOTE - Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH WOOD FRAMING	PLATE NUMBER P-106 Sept. 1937



NOTE-Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

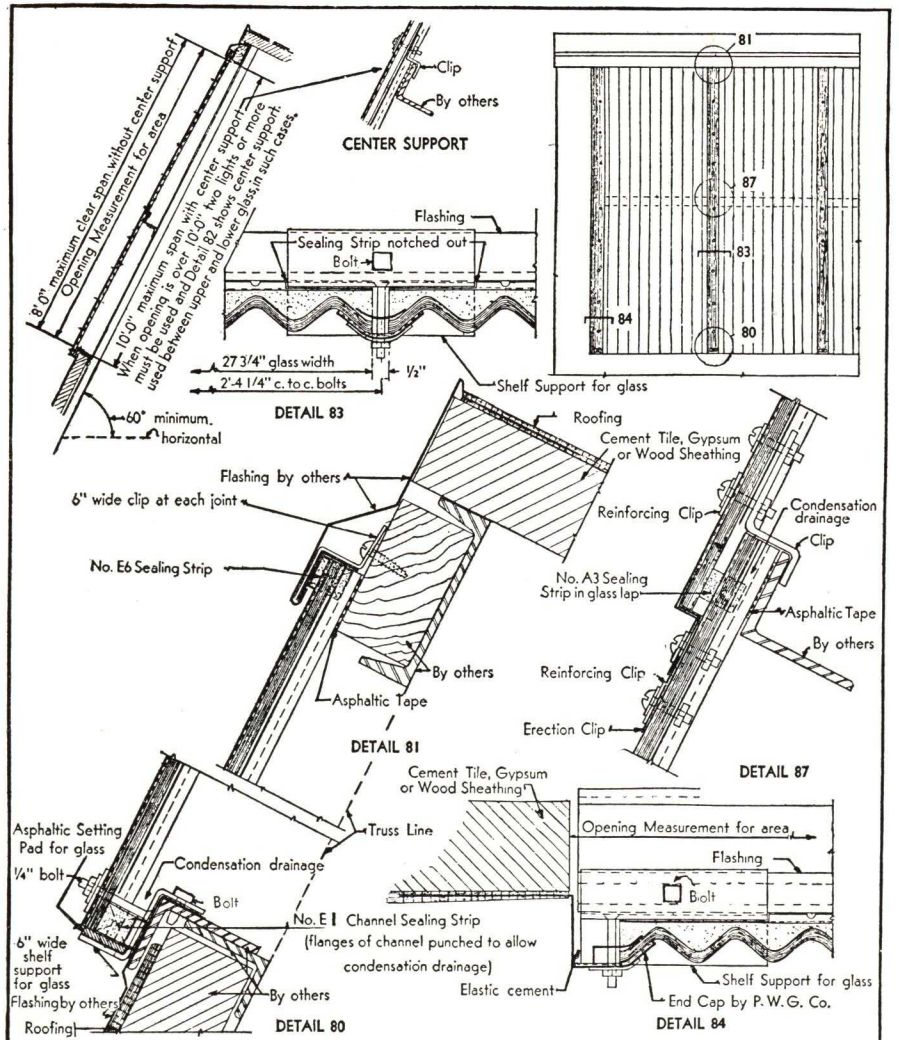
SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH CEMENT TILE ROOFING	PLATE NUMBER P-107 Sept. 1937



NOTE: For additional ridge details see details Nos. 10 and 12 on plate P-101

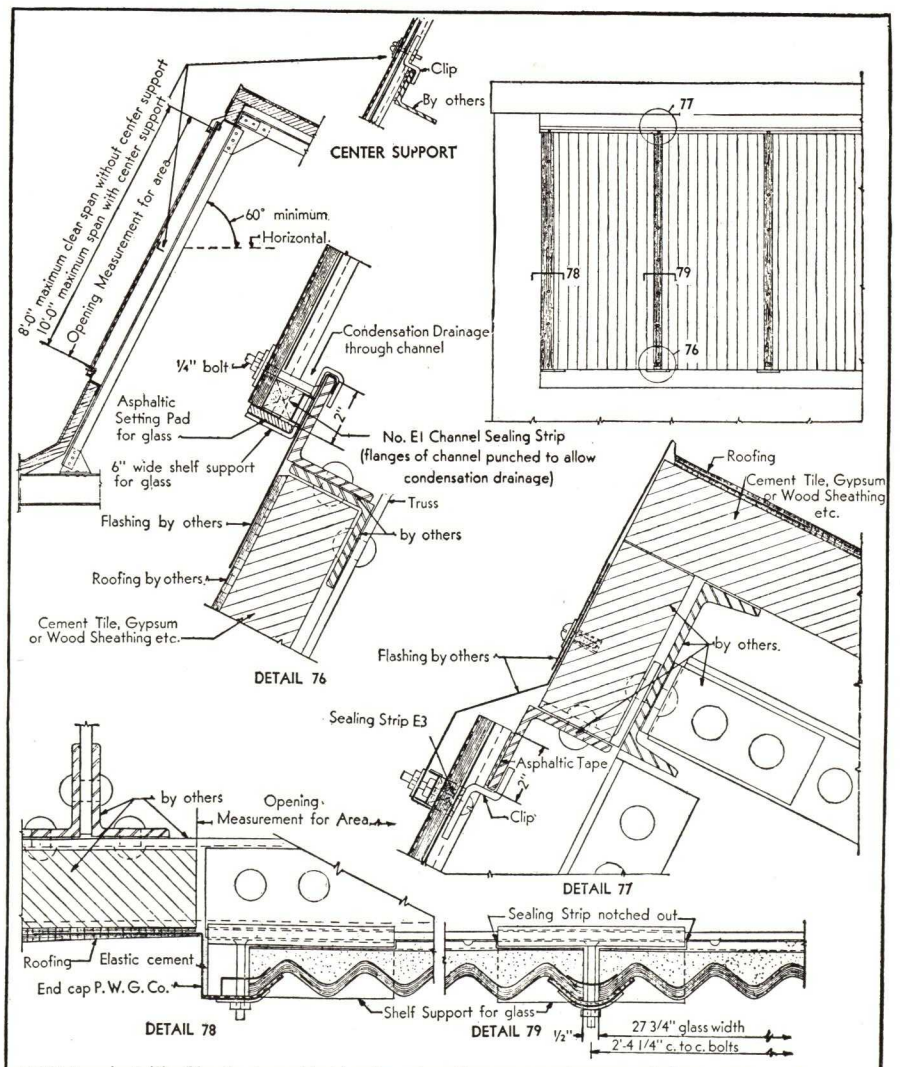
NOTE-Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH STEEL DECK ROOFING	PLATE NUMBER P-108 Sept. 1937



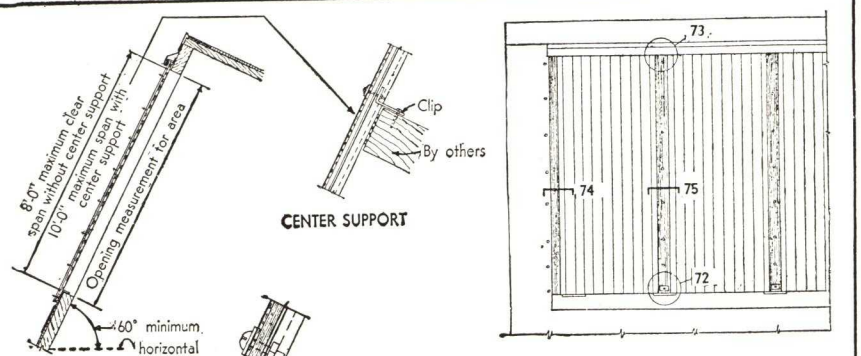
NOTE- Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter

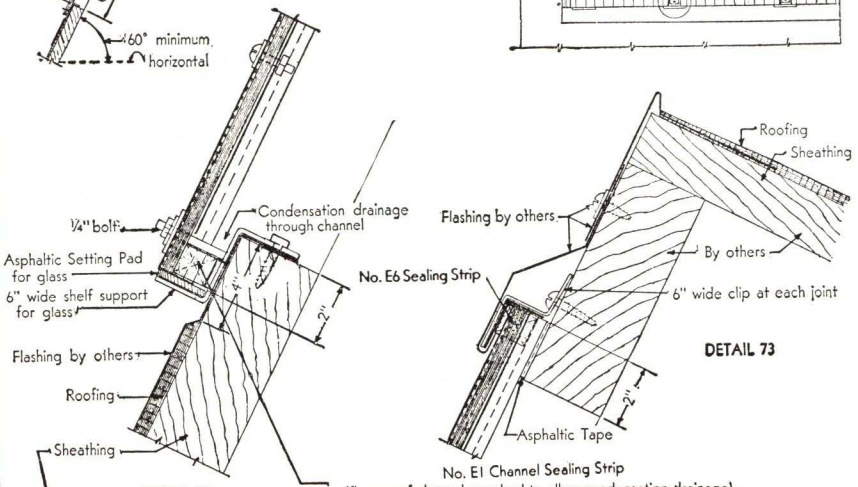
SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH STEEL SAWTOOTH FRAMING	PLATE NUMBER P-109 SEPT. 1937



NOTE- Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The sizes of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be ¼" in diameter.

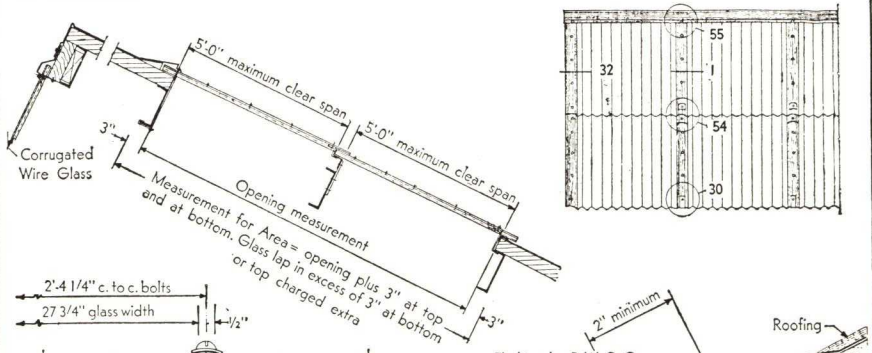
SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH STEEL SAWTOOTH FRAMING	PLATE NUMBER P-110 SEPT. 1937

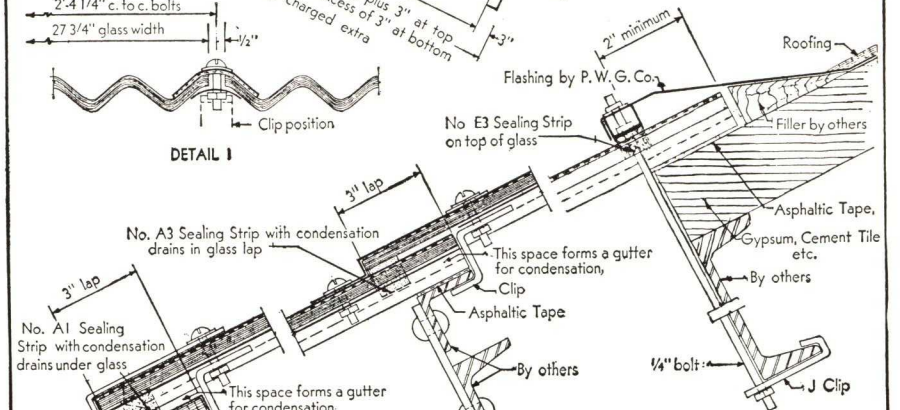




NOTE-Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

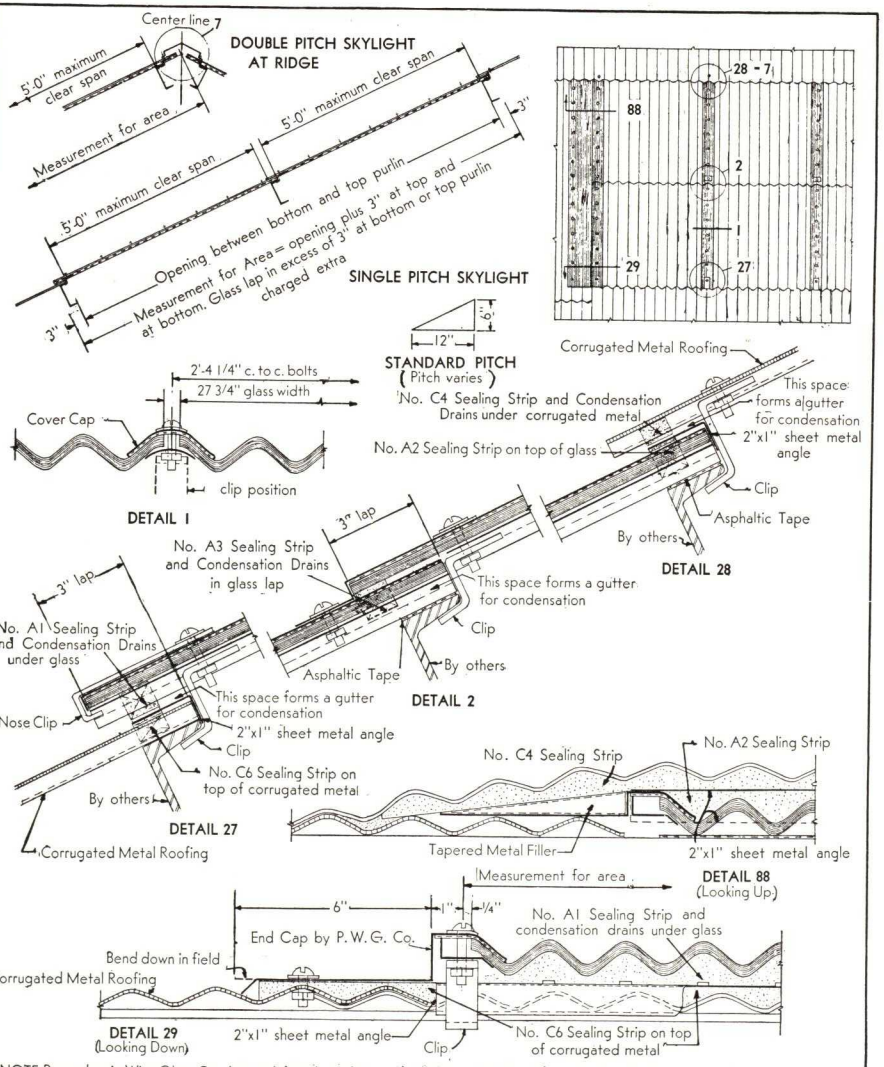
SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH STEEL SAWTOOTH FRAMING	PLATE NUMBER P-111 Sept. 1937





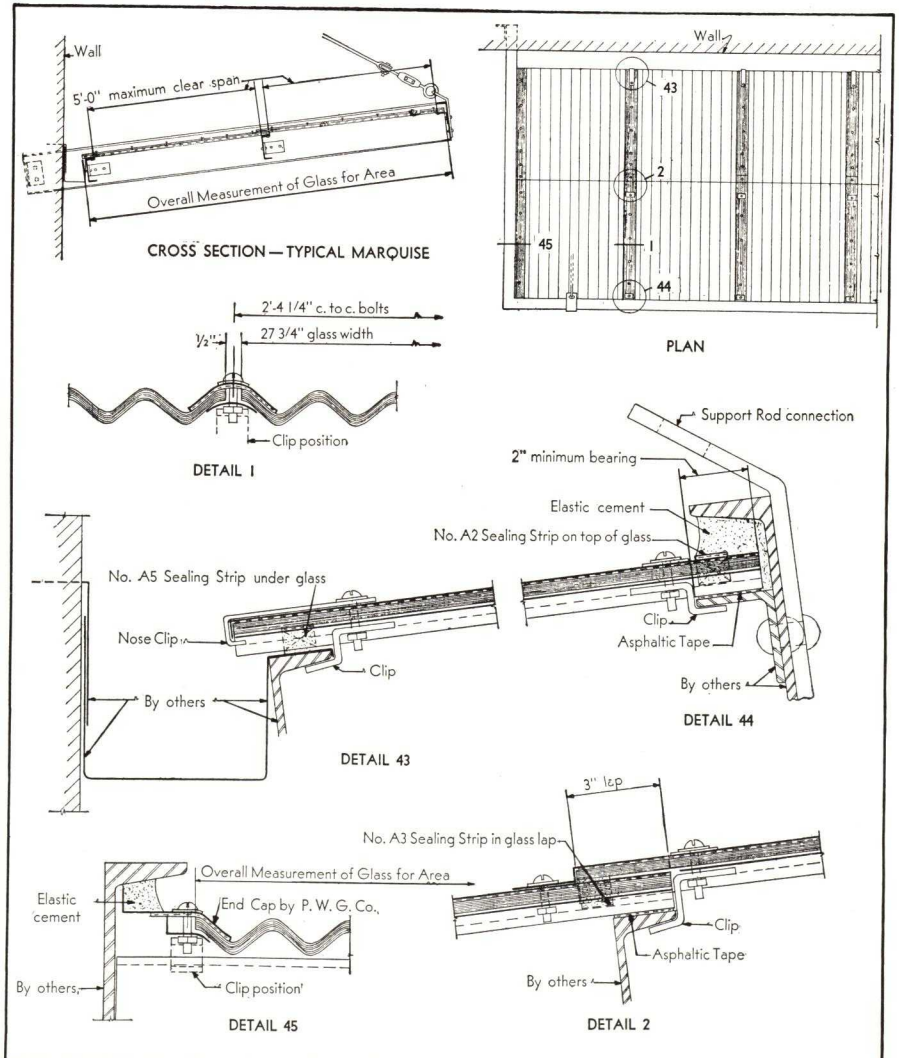
NOTE-Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS USED ON BACK SLOPES OF SAWTOOTHS	PLATE NUMBER P-112 Sept. 1937



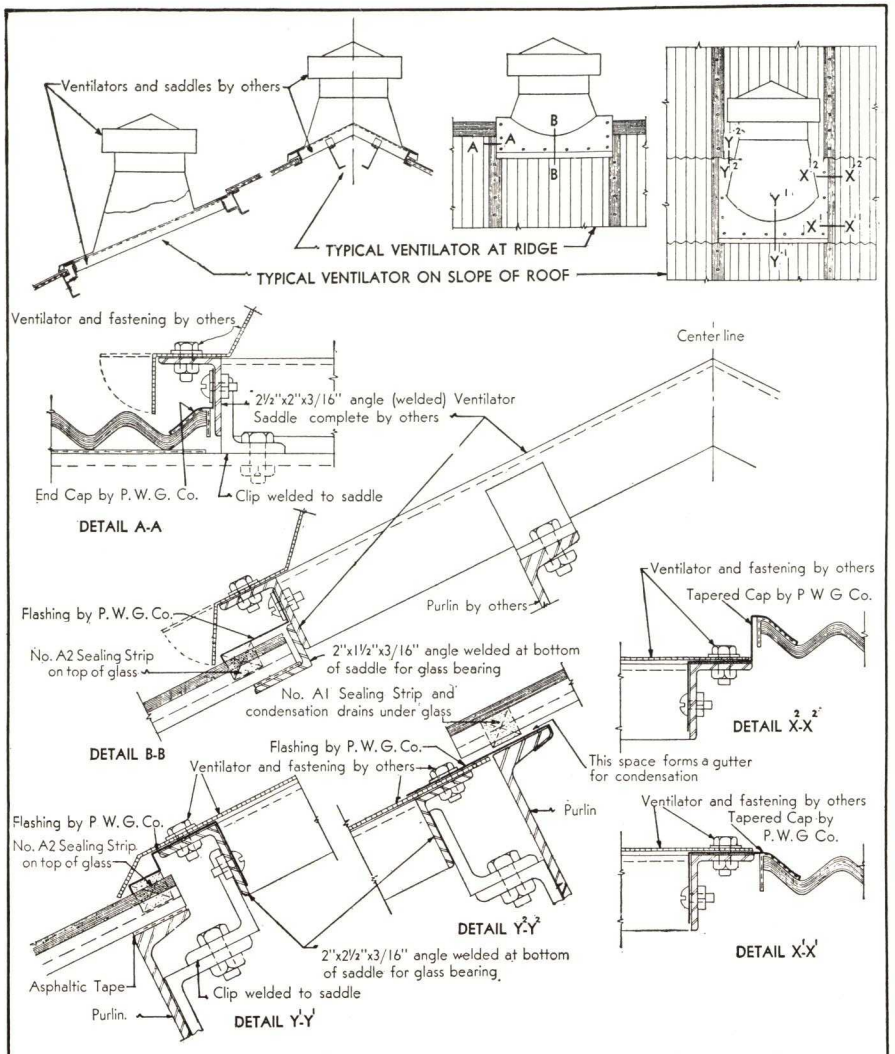
NOTE-Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH CORRUGATED SHEET METAL ROOFING	PLATE NUMBER P-113 Sept. 1937



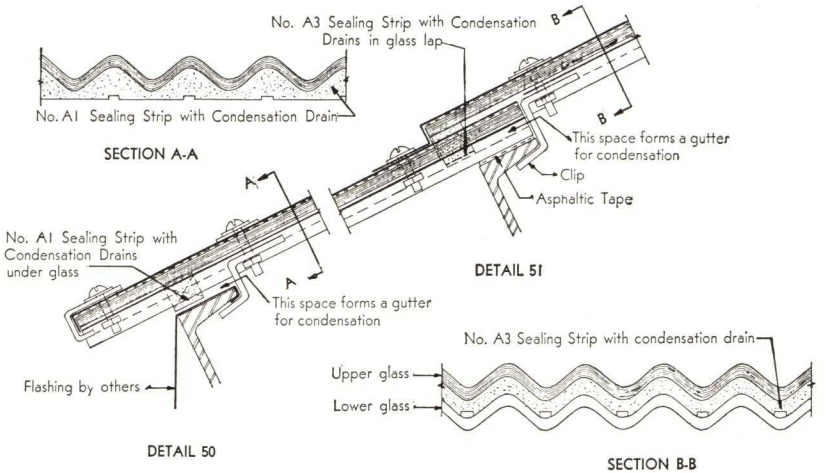
NOTE- Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS WITH STEEL FRAMED MARQUISE	PLATE NUMBER P-114 Sept. 1937

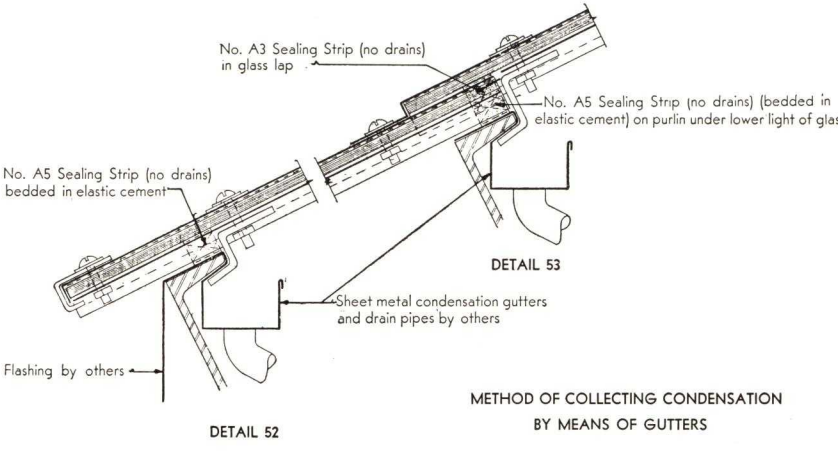


NOTE Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The sizes of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be ¼" in diameter

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS WITH TYPICAL SHEET METAL VENTILATORS	PLATE NUMBER P-115 Sept. 1937



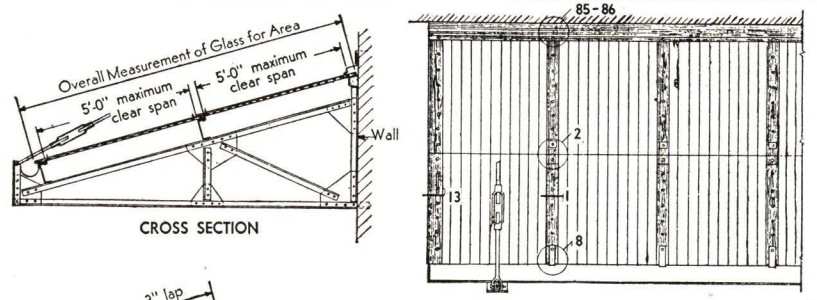
METHOD OF DRAINING CONDENSATION THROUGH CONDENSATION TUBES

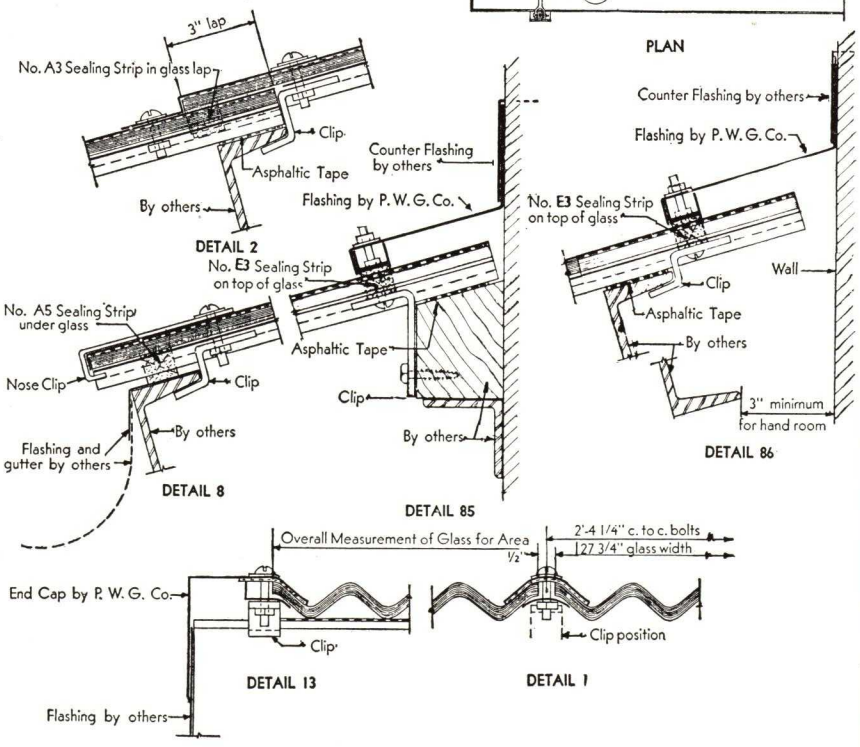


METHOD OF COLLECTING CONDENSATION BY MEANS OF GUTTERS

NOTE- Pennsylvania Wire Glass Co. does not furnish purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter.

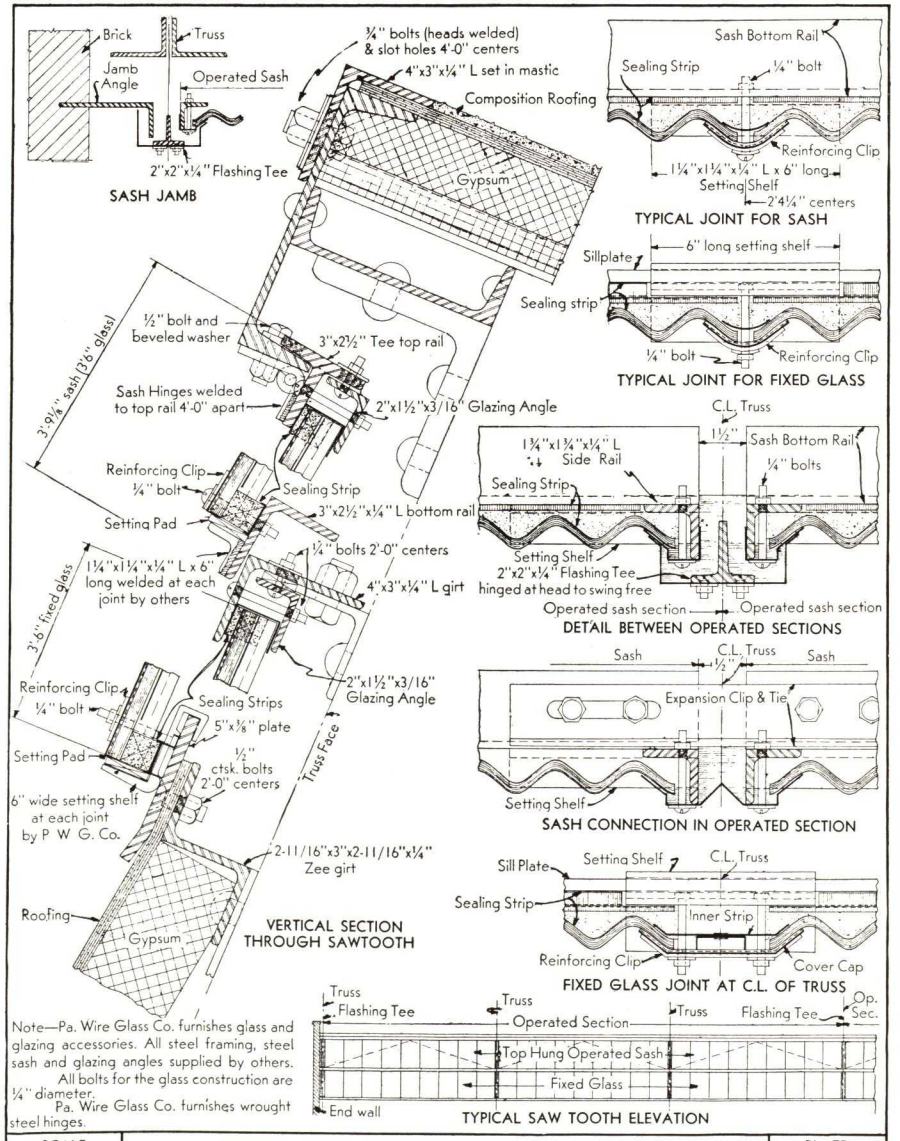
SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SKYLIGHTS METHODS OF DRAINING CONDENSATION	PLATE NUMBER P-116 Sept. 1937





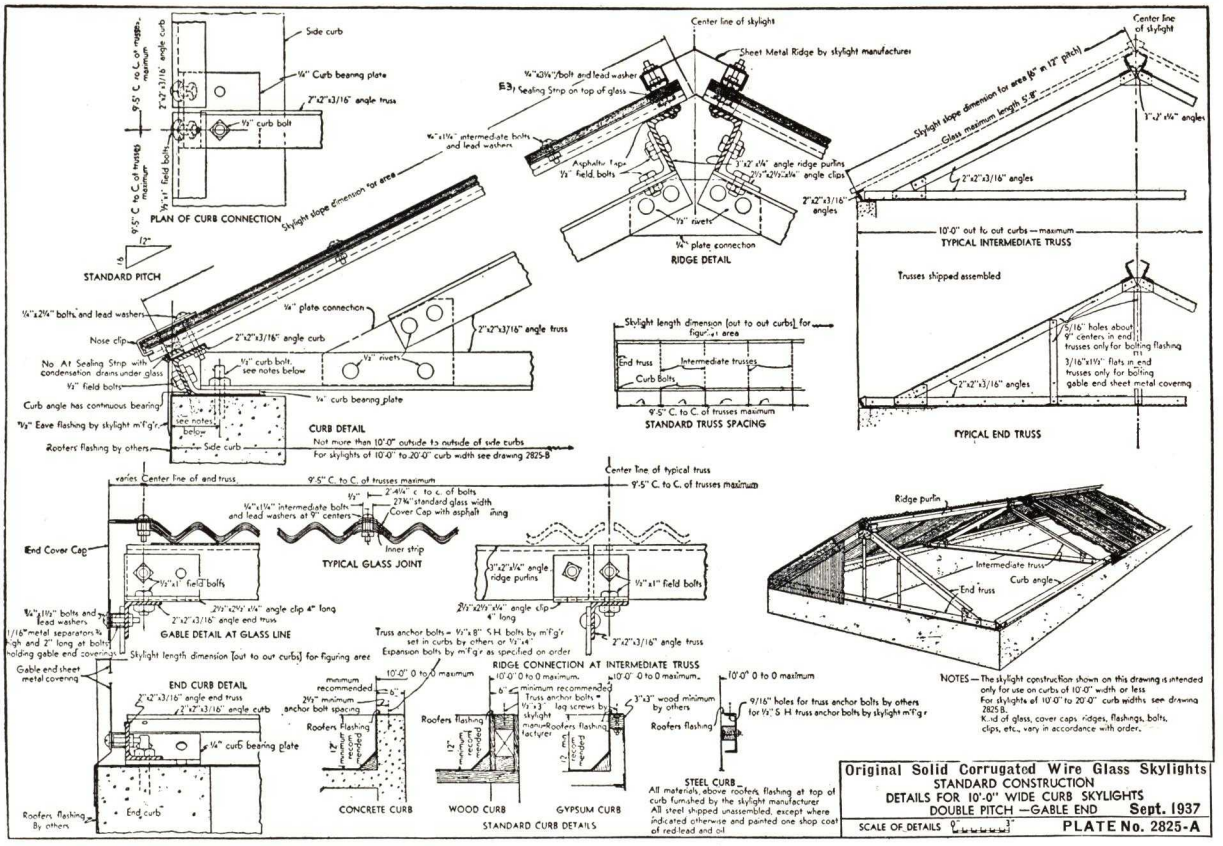
NOTE-Pennsylvania Wire Glass Co. does not furnish, purlins, curb or ridge supports, curb or counter flashings, ventilators or frames. The supporting construction shown on this drawing is of minimum size for satisfactory glass bearing. The size of curbs, purlins, ridge beams, tie-rods and bracing for proper construction must be clearly stated in plans and specifications for the building. Glass must not have less than 2" bearing at any support. All bolts and screws to be 1/4" in diameter

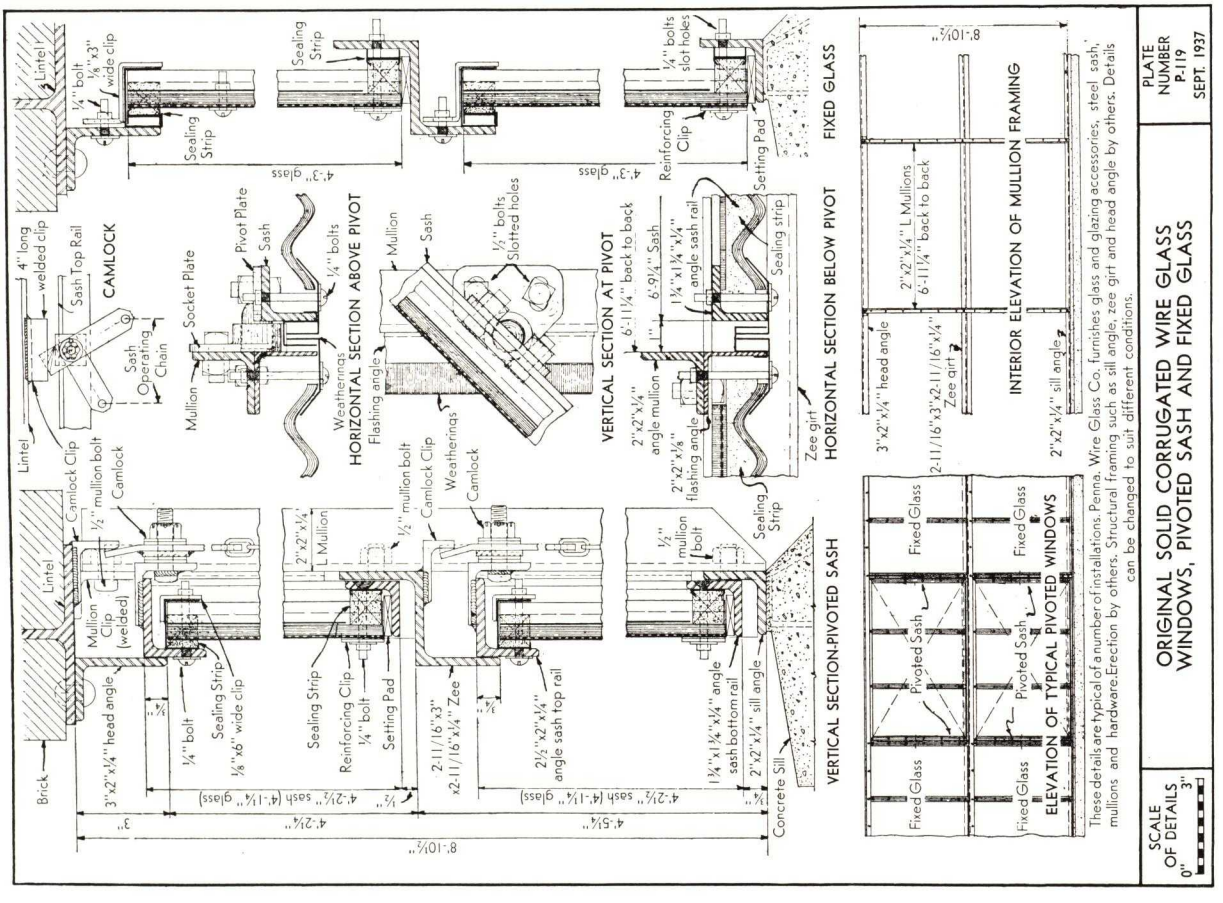
SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS WITH STEEL FRAME CANOPIES	PLATE NUMBER P-117 SEPT. 1937



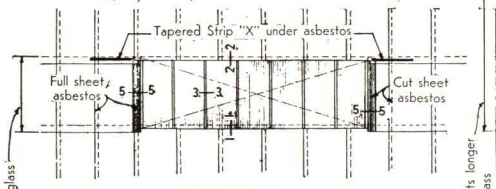
Note—Pa. Wire Glass Co. furnishes glass and glazing accessories. All steel framing, steel sash and glazing angles supplied by others. All bolts for the glass construction are ¼" diameter. Pa. Wire Glass Co. furnishes wrought steel hinges.

SCALE OF DETAILS 0" 3"	ORIGINAL SOLID CORRUGATED WIRE GLASS SAWTOOTH, TOP HUNG, OPERATED SASH AND FIXED GLASS	PLATE NUMBER P118 SEPT. 1937

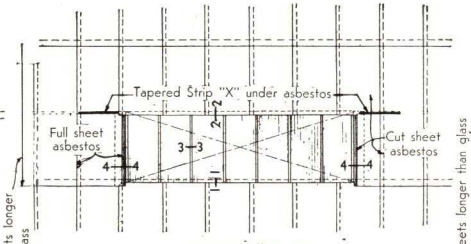

PLAN OF CURB CONNECTION
STANDARD PITCH
CURB DETAIL
RIDGE DETAIL
TYPICAL INTERMEDIATE TRUSS
STANDARD TRUSS SPACING
TYPICAL END TRUSS
TYPICAL GLASS JOINT
GABLE DETAIL AT GLASS LINE
RIDGE CONNECTION AT INTERMEDIATE TRUSS
END CURB DETAIL
CONCRETE CURB
WOOD CURB
GYPSUM CURB
STANDARD CURB DETAILS
STEEL CURB
Trusses shipped assembled
NOTES — The skylight construction shown on this drawing is intended only for use on curbs of 10'-0" width or less
For skylights of 10'-0" to 20'-0" curb widths see drawing 2825 B.
Kind of glass, cover caps, ridges, flashings, bolts, clips, etc., vary in accordance with order.
Original Solid Corrugated Wire Glass Skylights
STANDARD CONSTRUCTION
DETAILS FOR 10'-0" WIDE CURB SKYLIGHTS
DOUBLE PITCH — GABLE END
Sept. 1937
SCALE OF DETAILS 0" 3"
PLATE No. 2825-A


HORIZONTAL SECTION ABOVE PIVOT
VERTICAL SECTION AT PIVOT
HORIZONTAL SECTION BELOW PIVOT FIXED GLASS
VERTICAL SECTION-PIVOTED SASH
INTERIOR ELEVATION OF MULLION FRAMING
ELEVATION OF TYPICAL PIVOTED WINDOWS
CAMLOCK
Fixed Glass
Pivoted Sash
PLATE NUMBER P-119
SEPT. 1937
ORIGINAL SOLID CORRUGATED WIRE GLASS
WINDOWS, PIVOTED SASH AND FIXED GLASS
These details are typical of a number of installations. Penna. Wire Glass Co. furnishes glass and glazing accessories, steel sash, mullions and hardware. Erection by others. Structural framing such as sill angle, zee girt and head angle by others. Details can be changed to suit different conditions.
SCALE OF DETAILS 0" 3"

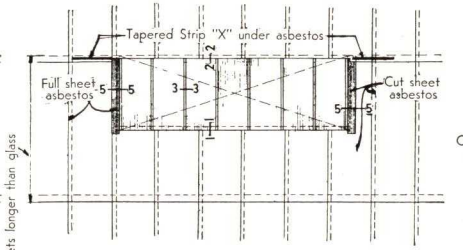
TOP ROW—Shows skylights starting at edge of full sheet of asbestos when skylights are placed at random and have no definite location or relation to trusses, bay centers, etc.



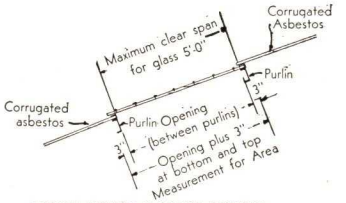
SKYLIGHT TYPE "R"
Asbestos sheets at end of skylight same length as glass



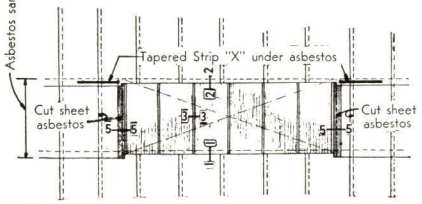
SKYLIGHT TYPE "S"
Asbestos sheets longer than glass and glass placed at bottom

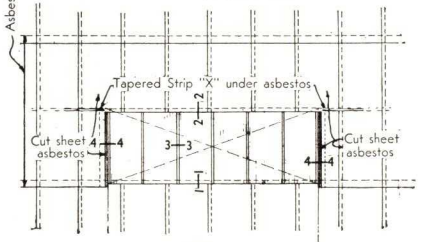


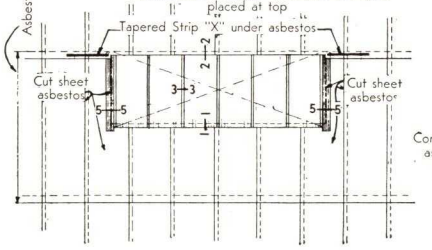
SKYLIGHT TYPE "T"
Asbestos sheets longer than glass and glass placed at top

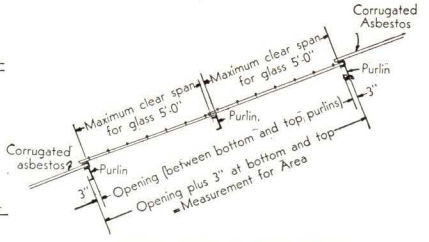


TYPICAL SKYLIGHT CROSS SECTION
One run of glass









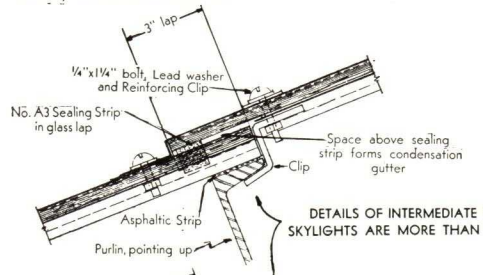
TYPICAL SKYLIGHT CROSS SECTION
More than one run of glass

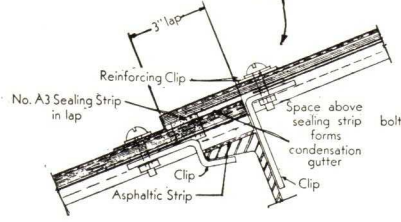
BOTTOM ROW—Shows skylights set in openings cut in asbestos with cut sheets at each end as often happens when skylights must be located definitely with relation to trusses, etc

NOTE
Length (measure for area) of Types R, S and T skylights varies in multiples of 2'-4¼" which is the glass joint spacing for standard 27¾" wide glass

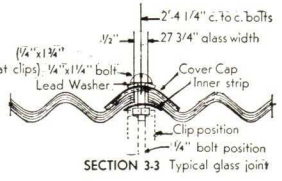
NOTE:
The soft metal wing is made 3" longer than hard metal cap at both bottom and top of skylight

The maximum and minimum spacing of asbestos with relation to the end of skylight (glass) is indicated. These distances apply when the asbestos sheet is cut so as to end either "up" or "down" and permit proper placing of end cover caps



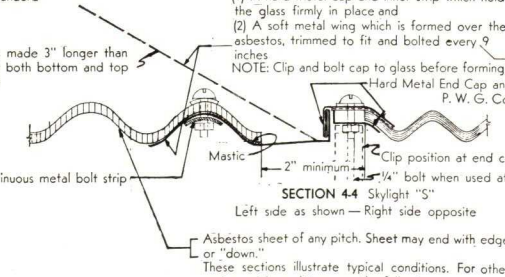


DETAILS OF INTERMEDIATE PURLINS WHERE SKYLIGHTS ARE MORE THAN ONE LIGHT HIGH

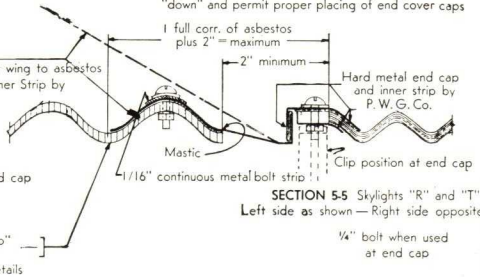


SECTION 3-3 Typical glass joint

The end cap connecting glass and asbestos is formed of two parts, viz.,
(1) A hard metal cap and inner strip which hold the glass firmly in place and
(2) A soft metal wing which is formed over the asbestos, trimmed to fit and bolted every 9 inches
NOTE: Clip and bolt cap to glass before forming soft wing to asbestos



SECTION 4-4 Skylight "S"
Left side as shown — Right side opposite



SECTION 5-5 Skylights "R" and "T"
Left side as shown — Right side opposite

¼" bolt when used at end cap

These sections illustrate typical conditions. For other details and special conditions see the following

DETAIL DRAWINGS

2⅝" pitch asbestos—drawing No. 2700A
4.2" pitch asbestos—drawing No. 2700B
7" pitch asbestos—drawing No. 2700C

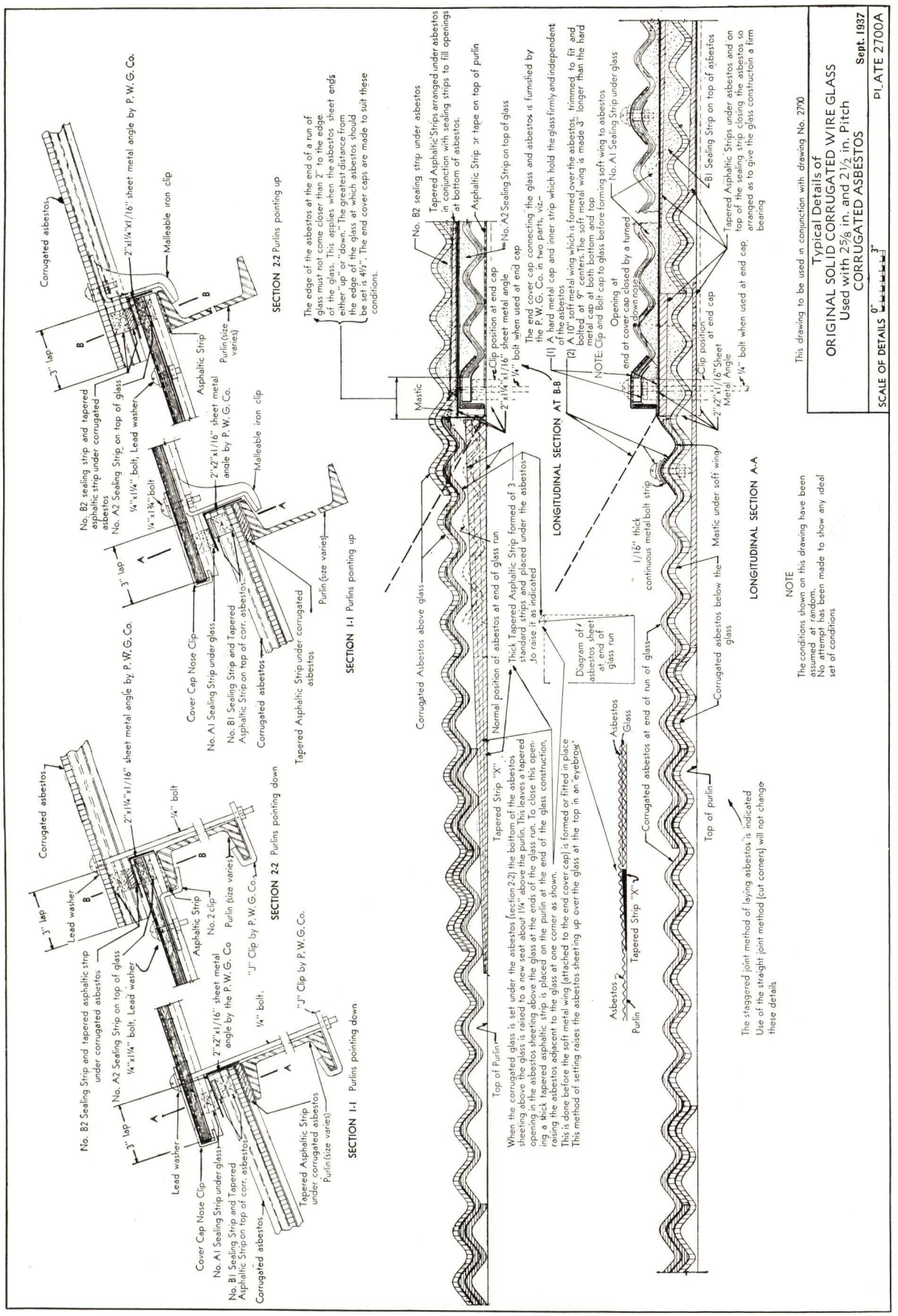
NOTE:
This is a typical plan and detail sheet showing corrugated wire glass with any make of corrugated asbestos roofing. Since the pitch of different asbestos sheets varies, certain details of erection also vary (see list of detail drawings at left)

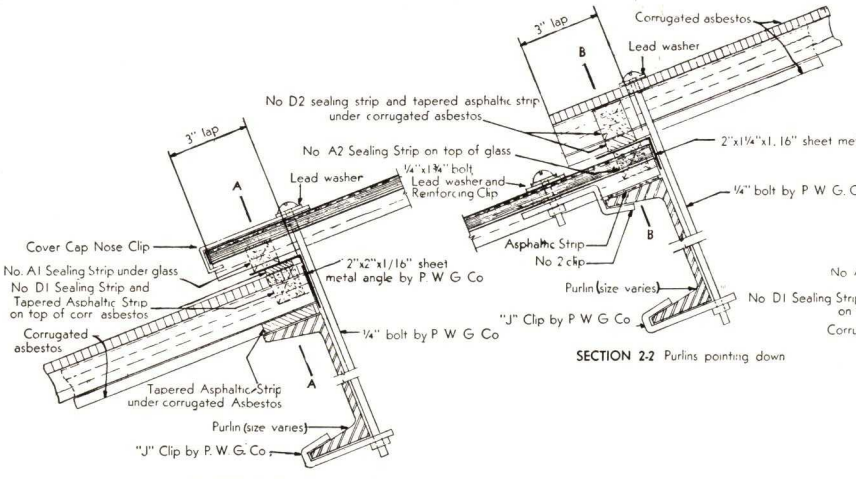
ORIGINAL SOLID CORRUGATED WIRE GLASS USED WITH CORRUGATED ASBESTOS ROOFING

Sept. 1937

SCALE OF DETAILS 0" 3"

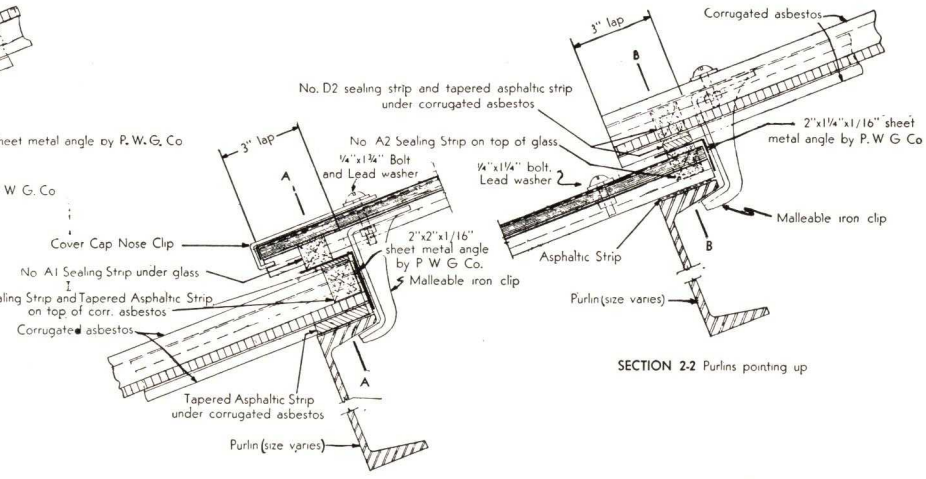
PLATE 2700


Typical Details of
ORIGINAL SOLID CORRUGATED WIRE GLASS
Used with 2⅝ in. and 2½ in. Pitch
CORRUGATED ASBESTOS
Sept. 1937
PLATE 2700A
SCALE OF DETAILS 0" 3"
This drawing to be used in conjunction with drawing No. 2700
SECTION 1-1 Purlins pointing down
SECTION 2-2 Purlins pointing down
SECTION 1-1 Purlins pointing up
SECTION 2-2 Purlins pointing up
LONGITUDINAL SECTION AT B-B
LONGITUDINAL SECTION A-A
NOTE
The conditions shown on this drawing have been assumed at random.
No attempt has been made to show any ideal set of conditions
The staggered joint method of laying asbestos is indicated
Use of the straight joint method (cut corners) will not change these details
The edge of the asbestos at the end of a run of glass must not come closer than 2" to the edge of the glass. This applies when the asbestos sheet ends either "up" or "down." The greatest distance from the edge of the glass at which asbestos should be set is 4½". The end cover caps are made to suit these conditions.
When the corrugated glass is set under the asbestos (section 2-2) the bottom of the asbestos sheeting above the glass is raised to a new seat about 1¼" above the purlin. This leaves a tapered opening in the asbestos sheeting above the glass at the ends of the glass run. To close this opening a thick tapered asphaltic strip is placed on the purlin at the end of the glass construction, raising the asbestos adjacent to the glass at one corner as shown.
This is done before the soft metal wing (attached to the end cover cap) is formed or fitted in place
This method of setting raises the asbestos sheeting up over the glass at the top in an "eyebrow"
Corrugated asbestos
Lead washer
Cover Cap Nose Clip
No. A1 Sealing Strip under glass
No. B1 Sealing Strip and Tapered Asphaltic Strip on top of corr. asbestos
Corrugated asbestos
Tapered Asphaltic Strip under corrugated asbestos
Purlin (size varies)
No. B2 Sealing Strip and tapered asphaltic strip under corrugated asbestos
No. A2 Sealing Strip on top of glass
¼"x1¼" bolt, Lead washer
2"x1¼"x1/16" sheet metal angle by P.W.G.Co.
Malleable iron clip
Asphaltic Strip
Purlin (size varies)
3" lap
Mastic
Corrugated Asbestos above glass
Normal position of asbestos at end of glass run.
Thick Tapered Asphaltic Strip formed of 3 standard strips and placed under the asbestos to raise it as indicated
Diagram of asbestos sheet at end of glass run
Tapered Strip "X"
Top of Purlin
Asbestos
Glass
Purlin
Corrugated asbestos at end of run of glass
Top of purlin
Corrugated asbestos below the glass
Mastic under soft wing
1/16" thick continuous metal bolt strip
Opening at end of cover cap closed by a turned down nose
Clip position at end cap
2"x2"x1/16" Sheet Metal Angle
¼" bolt when used at end cap
B1 Sealing Strip on top of asbestos
Tapered Asphaltic Strips under asbestos and on top of the sealing strip closing the asbestos so arranged as to give the glass construction a firm bearing
NOTE: Clip and Bolt cap to glass before forming soft wing to asbestos
(1) A hard metal cap and inner strip which hold the glass firmly and independent of the asbestos
(2) A 10" soft metal wing which is formed over the asbestos, trimmed to fit and bolted at 9" centers. The soft metal wing is made 3" longer than the hard metal cap at both bottom and top
The end cover cap connecting the glass and asbestos is furnished by the P.W.G. Co. in two parts, viz.
Asphaltic Strip or tape on top of purlin
No. A2 Sealing Strip on top of glass
Tapered Asphaltic Strips arranged under asbestos in conjunction with sealing strips to fill openings at bottom of asbestos.
No. B2 sealing strip under asbestos
Clip position at end cap
2"x1¼"x1/16" sheet metal angle
¼" bolt when used at end cap
No. A1 Sealing Strip under glass
Corrugated asbestos
Asphaltic Strip
Purlin (size varies)
Malleable iron clip
2"x1¼"x1/16" sheet metal angle by P.W.G.Co.
No. B2 sealing strip and tapered asphaltic strip under corrugated asbestos
No. A2 Sealing Strip on top of glass
¼"x1¼" bolt, Lead washer
Cover Cap Nose Clip
No. A1 Sealing Strip under glass
No. B1 Sealing Strip and Tapered Asphaltic Strip on top of corr. asbestos
Corrugated asbestos
Tapered Asphaltic Strip under corrugated asbestos
Purlin (size varies)
Purlin (size varies)
Asphaltic Strip
No. 2 clip
Purlin (size varies)
"J" Clip by P.W.G.Co.
Asphaltic Strip
Lead washer
Corrugated asbestos
Asbestos
Purlin
Tapered Strip "X"
Top of purlin
Corrugated asbestos below the glass
Mastic under soft wing
Clip position at end cap
2"x2"x1/16" Sheet Metal Angle
¼" bolt when used at end cap
Tapered Asphaltic Strips under asbestos and on top of the sealing strip closing the asbestos so arranged as to give the glass construction a firm bearing
Corrugated asbestos
Asphaltic Strip
Purlin (size varies)
Malleable iron clip
2"x1¼"x1/16" sheet metal angle by P.W.G.Co.
No. B2 sealing strip and tapered asphaltic strip under corrugated asbestos
No. A2 Sealing Strip on top of glass
¼"x1¼" bolt, Lead washer
Cover Cap Nose Clip
No. A1 Sealing Strip under glass
No. B1 Sealing Strip and Tapered Asphaltic Strip on top of corr. asbestos
Corrugated asbestos
Tapered Asphaltic Strip under corrugated asbestos
Purlin (size varies)
Purlin (size varies)
Asphaltic Strip
No. 2 clip
Purlin (size varies)
"J" Clip by P.W.G.Co.
Asphaltic Strip
Lead washer
Corrugated asbestos
Asbestos
Purlin
Tapered Strip "X"
Top of purlin
Corrugated asbestos below the glass
Mastic under soft wing
Clip position at end cap
2"x2"x1/16" Sheet Metal Angle
¼" bolt when used at end cap
Tapered Asphaltic Strips under asbestos and on top of the sealing strip closing the asbestos so arranged as to give the glass construction a firm bearing
Corrugated asbestos
Asphaltic Strip
Purlin (size varies)
Malleable iron clip
2"x1¼"x1/16" sheet metal angle by P.W.G.Co.
No. B2 sealing strip under asbestos
No. A2 Sealing Strip on top of glass
Tapered Asphaltic Strips arranged under asbestos in conjunction with sealing strips to fill openings at bottom of asbestos.
Asphaltic Strip or tape on top of purlin
Corrugated asbestos above glass
Mastic
Clip position at end cap
2"x1¼"x1/16" sheet metal angle
¼" bolt when used at end cap
Corrugated asbestos
Asphaltic Strip
Purlin (size varies)
Malleable iron clip
2"x1¼"x1/16" sheet metal angle by P.W.G.Co.
No. B2 Sealing Strip and tapered asphaltic strip under corrugated asbestos
No. A2 Sealing Strip on top of glass
¼"x1¼" bolt, Lead washer
Cover Cap Nose Clip
No. A1 Sealing Strip under glass
No. B1 Sealing Strip and Tapered Asphaltic Strip on top of corr. asbestos
Corrugated asbestos
Tapered Asphaltic Strip under corrugated asbestos
Purlin (size varies)
Purlin (size varies)
Asphaltic Strip
No. 2 clip
Purlin (size varies)
"J" Clip by P.W.G.Co.
Asphaltic Strip
Lead washer
Corrugated asbestos
Asbestos
Purlin
Tapered Strip "X"
Top of purlin
Corrugated asbestos below the glass
Mastic under soft wing
Clip position at end cap
2"x2"x1/16" Sheet Metal Angle
¼" bolt when used at end cap
Tapered Asphaltic Strips under asbestos and on top of the sealing strip closing the asbestos so arranged as to give the glass construction a firm bearing
Corrugated asbestos
Asphaltic Strip
Purlin (size varies)
Malleable iron clip
2"x1¼"x1/16" sheet metal angle by P.W.G.Co.
No. B2 Sealing Strip and tapered asphaltic strip under corrugated asbestos
No. A2 Sealing Strip on top of glass
¼"x1¼" bolt, Lead washer
Cover Cap Nose Clip
No. A1 Sealing Strip under glass
No. B1 Sealing Strip and Tapered Asphaltic Strip on top of corr. asbestos
Corrugated asbestos
Tapered Asphaltic Strip under corrugated asbestos
Purlin (size varies)
Purlin (size varies)
Asphaltic Strip
No. 2 clip
Purlin (size varies)
"J" Clip by P.W.G.Co.
Asphaltic Strip
Lead washer
Corrugated asbestos
Asbestos
Purlin
Tapered Strip "X"
Top of purlin
Corrugated asbestos below the glass
Mastic under soft wing
Clip position at end cap
2"x2"x1/16" Sheet Metal Angle
¼" bolt when used at end cap
Tapered Asphaltic Strips under asbestos and on top of the sealing strip closing the asbestos so arranged as to give the glass construction a firm bearing
Corrugated asbestos
Asphaltic Strip
Purlin (size varies)
Malleable iron clip
2"x1¼"x1/16" sheet metal angle by P.W.G.Co.
No. B2 sealing strip under asbestos
No. A2 Sealing Strip on top of glass
Tapered Asphaltic Strips arranged under asbestos in conjunction with sealing strips to fill openings at bottom of asbestos.
Asphaltic Strip or tape on top of purlin
Corrugated Asbestos above glass
Mastic
Clip position at end cap
2"x1¼"x1/16" sheet metal angle
¼" bolt when used at end cap
Corrugated asbestos
Asphaltic Strip
Purlin (size varies)
Malleable iron clip
2"x1¼"x1/16" sheet metal angle by P.W.G.Co.
No. B2 Sealing Strip and tapered asphaltic strip under corrugated asbestos
No. A2 Sealing Strip on top of glass
¼"x1¼" bolt, Lead washer
Cover Cap Nose Clip
No. A1 Sealing Strip under glass
No. B1 Sealing Strip and Tapered Asphaltic Strip on top of corr. asbestos
Corrugated asbestos
Tapered Asphaltic Strip under corrugated asbestos
Purlin (size varies)
Purlin (size varies)
Asphaltic Strip
No. 2 clip
Purlin (size varies)
"J" Clip by P.W.G.Co.
Asphaltic Strip
Lead washer
Corrugated asbestos
Asbestos
Purlin
Tapered Strip "X"
Top of purlin
Corrugated asbestos below the glass
Mastic under soft wing
Clip position at end cap
2"x2"x1/16" Sheet Metal Angle
¼" bolt when used at end cap
Tapered Asphaltic Strips under asbestos and on top of the sealing strip closing the asbestos so arranged as to give the glass construction a firm bearing
Corrugated asbestos
Asphaltic Strip
Purlin (size varies)
Malleable iron clip
2"x1¼"x1/16" sheet metal angle by P.W.G.Co.
No. B2 Sealing Strip and tapered asphaltic strip under corrugated asbestos
No. A2 Sealing Strip on top of glass
¼"x1¼" bolt, Lead washer
Cover Cap Nose Clip
No. A1 Sealing Strip under glass
No. B1 Sealing Strip and Tapered Asphaltic Strip on top of corr. asbestos
Corrugated asbestos
Tapered Asphaltic Strip under corrugated asbestos
Purlin (size varies)
Purlin (size varies)
Asphaltic Strip
No. 2 clip
Purlin (size varies)
"J" Clip by P.W.G.Co.
Asphaltic Strip
Lead washer
Corrugated asbestos
Asbestos
Purlin
Tapered Strip "X"
Top of purlin
Corrugated asbestos at end of run of glass
Mastic under soft wing
1/16" thick continuous metal bolt strip
Opening at end of cover cap closed by a turned down nose
No. A1 Sealing Strip under glass
B1 Sealing Strip on top of asbestos
Tapered Asphaltic Strips under asbestos and on top of the sealing strip closing the asbestos so arranged as to give the glass construction a firm bearing
NOTE
The conditions shown on this drawing have been assumed at random.
No attempt has been made to show any ideal set of conditions
The staggered joint method of laying asbestos is indicated
Use of the straight joint method (cut corners) will not change these details



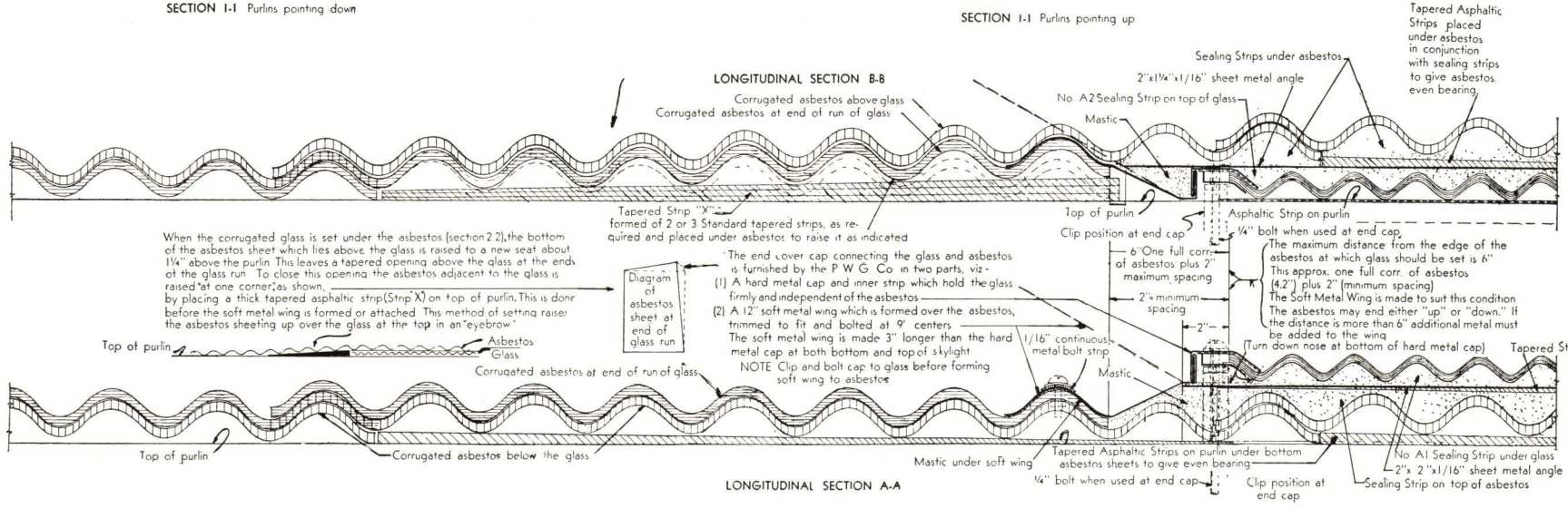
SECTION 2-2 Purlins pointing down

SECTION 1-1 Purlins pointing down



SECTION 2-2 Purlins pointing up

SECTION 1-1 Purlins pointing up



NOTE
The conditions shown on this drawing have been assumed, at random
No attempt has been made to show any ideal set of conditions

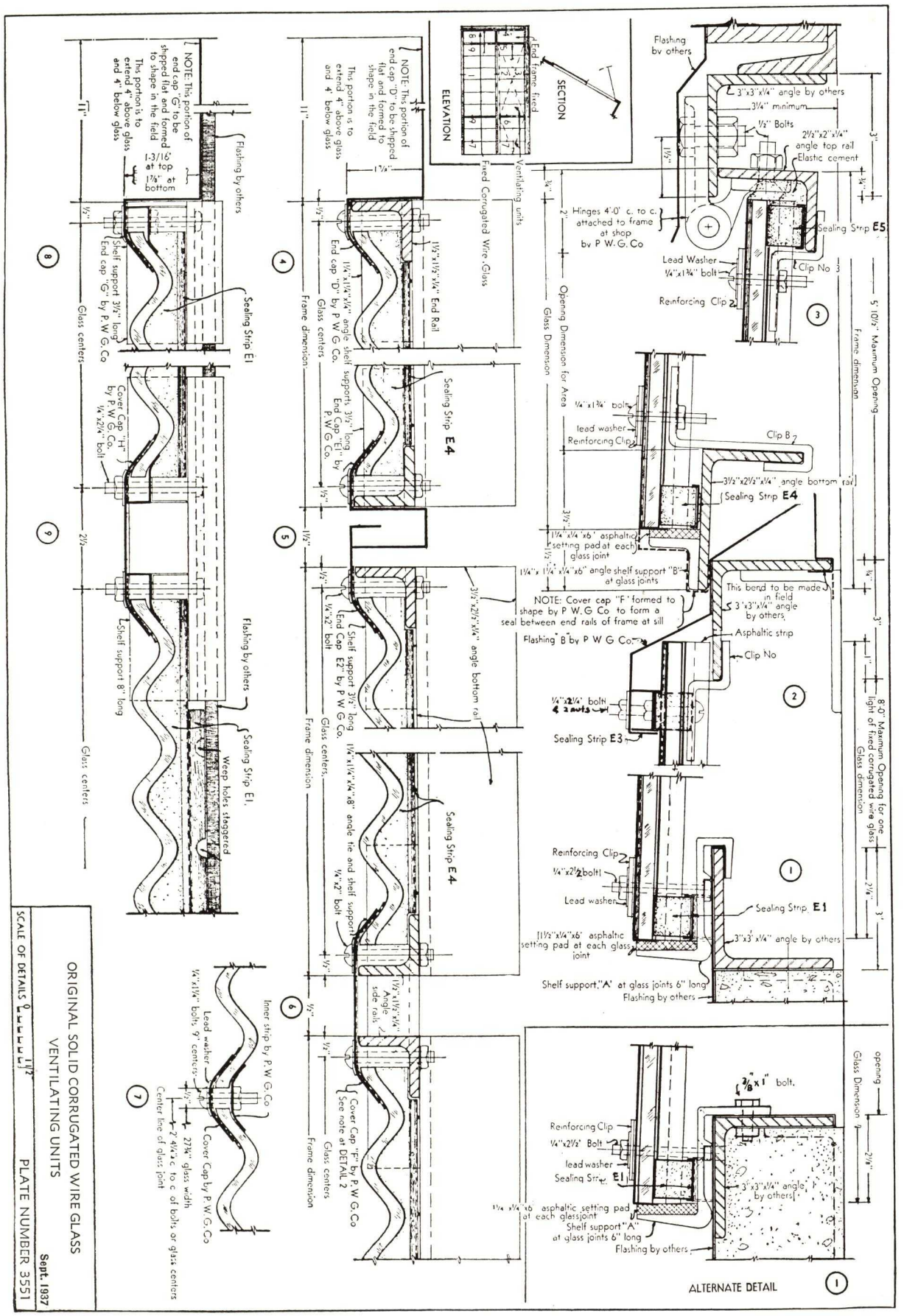
This drawing to be used in conjunction with drawing No. 2700

ORIGINAL SOLID CORRUGATED WIRE GLASS
Used with 4.2" Pitch
CORRUGATED ASBESTOS

Sept. 1937

SCALE OF DETAILS 0" 3"

PLATE 2700B

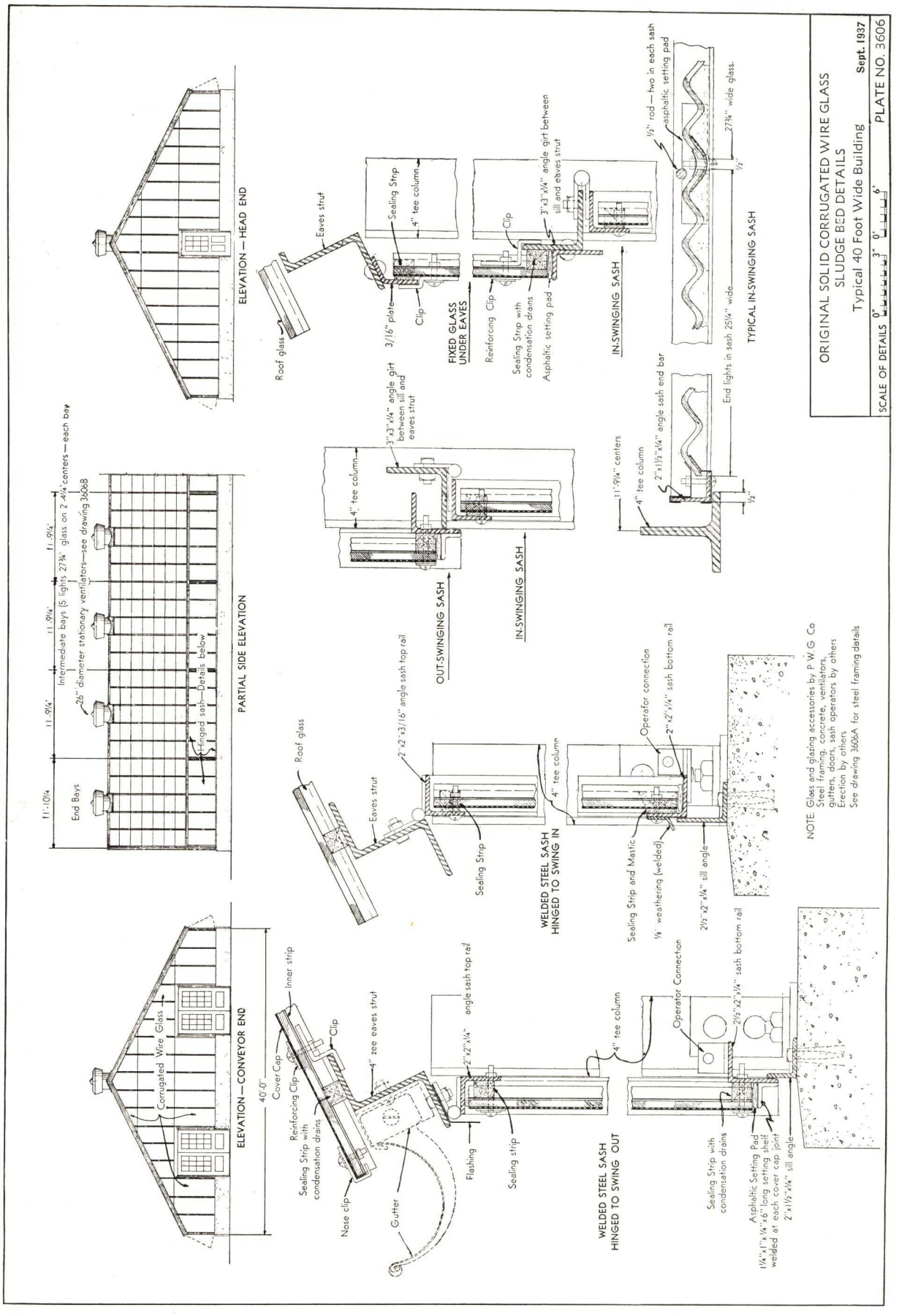


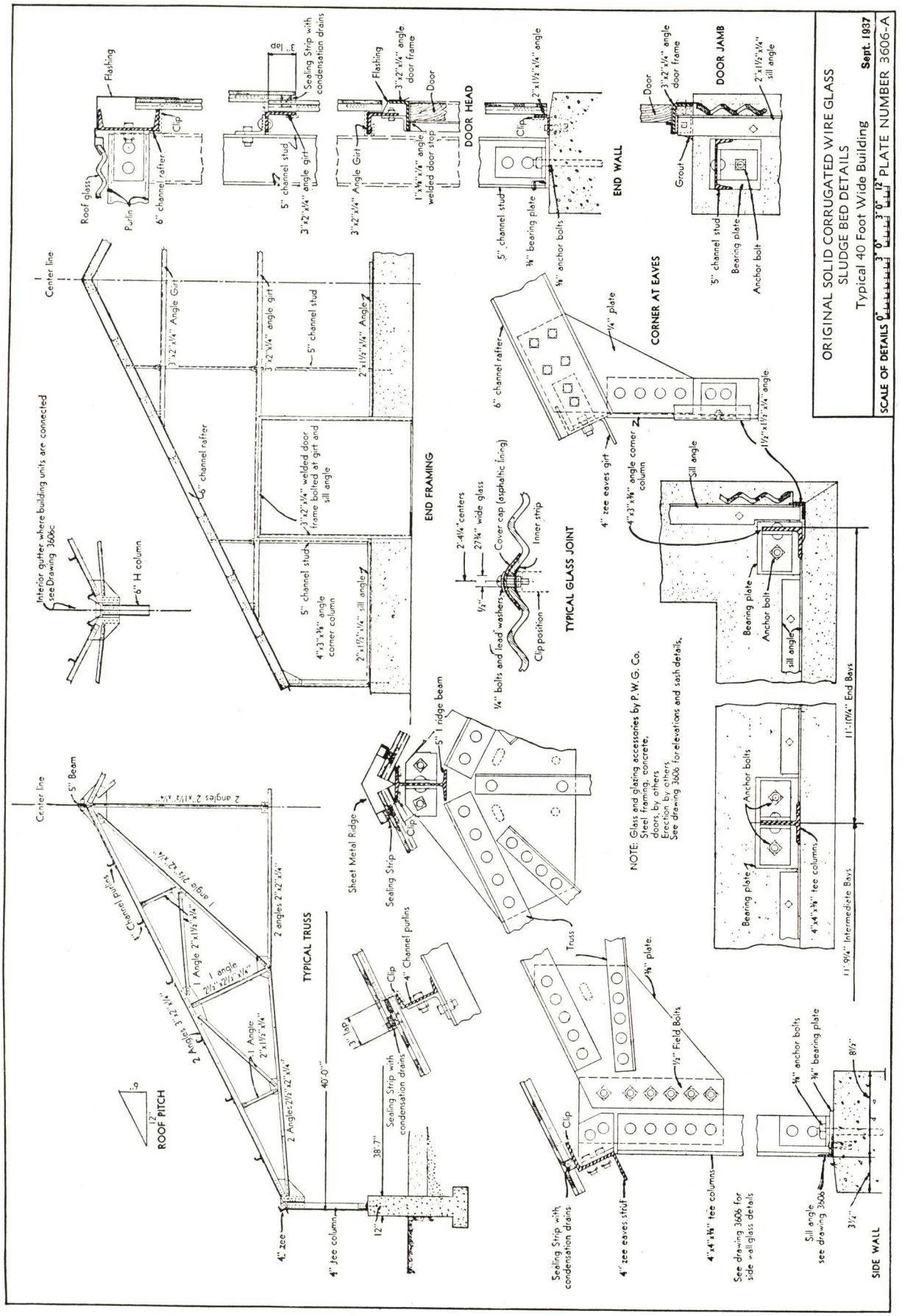
ORIGINAL SOLID CORRUGATED WIRE GLASS VENTILATING UNITS

SCALE OF DETAILS 1 1/2"

Sept. 1937

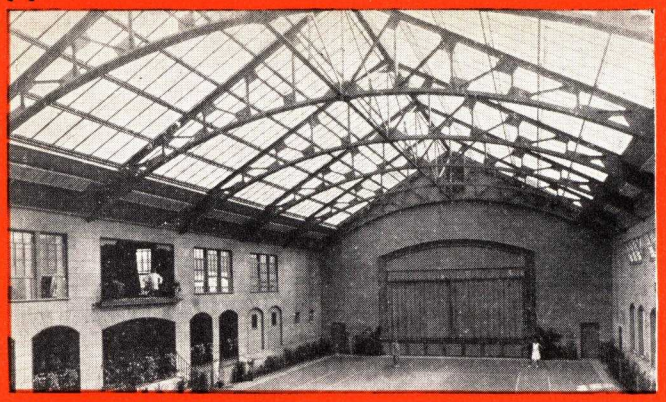
PLATE NUMBER 3551


ELEVATION — HEAD END
PARTIAL SIDE ELEVATION
11'-10¼
End Bays
11'-9¼
11'-9¼
11'-9¼
Intermediate bays (5 lights 27¾" glass on 2-4¼" centers — each bay
26" diameter stationary ventilators—see drawing 3606B
Fringed sash—Details below
ELEVATION — CONVEYOR END
40'-0"
Corrugated Wire Glass
Cover Cap
Inner strip
Reinforcing Clip
Clip
Sealing Strip with condensation drains
4" zee eaves strut
Nose clip
Gutter
2"x2"x2"x¼" angle sash top rail
Flashing
Sealing strip
4" tee column
WELDED STEEL SASH HINGED TO SWING OUT
Operator Connection
2½"x2"x¼" sash bottom rail
Sealing Strip with condensation drains
Asphaltic Setting Pad
1¼"x1"x¼"x6" long setting shelf welded at each cover cap joint
2"x1½"x¼" sill angle
Roof glass
Eaves strut
2"x2"x3/16" angle sash top rail
Sealing Strip
WELDED STEEL SASH HINGED TO SWING IN
Operator connection
2"x2"x¼" sash bottom rail
Sealing Strip and Mastic
⅛" weathering (welded)
2½"x2"x¼" sill angle
OUT-SWINGING SASH
4" tee column
3"x3"x¼" angle girt between sill and eaves strut
IN-SWINGING SASH
Roof glass
Eaves strut
3/16" plate
Clip
Sealing Strip
4" tee column
FIXED GLASS UNDER EAVES
Reinforcing Clip
Sealing Strip with condensation drains
Asphaltic setting pad
3"x3"x¼" angle girt between sill and eaves strut
IN-SWINGING SASH
11'-9¼" centers
4" tee column
2"x1½"x¼" angle sash end bar
End lights in sash 25¼" wide
½" rod — two in each sash
Asphaltic setting pad
27¾" wide glass.
½"
TYPICAL IN-SWINGING SASH
NOTE: Glass and glazing accessories by P W G Co
Steel framing, concrete, ventilators, gutters, doors, sash operators by others
Erection by others
See drawing 3606A for steel framing details
ORIGINAL SOLID CORRUGATED WIRE GLASS SLUDGE BED DETAILS
Typical 40 Foot Wide Building
Sept. 1937
SCALE OF DETAILS 0" 3" 0' 6'
PLATE NO. 3606


ORIGINAL SOLID CORRUGATED WIRE GLASS
SLUDGE BED DETAILS
Typical 40 Foot Wide Building
Sept. 1937
SCALE OF DETAILS 0" 3" 0" 3" 0" 12" PLATE NUMBER 3606-A
ROOF PITCH
TYPICAL TRUSS
END FRAMING
TYPICAL GLASS JOINT
DOOR HEAD
END WALL
CORNER AT EAVES
DOOR JAMB
SIDE WALL
NOTE: Glass and glazing accessories by P.W.G. Co.
Steel framing, concrete,
doors, by others
Erection by others
See drawing 3606 for elevations and sash details.
Interior gutter where building units are connected see Drawing 3606c
Center line
Roof glass
Purlin
6" channel rafter
Flashing
Clip
Sealing Strip with condensation drains
5" channel stud
3"x2"x¼" angle girt
3"x2"x¼" angle door frame
Door
1"x⅜"x⅛" angle welded door stop
5" channel stud
⅜" bearing plate
⅝" anchor bolts
2"x1½"x¼" angle
Grout
Bearing plate
Anchor bolt
2"x1½"x¼" sill angle
3"x2"x¼" Angle Girt
2"x1½"x¼" Angle
3"x2"x¼" welded door frame bolted at girt and sill angle
4"x3"x⅜" angle corner column
2"x1½"x¼" sill angle
6" H column
2'-4¼" centers
27¾" wide glass
Cover cap (asphaltic lining)
Inner strip
¼" bolts and lead washers
Clip position
¼" plate
4" zee eaves girt
1½"x1½"x¼" angle
4"x3"x⅜" angle corner column
Sill angle
Anchor bolts
4"x4"x⅜" tee columns
11'-10¼" End Bays
11'-9¼" Intermediate Bays
5" Beam
2 angles 2"x1½"x¼"
4" Channel purlins
1 Angle 2"x1½"x¼"
2 angles 2"x2"x¼"
2 Angles 3"x2"x¼"
40'-0"
38'-7"
12"
4" zee
4" tee column
Sealing Strip with condensation drains
Sheet Metal Ridge
5" I ridge beam
Truss
⅜" plate
½" Field Bolts
4" zee eaves strut
4"x4"x⅜" tee columns
See drawing 3606 for side wall glass details
Sill angle see drawing 3606
⅝" anchor bolts
⅜" bearing plate
8½"
3¼"

PENNSYLVANIA WIRE GLASS COMPANY

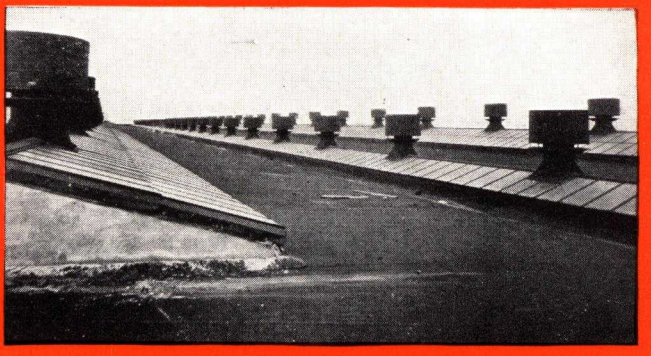
PHILADELPHIA, PA.



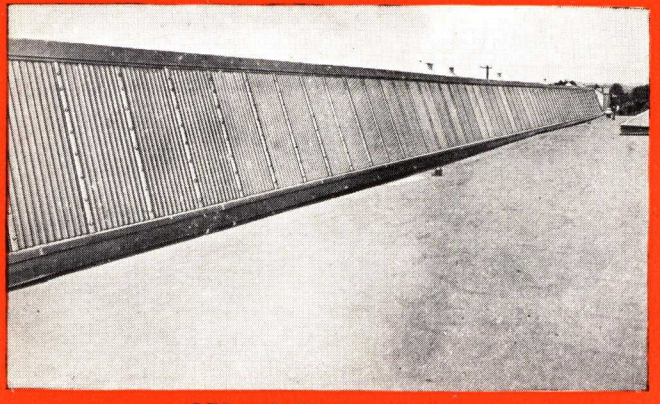
INDOOR TENNIS COURT OF MRS. H. E. TALBOT
DAYTON, OHIO
C. W. G. Roof

PENNSYLVANIA RAILROAD STATION
NEWARK, N. J.
20,824 sq. ft. C. W. G. Skylight Construction

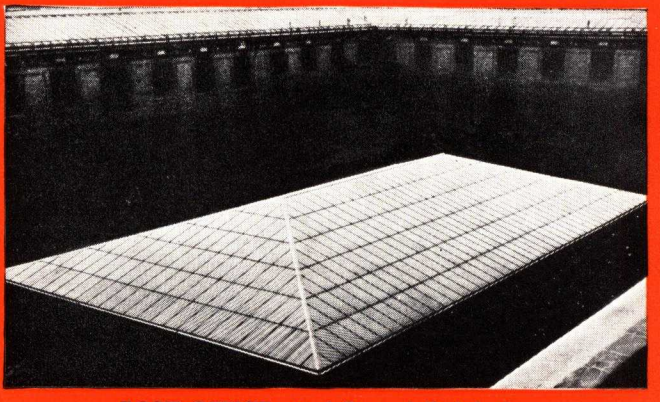
U. S. PIPE AND FOUNDRY COMPANY
CHATTANOOGA, TENN.
14,836 sq. ft. White and Actinic C. W. G. Sidewall Construction



CHESAPEAKE AND OHIO R. R. SHOPS
RUSSELL, KY.
68,000 sq. ft. Curb Skylights



LELAND ELECTRIC CO.
DAYTON, OHIO
20,000 sq. ft. Sawtooth Skylights



POST OFFICE, 33rd St. and Eighth Ave.
NEW YORK CITY
7,100 sq. ft. Hip Skylight

FORD MOTOR CO.
LINCOLN DIVISION—DETROIT, MICH.
C. W. G. on Back Slopes of Sawtooths

LIBBEY-OWENS SHEET GLASS CO.
TOLEDO, OHIO
C. W. G. Sawtooth Skylights

SECTION 7

CONTINUED ⟶

SUPER-STEEL PRODUCTS CO.

325 West McKinley Avenue, MILWAUKEE, WIS.

SUPER EXTRUDED ALUMINUM SKYLIGHTS

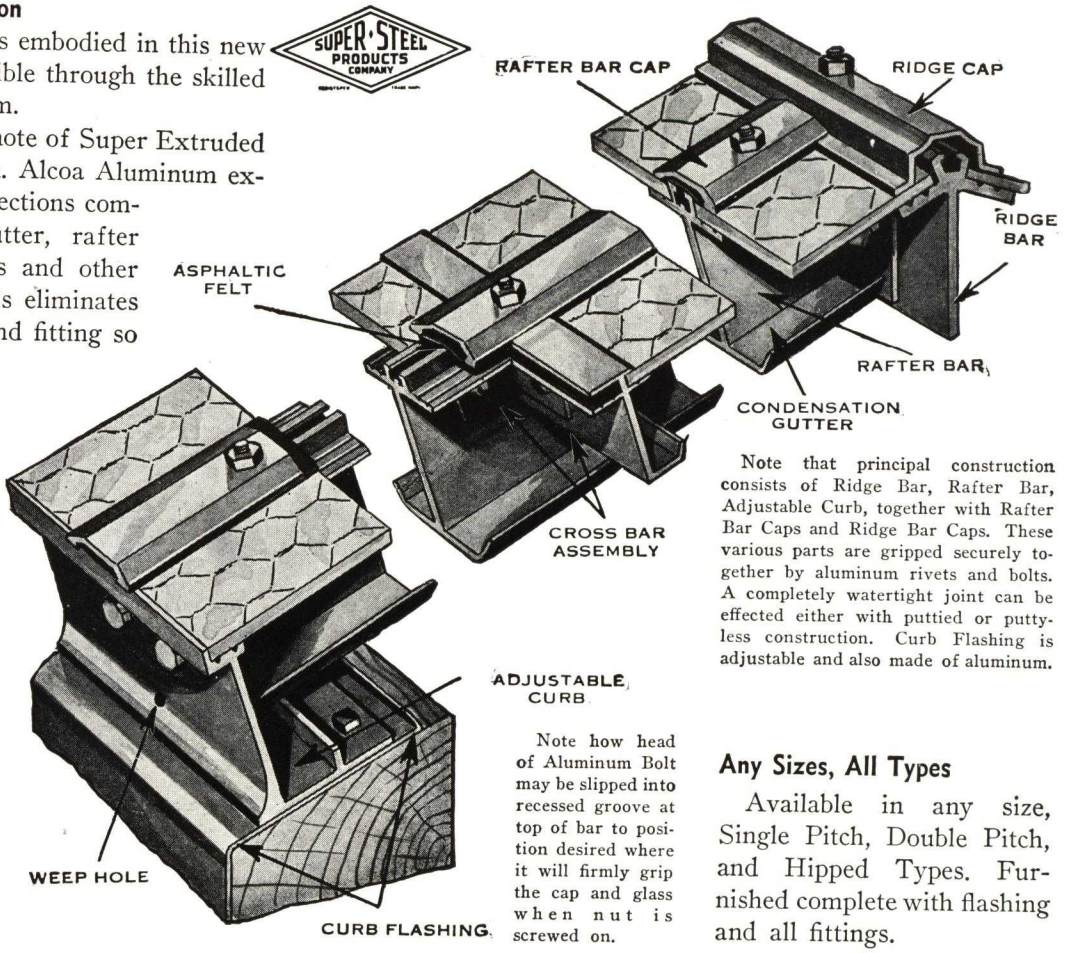
Simplicity of Construction

The many advantages embodied in this new skylight are made possible through the skilled use of Alcoa Aluminum.

Simplicity is the keynote of Super Extruded Aluminum construction. Alcoa Aluminum extruded into one-piece sections combines condensation gutter, rafter bar, shoulder for glass and other necessary factors. This eliminates all welding, mitering and fitting so often required in the ordinary type of skylight.

Free from Corrosion

Made from Alcoa 53-ST5 Alloy Aluminum of exceptional strength and free from corrosion, this skylight need never be painted inside or out. Because of its light weight, it does not require heavy roof construction. Shipped, knocked down, crated and boxed it is easily assembled on the job.

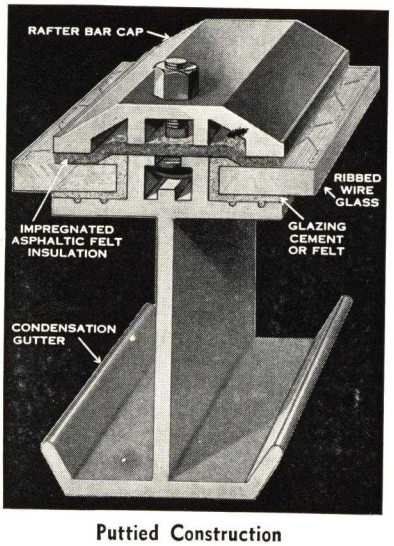


Note that principal construction consists of Ridge Bar, Rafter Bar, Adjustable Curb, together with Rafter Bar Caps and Ridge Bar Caps. These various parts are gripped securely together by aluminum rivets and bolts. A completely watertight joint can be effected either with puttied or puttyless construction. Curb Flashing is adjustable and also made of aluminum.

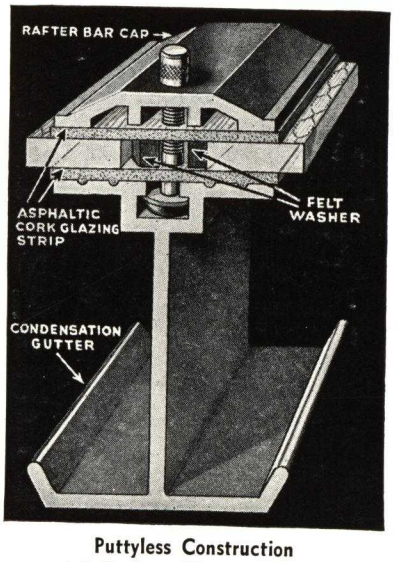
Note how head of Aluminum Bolt may be slipped into recessed groove at top of bar to position desired where it will firmly grip the cap and glass when nut is screwed on.

Any Sizes, All Types

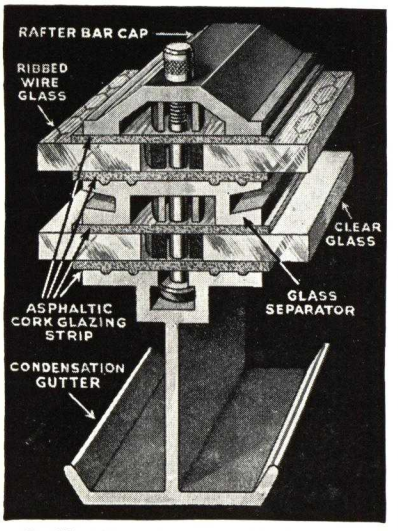
Available in any size, Single Pitch, Double Pitch, and Hipped Types. Furnished complete with flashing and all fittings.



Puttied Construction



Puttyless Construction



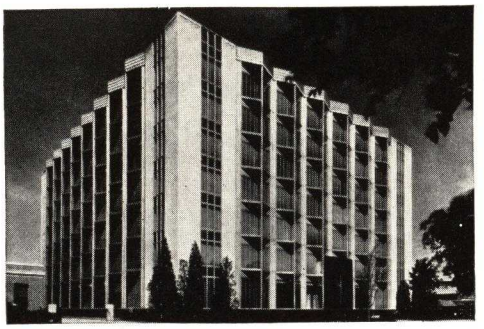
Double Glass, Puttyless Construction

Above Illustrations not full size. Sizes available to meet all conditions

CONSTRUCTION DETAILS, SUPER EXTRUDED ALUMINUM SKYLIGHTS

Partial List of Installations

Building	Location	Architects
Water Purification Plant	Milwaukee, Wis.	City Engineers' Office
U. S. Post Office	High Point, N. Car.	Workman, Everhard & Voorhees
Chain Belt Company	Milwaukee, Wis.	Owner
West Side Filter Plant	Denver, Colorado	Alvord, Burdick & Howson, Engrs.
High School	Rapid City, S. Dak.	Perkins & Wayne
Shushan Airport	New Orleans, La.	Weiss, Dreyfous & Seiferth
Mandel-Rice Co.	Iron River, Mich.	D. Anderson
Lyndonville School	Lyndonville, N. Y.	Raymond A. Freeburg
T. M. E. R. & L. Co. Power Plant	Port Washington, Wis.	Fred Luber



A. O. Smith Aluminum Research Building, Milwaukee, Wis.

Holabird & Root, Architects

Entire exterior of building extruded aluminum which was fabricated and erected by Super Steel Products Co.

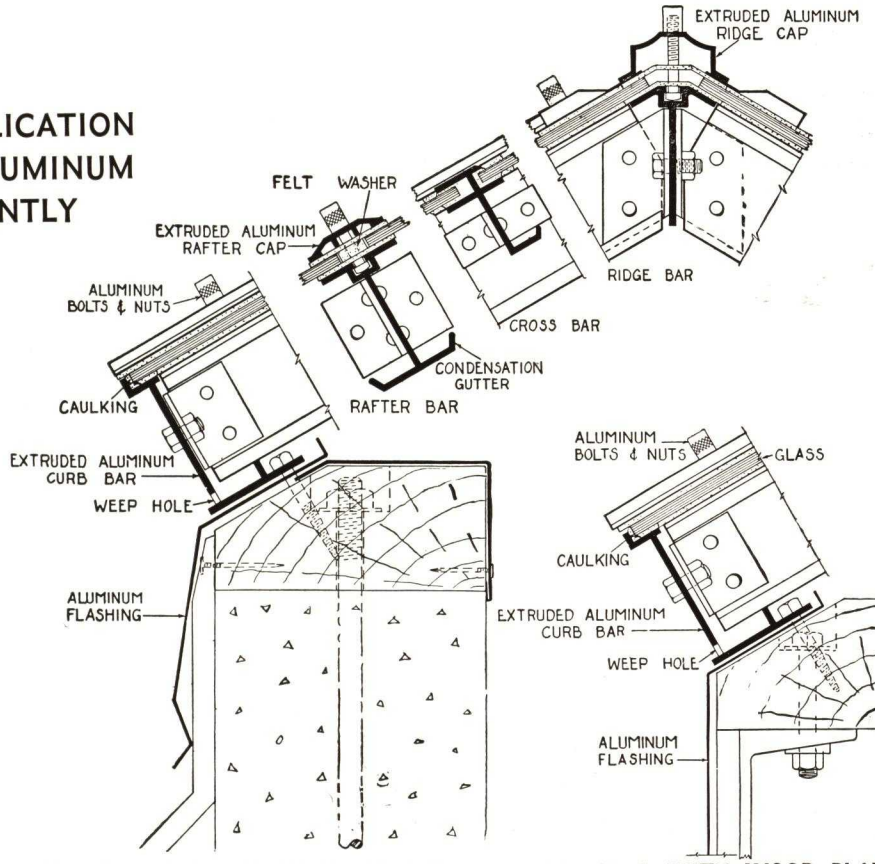
DETAILS SHOWING APPLICATION OF SUPER EXTRUDED ALUMINUM SKYLIGHTS ON FREQUENTLY USED TYPES OF CURB

Specifications

Skylights where shown on drawings shall be Super Extruded Aluminum Skylights as manufactured by the Super Steel Products Company, Milwaukee, Wisconsin, erected in accordance with the manufacturer's instructions on curbs shown on detail drawings.

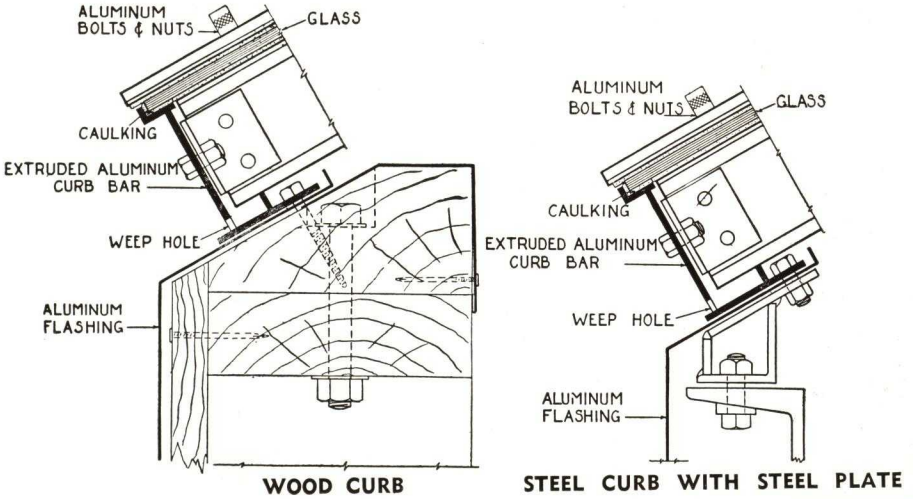
All rafter bars shall be fastened to ridge and curb clips with button head rivets, and these clips shall be fastened to ridge and curb with two bolts each. All bolts, nuts and rivets are to be aluminum. Glass shall be ¼-in. ribbed wired securely set in approved glazing cement or felt with ribs down as instructed by the manufacturer. After Skylight is glazed all bar and ridge caps are to be securely bolted in place. An insulating asphaltic felt is to be used between cap and glass.

Skylight flashing shall be No. 24 B&S Gauge as furnished with the skylights and wherever such flashing comes in contact with metal other than aluminum an insulating felt shall be used to prevent electrolysis.



CONCRETE CURB WITH WOOD PLATE

STEEL CURB WITH WOOD PLATE



WOOD CURB

STEEL CURB WITH STEEL PLATE

VENT-O-LITE COMPANY

Industrial Skylights and Ceiling Light Sash

4230 West Taylor Street, CHICAGO, ILL.

Product

PUTTYLESS OR PUTTIED, STATIONARY OR VENTILATING GABLE AND SAWTOOTHED SKYLIGHTS; STANDARDIZED CEILING LIGHT SASH.

Construction

Heavy 18-gauge pressed steel sections, assembled without solder and supported on steel angle trusses spaced not more than 6 ft. on centers, provide an individual structure of the skylight unit.

Materials

As required by the nature of building, Vent-O-Lite is furnished in galvanized copper-bearing steel, copper or aluminum.

Operating Device

A heavy rack and pinion type driven by a worm and worm gear, controlled from the floor with either loose rod or chain. Information relative motor operator control will be furnished on request.

Standard Puttyless Construction

Designed to reduce maintenance expense, at only a slight increase in initial cost over putty glazing. Vent-O-Lite provides those desirable features required for a high grade assembly

Feature

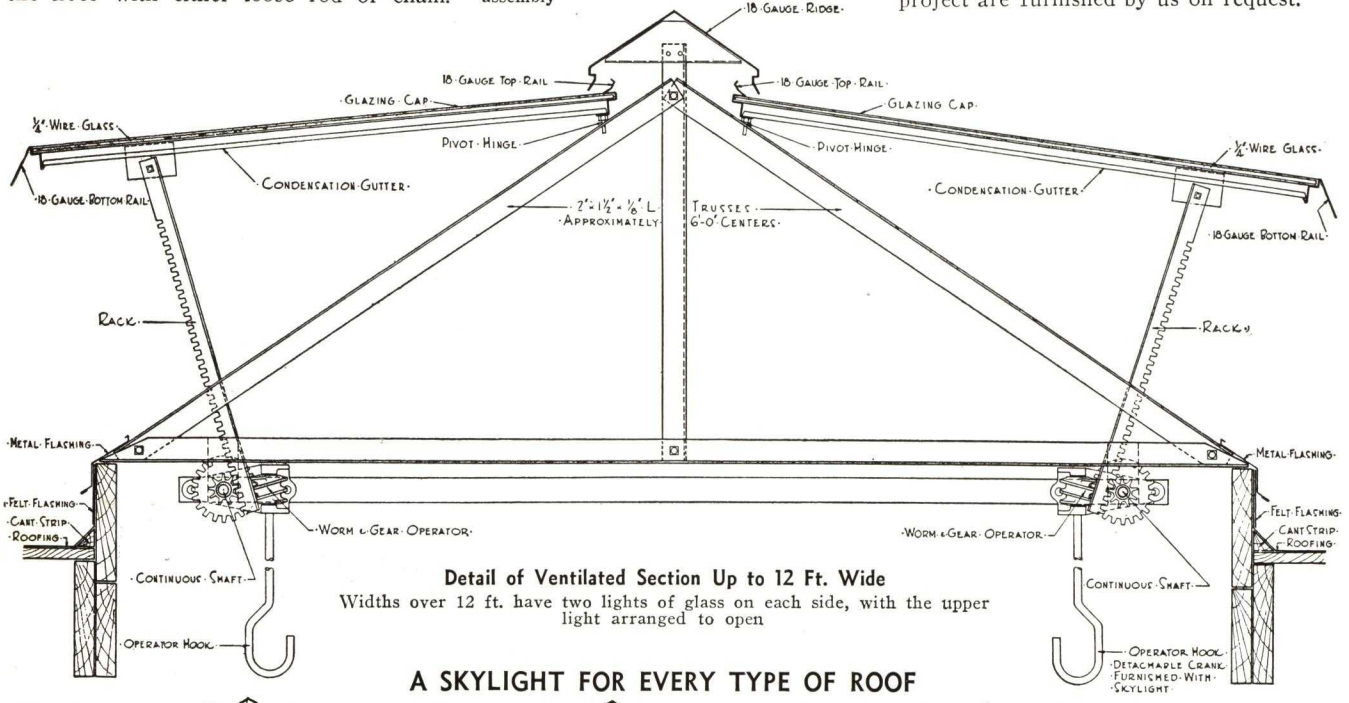
Standard sizes described by the outside to outside dimensions of the curb are carried in stock, to facilitate prompt shipment. Standard sizes are multiples of 2 ft. in width and length.

Erection

These skylights are erected complete by our own erection crew, or can be erected by others from our instructions and setting plans, depending upon the size of the installation.

Details

Detail drawings and specifications to incorporate in the plans of the individual project are furnished by us on request.



Detail of Ventilated Section Up to 12 Ft. Wide

Widths over 12 ft. have two lights of glass on each side, with the upper light arranged to open

A SKYLIGHT FOR EVERY TYPE OF ROOF

Type A Gable—Max. width 12 ft.

Type B Gable—Widths over 12 ft.

Type AX Max. width 10 ft.

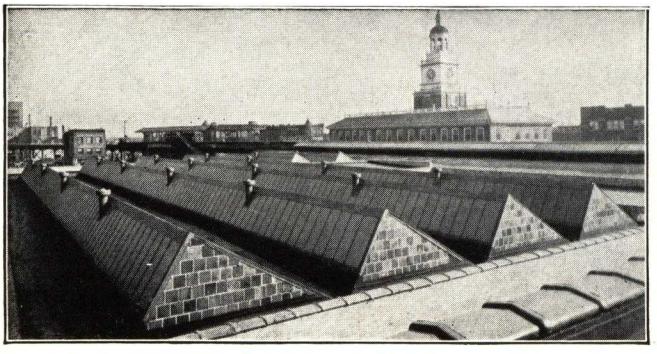
Type BX Widths over 10 ft.

Type A Single Pitch Max. width 7 ft.

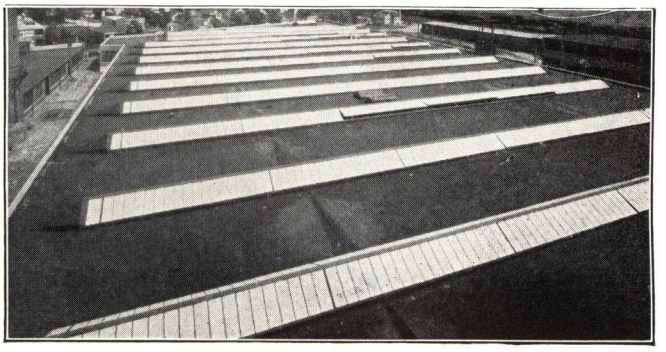
Type B Single Pitch Widths over 7 ft.

Type A Sawtooth Max. height 7 ft.

Type B Sawtooth Heights over 7 ft.



Puttyless Sawtooth Skylights



26,000 Sq. Ft. of Standard Vent-O-Lite

P. M. BRUNER GRANITOID CO.

ESTABLISHED 1878

710 Louderman Building
ST. LOUIS, MO.

SIDEWALK LIGHTS, FLOOR LIGHTS, SKYLIGHTS

Bruner Construction

Bruner sidewalk lights, floor lights and skylights conform to recommendations adopted by United States Department of Commerce, Division of Simplified Practice, as per bulletin No. 49.

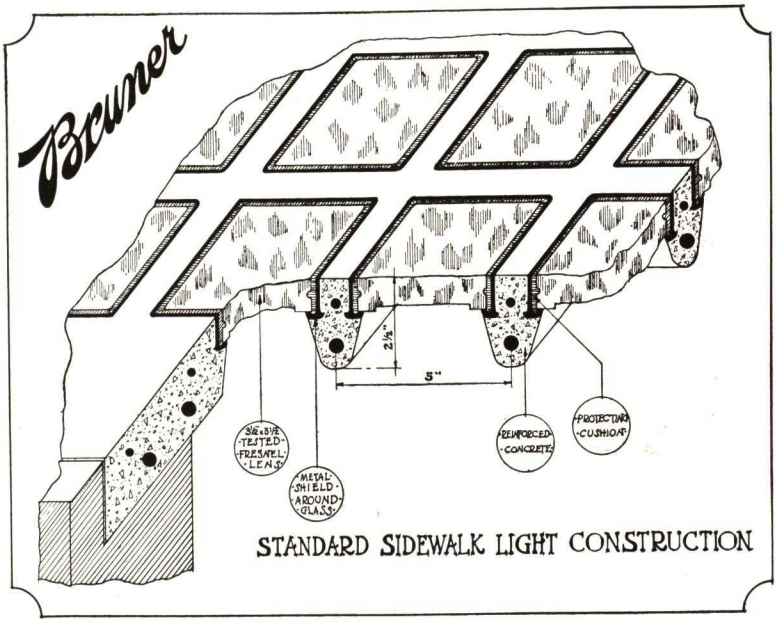
Standard Sidewalk Light Construction

In this construction there can be no leakage and no breakage of glass from structural or expansion stresses. Glass broken from accident or abuse can easily be repaired without disfiguring the construction in any way.

Specifications—The sidewalk lights shown on plan shall be of two-way reinforced concrete rib construction as shown in P. M. Bruner Granitoid Co.'s Standard Sidewalk Light Bulletin, capable of carrying safe live load of 300 lb. per sq. ft. The glass to be 3½ in. square by ¾ in. thick at supporting edge, set in 4-in. square metal shields with elastic compound. The lenses shall be set 5 in. on center. The ribs shall be 2½ in. deep.

Bearing furnished for this construction should be 3 in. wide by 2¾ in. deep.

The entire construction to be guaranteed waterproof and free of defects for a period of one year. Replacement glass to be furnished free f.o.b. factory for 5 years.



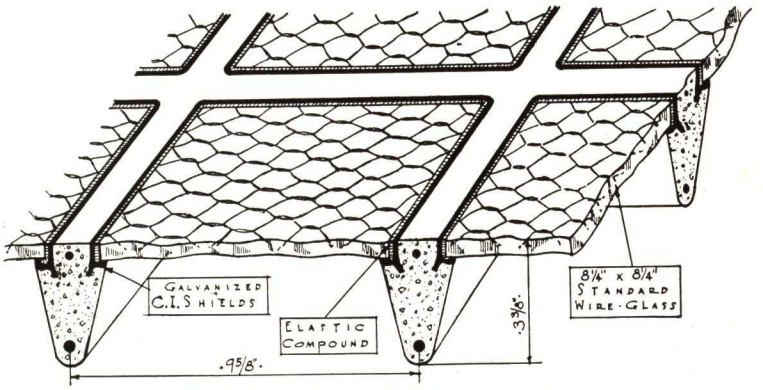
Bruner Skylight Construction (Trade Name, "Transparent Roofing")

We recommend that concrete curbs be formed as part of the reinforced concrete roof. Bruner reinforced concrete skylights being laid over these curbs and projecting beyond with drip formed on under side, a permanently mechanical watertight job is assured.

Where required, however, this skylight construction can be made flush with roof by setting same in rabbet formed in reinforced concrete and calking with our special waterproof compound.

Specifications—The skylights shown on plan shall be of two-way reinforced concrete rib construction as shown in P. M. Bruner Granitoid Co.'s Skylight Bulletin. Glass to be ribbed wire 8¼ in. square, set in metal shields with elastic compound. Ribs shall be 3⅜ in. deep, set 9⅝ in. on centers both ways. The entire construction is to be guaranteed for one year, and replacement glass is to be furnished free of charge for a period of five years.

(Plans should show detail of bearing furnished.)

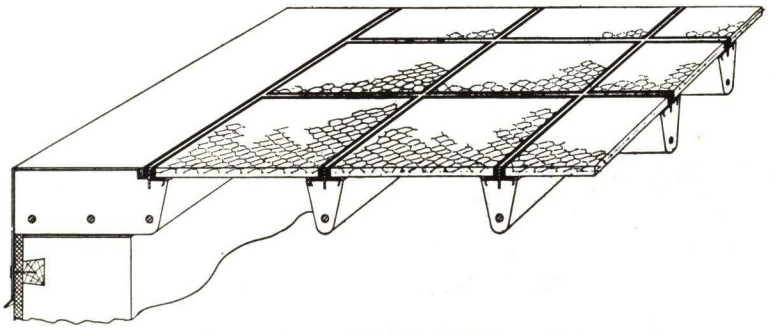


Detail Bruner System Skylight Construction

Spans up to 8 ft. can be made without intermediate beams. Standard construction ribs are on 9⅝-in. centers. Standard wire glass is 8¼x8¼ in. The metal shield and protecting cushion construction is similar to that in the Bruner sidewalk lights

Bruner Bronze-Grid Skylights

In this type reinforced concrete skylight construction, no concrete is exposed on the top surface. It gives an attractive appearance as well as being efficient and weatherproof.



Bruner Bronze-Grid Skylight Construction

RICHARDS & KELLY MANUFACTURING CO.

ESTABLISHED 1885

309-311 West Twenty-third Street
CHICAGO, ILL.

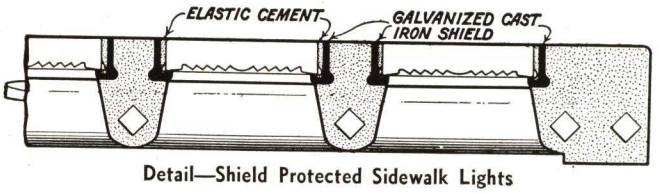
PRODUCTS

Shield Protected Sidewalk Lights
Transparent Roofing
Permalite Roofing
Standard Sidewalk Doors
Heavy Duty Sidewalk Doors
Coalhole Covers and Frames

SIDEWALK LIGHTS AND ROOF LIGHTS

Shield Protected Sidewalk Lights

For use where construction will be subjected to heavy pedestrian traffic and wide temperature variations with a minimum of maintenance.



Detail—Shield Protected Sidewalk Lights

Specifications — All sidewalk lights as shown on plans shall be RICHARDS & KELLY MANUFACTURING COMPANY'S *Shield Protected* construction, using 3½-in. square glass, set in galvanized cast iron shields. Construction shall be capable of sustaining a minimum live load of 300 lbs. per sq. ft. uniformly distributed.

Glass Guarantee

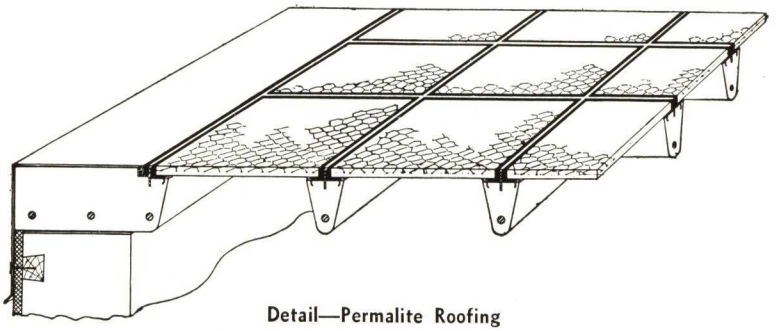
We will furnish free of charge, f.o.b. our factory, any glass broken in our galvanized cast iron shield construction for a period of five years, unless breakage is caused by fire or misuse.

Permalite Roofing

Permanent Skylights

Leakproof — burglarproof — fireproof — permanent. These are but a few of the many features of the new *Permalite* reinforced concrete roofing construction. It is essentially different from older types in that no concrete is exposed to the weather.

Construction—*Permalite* roofing, as shown, is available in the standard construction using 9-in. square glass spaced on 9⅝-in. centers or with larger glass units if desired. Panel thicknesses vary with length of span and size of glass used.

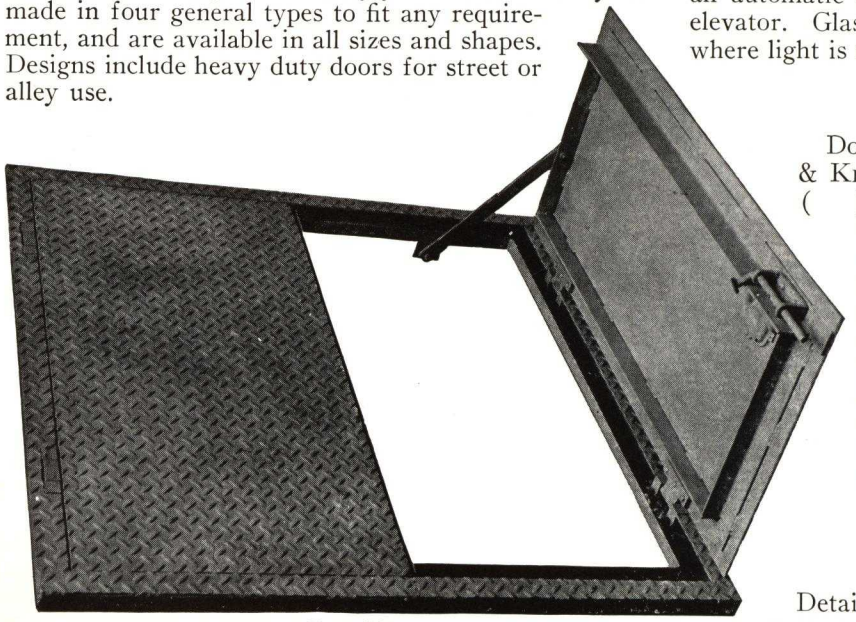


Detail—Permalite Roofing

SIDEWALK DOORS

General Information

All doors are of the finest construction and have been proven satisfactory in over fifty years of use. They are made in four general types to fit any requirement, and are available in all sizes and shapes. Designs include heavy duty doors for street or alley use.



Type "C" Door—Watertight

Special Equipment

Doors can be furnished with striker plates and with an automatic lock operated with the bow irons of an elevator. Glass insets can be placed in the door leaves where light is required in the space below.

Specifications

Doors as shown on plans shall be RICHARDS & KELLY MANUFACTURING COMPANY'S Type ( ), or equal and shall conform with city ordinances. Doors shall be flush and capable of sustaining a live load of at least 300 lbs. per sq. ft., evenly distributed (heavier, if required). All exposed surfaces shall be covered with checkered plate and door leaves fitted with brass hinges. Arms shall be furnished to hold doors in open position and to prevent hinge strain. (If watertight) doors shall be provided with gutters at least 1¾ in. wide tapped for drain connection.

Details

Details and descriptive literature will be sent upon request.

ÆOLUS DICKINSON

INDUSTRIAL DIVISION PAUL DICKINSON, INCORPORATED

TELEPHONE
Lafayette 1862,
1863

Ventilators, Roof Drains, Scuppers and Exhaust Heads
3322-3342 South Artesian Avenue, CHICAGO, ILL.

PRODUCTS

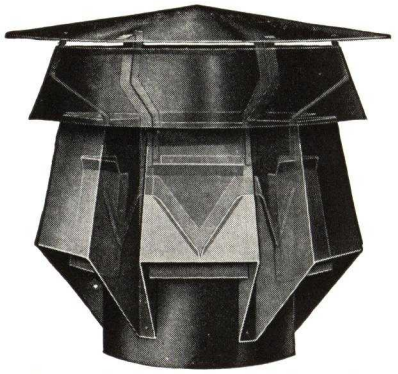
"Æolus" Improved Double Syphon Roof Ventilators; Ferrocast Roof Drains; Dickinson Ferrocast Scuppers; "Air Gate" Scuppers.

Dickinson Ferrocast Floor Ventilators (Mushroom Type), Dickinson Ferrocast Exhaust Heads, and Dickinson Ferrocast Wall Vents.

Dickinson Ferrocast Chimneys (Adjustable Roof Connections).

"ÆOLUS" IMPROVED DOUBLE SYPHON ROOF VENTILATORS

"Æolus" ventilators are used by big industries and railroads as well as on hotels, school and office buildings. Made of any sheet metal or cast iron. No mechanical parts to get out of order. No maintenance expense.

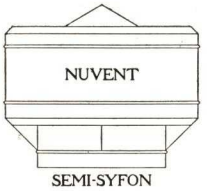


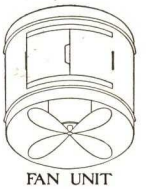
"Æolus" Double Syphon Roof Ventilator

Improved Ventilator Designs—Various new types improved for greater speed under low wind currents to increase exhaust. All sizes and metals furnished.

Prices and test sheets on request.

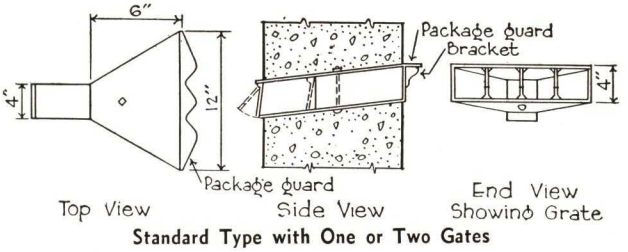
Fan Units—Fan units separate or with any type ventilator to remove excess steam or smoke.





DICKINSON FERROCAST SCUPPERS

They only cost a few dollars apiece but are worth their weight in gold when a fire occurs. They are simple, effective, durable, easily installed and approved by Underwriters' Laboratories, Inc. Made in 9 to 24-in. sizes. One scupper for 1000 sq. ft. floor area.

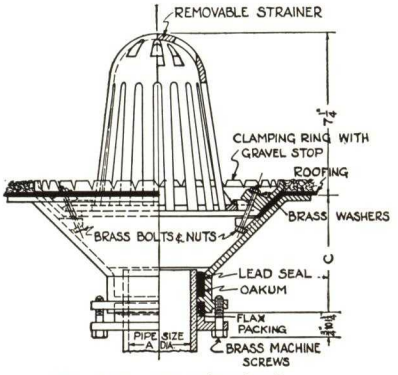


Standard Type with One or Two Gates

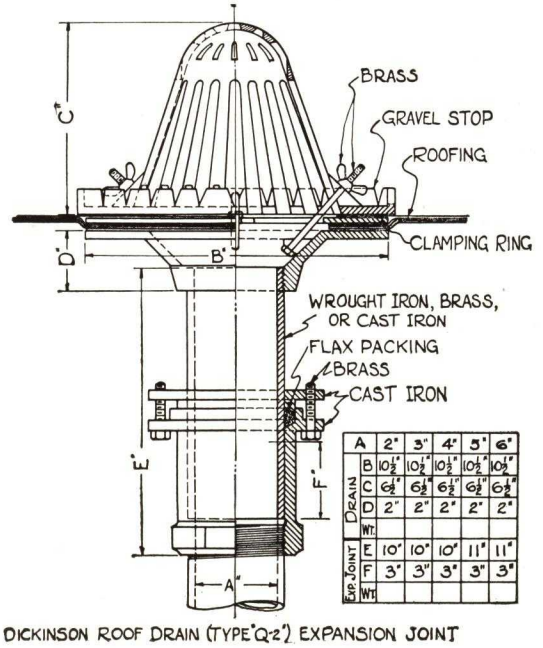
DICKINSON FERROCAST ROOF DRAIN

This roof drain is of large area and substantial construction.

Made in all sizes with or without expansion joint. Also made with side outlet. Brass and aluminum drains and expansion joint with wrought iron or brass sleeve. In service on government, industrial and railroad buildings.



DICKINSON ROOF DRAIN (TYPE "AQX")



A	2"	3"	4"	5"	6"
B	10½"	10½"	10½"	10½"	10½"
C	6½"	6½"	6½"	6½"	6½"
D	2"	2"	2"	2"	2"
Wt.					
E	10"	10"	10"	11"	11"
F	3"	3"	3"	3"	3"
Wt.					

DICKINSON ROOF DRAIN (TYPE "Q-2") EXPANSION JOINT

ESTABLISHED 1906

AREX COMPANY

KERNCHEN COMPANY

Industrial Ventilating Engineers

333 Michigan Avenue Building, CHICAGO, ILL.

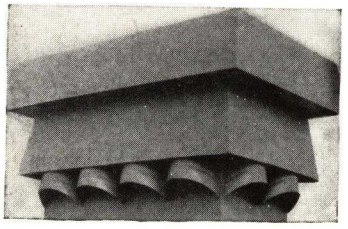
AGENCIES IN PRINCIPAL CITIES

FACTORY AND WAREHOUSE: GARY, IND.

FOR LOUVERS SEE FILE INDEX

AREX-AUSTOR, THE ORIGINAL SIPHONAGE ROOF VENTILATOR

Scientific Design—This ventilator, designed on the original siphonage principle, assures by natural means constant, positive and uniform ventilation. Siphon or vacuo chambers are placed to concentrate all wind currents into a steady pulling force; by means of deflections opposite each siphon, a powerful vacuum is created, drawing out air at a tremendous speed. Foul air, warm air, fumes, gases, vapors, steam and smoke are quickly and completely removed.



Arex Rectangular Ventilator
(Original Siphonage Type)

Arex Rectangular Ventilators are fabricated of all materials and in all sizes; solidly braced and heavily constructed throughout. Absolutely weatherproof and stormproof.

Arex-Austor

DATA, AREX-AUSTOR (ORIGINAL SIPHONAGE) VENTILATORS

Principal dimensions, in.			Exhaust per hour, cu. ft. 11 mile wind	Gauge of ventilators		*Ship. wt., lb.
D	O.W.	O.H.		Galv. iron	Copper oz.	
12	18	24	37,699	24	16	28
14	21	28	51,313	24	18	38
16	24	32	67,021	24	18	54
18	27	36	84,823	24	18	68
20	30	40	104,720	22	18	93
24	36	48	140,796	22	20	130
30	45	60	235,619	22	20	225
36	54	72	339,293	20	24	405
42	63	84	461,813	20	24	475
48	72	96	603,187	20	28	620
54	81	108	763,407	20	32	800
60	90	120	942,477	18-20	36	910
66	99	132	1,140,397	18	36	1170
72	108	144	1,357,167	16-18	44	1450
84	126	168	1,847,256	16	48	2225

*Weights given are for ventilators only.

Construction—Fabricated in one solid unit, no solder used, every joint rigidly riveted. Nothing to get out of order—a ventilator, simple in principle, durable in construction and sure to give year-in and year-out service without attention or repair.

Made of galvanized iron, ingot or toncan metal, cold rolled copper, wrought iron or special metal, any size or gauge. Special bases and pipe connections made to order—submit sketch.

Standard Specifications—All roof ventilators to be Arex original siphonage ventilators as patented and manufactured by the AREX COMPANY, 333 Michigan Avenue Building, Chicago, Ill.

ECONOMY ROOF VENTILATOR AND ECONOMY FAN UNIT

Economy Roof Ventilator—Designed to meet the demand for a ventilator at lowest possible cost, yet capable of solving any ordinary ventilating problem. Manufactured in attractive proportional design of solid sturdy construction. Absolutely guaranteed stormproof. Workmanship (union-made) and materials are of the highest quality. This ventilator is government approved. Materials: Furnished in all standard gauges and in any size. Made of any metal desired, such as galvanized steel, copper bearing steel, cold rolled copper, lead coated copper, aluminum, etc.

Economy Fan Unit—All ventilators can be furnished with fan units having direct connected motors up to and including 36 in. size. Larger sizes are belt driven.

Economy Roof Ventilator

Economy Fan Unit

DATA ECONOMY ROOF VENTILATORS

Sizes, in.	Cu. ft. exhaust 10 mile wind	Galv. ga.	Copper oz.	Shipping wt., lb.
6	4,240	26	16	10
8	7,539	26	16	12
10	11,780	24	16	15
12	16,964	24	16	17
14	23,691	24	16	20
16	30,147	24	16	25
18	38,160	24	16	30
20	47,121	24	18	35
22	58,247	22	18	45
24	67,866	22	18	55
26	80,162	22	20	65
28	92,342	22	20	75
30	106,027	20	20	95
36	152,682	20	24	125
42	207,816	20	28	175
48	271,433	20	28	225
54	343,532	20	32	275
60	424,114	18	36	360

Economy Fan Units can be furnished with or without ventilator. Easily installed in ventilators already in service. Fan units can be furnished in different r.p.m. and hp. to suit requirements.

DATA, ECONOMY FAN UNITS (DIRECT CONNECTED)

Vent size, in.	R.p.m.	C.f.m.	H.p.	Fan dia., in.	No. bla.	Ship. wgt., lb.
10	1700	350	1/50	8	4	7
12	1700	600	1/50	10	4	9
	1400	800	1/30	10	4	9
14	1750	800	1/40	10	4	9
	1140	1000	1/20	12	3	9
16	1750	1600	1/15	14	3	42
	1140	1200	1/20	14	3	42
18	1750	2100	1/6	16	3	43
	1140	1600	1/15	16	3	43
	850	1000	1/20	16	3	43
20	1750	3300	1/6	18	3	62
	1140	2500	1/6	18	3	62
	850	1600	1/12	18	3	62
24	1750	4200	1/4	20	3	82
	1140	3200	1/6	20	3	82
	850	2100	1/10	20	3	82
30	1140	6100	1/4	24	3	105
	850	4600	1/6	24	3	105
36	1140	10600	1/2	30	3	125
	850	7950	1/3	30	3	125

ECONOMY FAN UNITS (BELT DRIVEN)

42	1140	9050	1/2	30	6	280
	850	6030	1/3	30	6	280
48	1140	18100	3/4	36	8	330
	850	13600	3/4	36	8	330
54	850	22500	1	42	8	465
	570	18000	1	42	8	465
60	850	31700	2	48	8	800
	570	25400	2	48	8	800
72	570	37600	3	54	8	950
	490	31400	3	54	8	950

All fan units 16 in. and larger are furnished with access doors.

"K-S-V's" (KERNCHEN SIPHONAGE VENTILATORS)

Construction—The "K-S-V" (Kernchen Siphonage Ventilator) is a troubleproof, lasting investment. Free area of outlet over 200% of pipe area. Nothing to choke or hinder. Friction at minimum, exhaust at maximum. No bearings or pivets; no loose parts to clog up or get out of order; no cost to operate or for maintenance.

Eduction pipe is cylindrical with V-shaped notches or openings at top, each covered by a siphon tapered inwardly toward top, the total of four siphons being covered by a jacket of conical shape, whereby other siphons (four) are formed, greatly increasing the terrific pulling power. In addition, a top construction of two specially designed hoods is used, augmenting considerably the pulling force and making the unit stormproof.

Ventilating Service—Official test of "K-S-V" (Kernchen Siphonage Ventilator) shows that this ventilator will solve ventilating problems at low wind velocity. The "K-S-V" uses all wind energy to ventilate.

Materials—Furnished in all standard gauges and in any size. Prime sheets and union labor used throughout. Made of any metal desired, such as galvanized steel, Keystone copper steel, Armco iron, Toncan metal, cold rolled copper, aluminum, zinc, monel, wrought iron, etc. Furnished with or without base, damper or condensation arrestor.

Specifications

Roof ventilators and bases to be "K-S-V" as manufactured by the KERNCHEN COMPANY, 333 North Michigan Avenue, Chicago, Illinois, in the following sizes (specify sizes by neck diameter and bases, by number, and roof pitch in inches per foot).

Caution — Beware of imitations and infringements; protect yourself by specifying "K-S-V's."

OFFICIAL TEST OF "K-S-V's" (KERNCHEN SIPHONAGE VENTILATORS) CONDUCTED BY ARMOUR INSTITUTE OF TECHNOLOGY, CHICAGO

Showing Exhaust Under Different Wind Velocities, and Which Scientifically Proves the Terrific Pulling Power and 100% to 200% More Efficiency Than That of Ordinary Ventilators

Wind velocity miles per hour	Air pulled through ventilator, lineal ft. per min.	Cubic feet air pulled through ventilator						
		Size of ventilator, in.	12	18	24	30	36	42	48
5	460	Per hr.	21,840	48,852	86,640	135,000	194,820	269,100	346,560
10	670	Per hr.	31,500	71,160	126,180	196,800	283,800	391,980	504,720
15	960	Per hr.	45,240	101,940	180,840	282,000	406,620	561,600	723,360
20	1,220	Per hr.	57,420	129,540	229,800	358,800	516,780	713,700	919,200
25	1,480	Per hr.	69,660	157,140	278,820	435,000	626,880	865,800	1,115,280

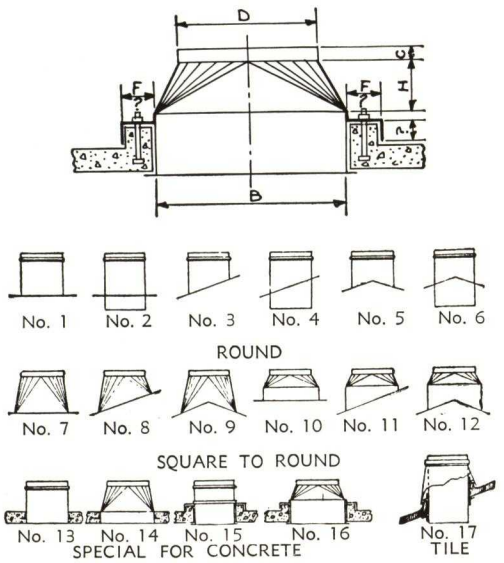
UTILITY ROOF VENTILATOR

The Utility Ventilator is constructed with an extra wide stormband, and has a double area outlet which makes this stationary type ventilator highly efficient. This ventilator is absolutely stormproof, union-made and fabricated of prime sheets throughout. All parts are riveted and no solder is used. Can be equipped with fan unit. Furnished in all standard gauges and in any size. Fabricated of any metal desired.

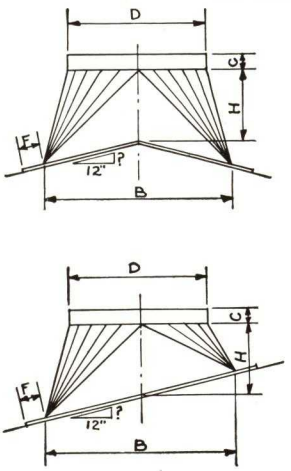
DATA, UTILITY ROOF VENTILATORS

Size, in.	Cu. ft. exhaust 10 mile wind	Galv. ga.	Copper, oz.	Shipping wt., lb.
12	24,964	24	16	26
14	32,690	24	16	30
16	45,140	24	16	36
18	57,060	24	16	45
20	70,121	22	18	53
22	89,757	22	18	65
24	100,856	22	18	80
26	119,747	22	20	95
28	135,419	22	20	110
30	156,027	20	20	145
36	222,682	20	24	185
42	307,816	20	28	250
48	401,433	20	28	330
54	514,532	20	32	410
60	636,114	20	36	540

DATA, AREX-AUSTOR, K-S-V ECONOMY AND UTILITY VENTILATORS



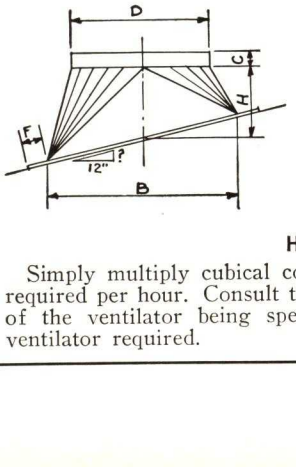
Bases for Standard Installations



DATA, VENTILATOR BASES

Dimensions of bases, in.				Gauge of bases	
B	H	F	C	Galv. iron	Copper, oz.
15 x 15	12	4	3	24	16
17½ x 17½	13	4	3	24	18
20 x 20	14	4	3	24	18
22½ x 22½	15	4	3	24	18
25 x 25	16	4	3	22	18
30 x 30	18	4	3	22	20
37½ x 37½	21	4	3	20	20
45 x 45	24	4	3	20	24
52½ x 52½	27	5	4	20	24
60 x 60	30	5	4	18	28
67½ x 67½	33	5	4	18	32
75 x 75	36	5	4	18	36
82½ x 82½	39	6	5	16	36
90 x 90	42	6	5	16	44
105 x 105	48	6	5	16	48

Shipping weight of bases is approximately one-third of that given for ventilators.



HOW TO ORDER

Simply multiply cubical content of room by number of air changes required per hour. Consult the exhaust capacity column in tabular data of the ventilator being specified and this will indicate the size of ventilator required.

THE ALLEN CORPORATION

Engineers and Builders of Ventilating Appliances

9753 Erwin Avenue, DETROIT, MICH.
SALES ENGINEERS IN ALL PRINCIPAL CITIES

PRODUCTS

ALLEN MULTI-VANE TURBINE VENTILATORS.
ALLEN ELECTRO-WIND TURBINE VENTILATORS.
ALLEN ELECTRIC EXHAUST FANS (direct drive).
ALLEN ATTIC FANS (slow speed—multi-blade).
ALLEN AIR CIRCULATORS (room coolers).
ALCO STATIONARY VENTILATORS.

ENGINEERING SERVICE

Complete layouts and recommendations for equipment best suited to solve air removal problems. Naturally, there is no charge or obligation connected with this service.

ALLEN MULTI-VANE TURBINE VENTILATOR

The Allen Multi-Vane Turbine Ventilator (Patent No. 1,702,120) is the embodiment of the finest in design, workmanship and materials, and represents the experience of a quarter of a century of operations by the manufacturers of the original turbine ventilator as covered by Allen patents dated 1911. Constructed of prime extra "tite-cote" galvanized copper-bearing sheets, die cut and jig fabricated, the Allen Turbine is not to be confused with hand-made imperfect imitations. The interior displacement cone with multi-vanes attached is a patented development exclusive with Allen.

ALLEN ELECTRO-WIND TURBINE VENTILATOR

The Allen Electro-Wind Turbine Ventilator (Patent No. 1,965,171) is a dual purpose exhauster efficiently combining the forces of nature and electricity. This unique ventilator, introduced several years ago, has been refined in design and construction to achieve greater capacity with practically silent operation.

As a wind driven unit, it embodies all the fine performance of the turbine ventilator, originally designed and patented by Allen. When additional exhaust capacity is required, the electric motor, operating through a sturdy free-wheeling clutch, picks up the multi-blade rotor and revolves it at a high rate of speed, more than doubling the exhaust.

EXCLUSIVE FEATURES

(a) Motor not in path of exhaust.
(b) Exhaust unaffected by direction of wind.
(c) Penthouse eliminated.
(d) A powerful positive exhaust at no cost when wind driven.
(e) Low power cost and high efficiency when electrically driven.
(f) No backdraft when power is off.
(g) Low cost per cubic foot of air exhausted.

ALLEN SPECIFICATIONS

When any product achieves the wide acceptance accorded the Allen Multi-Vane Turbine Ventilator, it follows that numerous imitations of various degrees of quality find their way into the market. These imitations ofttimes deceive the purchaser whose architect or engineer has specified Allen products. If you want to be certain that genuine Allen MultiVane Turbines will be installed, adopt the following specification:

"All ventilators to be of the Multi-Vane (or Electro-Wind) Turbine type, constructed of prime sheets of copper-bearing galvanized iron (copper, aluminum or other material). Ventilators shall be equipped with full length interior displacement cones to which shall be attached no less than three compound curve "multi-vanes." All rotor parts to be spot welded and balanced. Rotor to be suspended entirely on ball-bearings and rigidly supported by no less than three exterior supporting arms. Ventilator to be painted inside and outside with two coats of exterior aluminum (or special color) paint. All in accordance with the manufacturing standards of THE ALLEN CORPORATION, Detroit, Michigan."

Allen Multi-Vane Turbine Ventilator
(Interior of Allen Multi-Vane Turbine Ventilator illustrating the displacement cone with Multi-Vanes attached)

RATED DISPLACEMENT CAPACITIES ALLEN TURBINE VENTILATORS

Size, in. (throat diam.)	Free air displacement, cu. ft. per hr. Stack height 20 ft. Temp. diff. 20° F.		
	Wind vel. = 4 m.p.h.	Wind vel. = 8 m.p.h.	Electrically driven
6	9,100	11,100	.....
8	17,300	21,600	.....
10	26,500	32,500	.....
12	38,600	46,200	76,000
15	54,000	69,000	105,000
18	85,200	102,100	170,000
20	105,100	125,600	210,000
24	149,000	185,000	278,500
30	225,000	272,000	420,200
36	281,000	330,000	540,000
42	324,000	414,000	680,000
48	360,000	473,000	780,000

Complete information will be furnished on request.

Allen Electro-Wind Turbine Ventilator
(With motor and speed reduction unit cover cut away)

ESTABLISHED 1909

BABCOCK-DAVIS CORPORATION

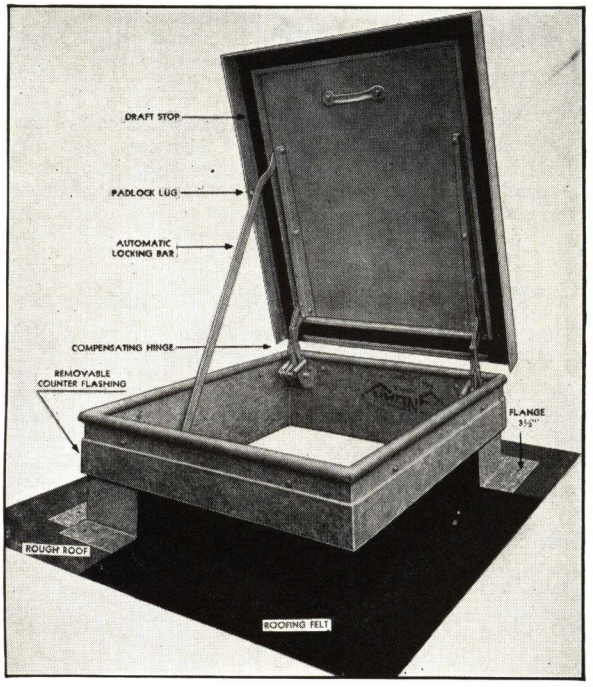
Iron, Steel, Mechanical and Electrical Specialists

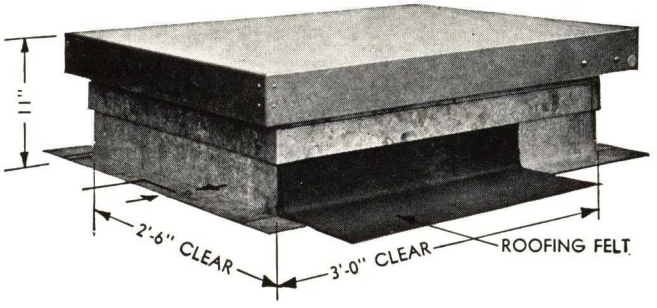
474 Dorchester Avenue, BOSTON, MASS.

For other Babcock-Davis pages, see File Index

B-D EASY ACCESS ROOF HATCHWAY OR SCUTTLE

Pat. No. 2137751, Nov. 12, 1938

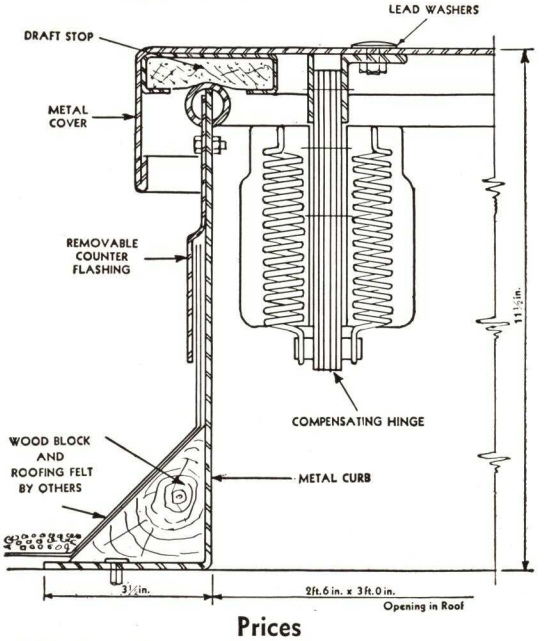




B-D Easy Access Roof Hatchway Covers and Curbs are specified by architects because they answer all requirements for a perfect scuttle. Cover is of aluminum and swings on special compensating hinges which allow it to be raised with practically no exertion on the part of users. When closed, they exert pressure on the draft seal which prevents wind from entering hatch and it can be locked in closed position. Hatch curb is made of galvanized Armco iron, aluminum or bronze. Sides have removable counterflashing strip ready to take either copper flashing or roofing paper, and covers are weatherstripped on all four sides. This weatherstripping has the added advantage of preventing any possibility of galvanic action taking place.

Installation of curb is accomplished by nailing or bolting to roof. Opening made in roof is 2 ft. 6 in. x 3 ft.

Detail of Cover and Curb



Specifications

Furnish and install Standard B-D Easy Access Roof Hatchway on roof opening 2 ft. 6 in. x 3 ft. Cover to be made of aluminum operated with special compensating hinges and equipped with locking bar, hatch curb is to be made of ———, as manufactured by Babcock-Davis Corporation, 474 Dorchester avenue, Boston, Mass.

Prices

The following prices are f.o.b. Boston:

	Price	Weight
Aluminum cover, Armco galvanized iron curb	$ 84.00	134 lbs.
Aluminum cover and curb	111.00	83 lbs.
Aluminum cover, bronze curb	126.00	140 lbs.
Stainless steel cover and curb	157.00	140 lbs.
Armco galvanized iron cover and curb	74.00	155 lbs.

Is Being Used Country Wide—A Few Varied Installations

Pawtucket Institute for Savings, Pawtucket, R. I. *Thomas M. James Co.*
Libby-Owens-Illinois Glass Co., Gas City, Ind. *Austin Co.*
Earle Craig Residence, Beaver, Pa. *W. G. Eckles Co.*
Owens-Illinois Glass Co., Huntington, W. Va. *Hughes-Foulkrode Co.*
St. Thomas School, West Hartford, Conn. *John J. McMahon.*
Central Fire Station, East Chicago, Ind. *Joseph G. Kraft.*
Residence, Palm Beach, Fla. *Treanor & Fatio.*
New Cowles Library, Drake University, Des Moines, Ia. *Proudfoot, Rawson, Brooks & Borg.*
Goodman Furniture Co., Cleveland, O. *Christian, Schwarzenbert & Gaede Co.*
Liebmann Breweries, Brooklyn, N. Y. *Allmendenger & Schlendorf.*
Baldwin Rubber Co., Pontiac, Mich. *L. J. Heenan.*
Citizens Telephone Co., Covington, Ky. *Harry Hake & H. Hake, Jr.*
Irving Savings Bank, New York, N. Y. *Halsey, McCormack & Helmer.*
Hunnewell School, Wellesley, Mass. *J. W. Beals & Son.*
Westinghouse Electric & Mfg. Co., Boston, Mass. *Stone & Webster.*
Shamokin Hospital, Shamokin, Pa.
Grant School, Mason City, Ia.
Flood Protection Pumping Station, Haverhill, Mass. *Metcalf & Eady.*
Registry of Motor Vehicles, Deer Lodge, Montana.
Massachusetts Institute of Technology, Cambridge, Mass. *Coolidge & Carlson.*
Crawford Hall, Grove City College, Grove City, Pa.
Oakdale Avenue School, Lorain, O.
Northport School, Northport, L. I., N. Y.
Merchants National Bank, Allentown, Pa.
108th F. A. Armory, Philadelphia, Pa.
Malden Electric Co., Malden, Mass.
State Teachers College, Kutztown, Pa.
Provident Loan Building, New York, N. Y.
Eldred Hall, Western Reserve University, Cleveland, O.
B. & A. York Street Station, Holyoke, Mass.
St. Vincent's Hospital, Erie, Pa.
Ohio Bell Telephone Building, Kent, O.
Library Building, Connecticut State College, Storrs, Conn.
Infirmary Building, Norwich, Conn.
W.P.A. North Beach Airport, Jackson Heights, L. I., N. Y.

BURT MANUFACTURING COMPANY

Manufacturing Engineers for Roof Ventilation
600 Main Street
AKRON, OHIO

BURT ROOF VENTILATORS FOR EVERY CONDITION

Nation Wide Service

The BURT MANUFACTURING COMPANY has over 75 factory representatives in the principal cities of the United States and Canada. The name and address of your nearest representative will be supplied upon request. He is prepared to assist in solving your ventilation problems—ask him.

Several Types — Good Workmanship

Nearly forty years' experience has definitely proved that no one type of roof ventilator can properly meet all requirements. Accordingly the BURT line consists of several types. Each type is designed and constructed to best meet the work it is to do—using only the best of materials and with workmanship that can be produced only after long experience. Each ventilator is guaranteed against defects in material and workmanship.

Materials

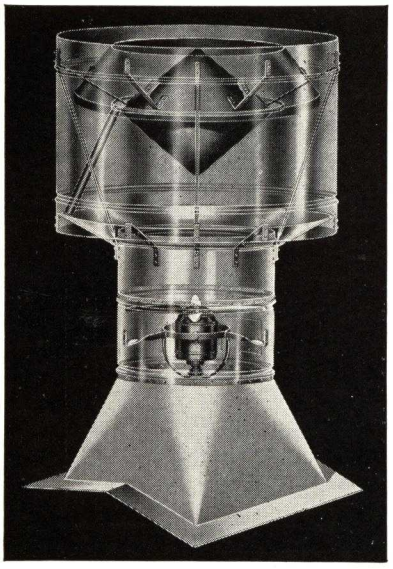
The standard material is high grade, prime open-hearth galvanized steel.

To meet unusual conditions, any Burt ventilator or base may be constructed of any of the following materials.

Copper Bearing Steel	Aluminum
Toncan	Monel
Armco Ingot Iron	Stainless Steel
Cold Rolled Copper	Corten Steel
Lead Coated Copper	Feltcote Asbestos Protected Steel
Zinc	Other Special Metals

See page 4 for description of Felt-Cote, Asbestos Protected Steel, a special surface protected metal, which is recommended for many special uses.

BURT FREE-FLOW FAN VENTILATOR



Efficient Ventilation

The BURT Free Flow Fan Ventilator is completely new-engineered from Burt's experience as originators of the Direct Connected Fan Ventilator. Designed to move the largest possible quantity of air with a given reasonable horsepower input and to serve also as an efficient gravity ventilator when the motor is not in operation.

Features

(1) Free-Flow Head allows unrestricted passage of air with extremely low internal static loss.
(2) Entire discharge vertically upward, away from roof.
(3) Highly efficient as a gravity ventilator.
(4) Motor mountings rigid yet provide for vibration damping.
(5) Fan Barrels in larger sizes equipped with angle rings and stiffners to assure proper alignment.
(6) Fan Wheels especially designed so that constant air delivery is secured with a given horsepower motor in 60 cycle, 25 cycle and D. C. speeds.
(7) Motors totally enclosed, fan duty, ball bearing type rated at 55° C. temperature rise.
(8) Motors available for nearly any power supply in Single Speed; Class 1, Group D Explosion Resisting and Multi-speed types.

Complete Details in Bulletin SPV-10

Dampers

Can be equipped with either Divided Butterfly or Louvre Dampers.

NOTE: There is also available the BURT Standard Fan Ventilator, using the same Fan Barrel and Base as the Free-Flow, but equipped with the Standard Head. Its air deliveries are considerably lower as also is its price. *Complete details are given in Bulletin SPV-11.*

PERFORMANCE AND DIMENSION DATA

Vent Size—Inches**	12	18	24	36	48	60	72	84	96
Fan Diam.—Inches	10.5	16.5	22.5	34.5	46	58	69	81	93
Motor H. P.	1/10	1/8	1/6	1/2	3/4	1.5	3	5	7.5
Motor RPM (60 Cy and DC)	1725	1140	1140	850	675	388	337	282	246
Motor RPM (25 Cycle)	1425	1425	1425	710	710	389	332	285	251
Free Air Delivery—CFM 60 CY, 25 CY and DC	1220	3080	5280	10400	17400	26000	42100	70000	105000
Overall Diam.—Inches	22	32½	43½	64½	85½	108	130	150	171
Overall Height—Inches*	45	62	70	93	111	143	167	183	206
Net Weight—lbs.*	72	127	205	501	884	1741	2649	3729	4880
Shipping Weight—lbs.*	167	259	391	867	1358	2559	3709	4900	6329

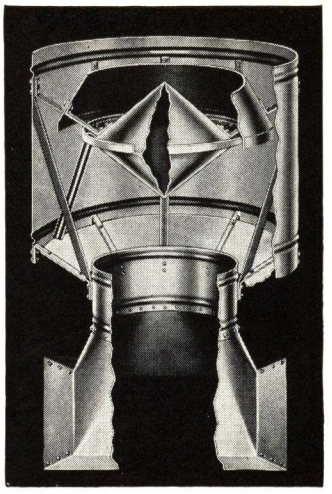
*Including Square to Round Base

**Also made in intermediate sizes: 14, 16, 20, 30, 42, 54, 66 inch

BURT "FREE FLOW" GRAVITY VENTILATOR

Efficient Ventilation

The BURT "Free-Flow Gravity Ventilator is the simplest, most trouble-free type of roof ventilator. It meets the requirement of reasonable price with a ventilator best described as having a "super-capacity".



"Free-Flow" Gravity Ventilator

Features

(1) Upward vertical discharge—(a) Eliminates abrupt changes in direction of air within ventilator head which cause loss of energy and consequently reduction of velocity and discharge. **(b)** Eliminates condensation of moisture on roof directly below ventilator which deteriorates roofing material.

(2) A constantly increasing free discharge area within the ventilator head assures the unrestricted passage of air and more than compensates for what very slight air direction change is present.

(3) The upper airflow baffle, located between the top and windband renders the unit stormproof and effectively prevents any back-drafts, without in any way retarding the air flow.

(4) The lower airflow baffle causes upward flowing wind currents to rise through the ventilator head adjacent to the windband, thereby increasing the siphonage action. Sufficient drain opening is provided between air shaft, and baffle to allow the free passage of all rain, snow or trash.

(5) The airflow director cone eliminates the trap caused by the conventional ventilator top, prevents turbulence in the head, and provides an easy egress for the outflowing air with slight change of direction.

(6) The unusually large windband creates a lower pressure area than is present in most other stationary ventilators, and creates a suction effect which increases the capacity of the unit.

Complete Details in Bulletin SPV-7

Dampers

Accommodates dampers of the Single Disc or Divided Butterfly and the Louvre Type. See page 4 for description of these dampers.

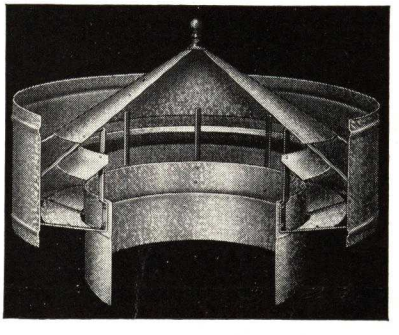
Size, inches	8	10	12	14	16	18	20	24	30	36	42	48	54	60	66	72	84	96
Ga. galv.....	24	24	24	24	24	22	22	22	20	20	20–18	20–18	20–18	18–16	18–16	18–16	18–16	18–16
Oz. copper.....	16	16	16	16	16	18	18	18–16	20–24	20–24	20–24	24–28	28–32	28–32	28–32	32–36	32–36	32–36
Net wt., lbs.....	13	17	26	32	38	60	76	110	173	273	364	479	624	973	1200	1674	2348	2991
Over-all dim., in..	14½	18	22	25½	28½	32½	36	43½	54	64½	75	85½	96½	108	119	130	150	171
Over-all ht., in.*..	16½	18½	25	27	30	36	39	43	51	59	68	75	86	94	102	116	128	144
Cap. c.f.m.**.....	296	464	669	911	1192	1504	1844	2619	4036	5688	7591	9763	11996	14373	17035	19590	24820	29750

*Exclusive of base. **Temperature difference 20° F., stack height, 40 ft., wind velocity 10 m.p.h. Where two gauges are shown, heavier is for air shaft only.

BURT STANDARD GRAVITY VENTILATOR

Efficient Ventilation

The BURT Standard Gravity Ventilator is a moderately priced unit built to the BURT quality standards and with a capacity which, while not quite as high as the "Free-Flow", is still higher than would normally be expected.



Standard Gravity Ventilator

Features

(1) Protected free outlet area in excess of 150% of the air shaft area assures an unrestricted passage through the ventilator head.

(2) The exclusive Burt Inverted Lower Louvre efficiently directs any upward flowing air currents through the ventilator head, thereby increasing its siphonage action and preventing back-drafts.

(3) The generous overhang of the ventilator top assures stormproofness.

(4) An amply proportioned windband assures a large suction area and consequently excellent air moving capacities.

(5) Internal bracing is more than sufficient to render the unit entirely rigid under any possible condition of wind or snow loading. Braces in galvanized ventilators are made from galvanized band iron.

(6) Copper construction is copper *throughout*—using solid copper busbar braces and rivets. All exposed raw edges are well hemmed.

(7) Aluminum construction is likewise entirely from aluminum—sheets, braces and rivets.

(8) When construction employs asbestos protected steel, all cut edges are taped and hot rolled in an especially developed compound. Braces are also compound treated. All bolt and rivet heads, upon completion, are coated with a special asbestos paint.

Complete Details in Bulletin SPV-8

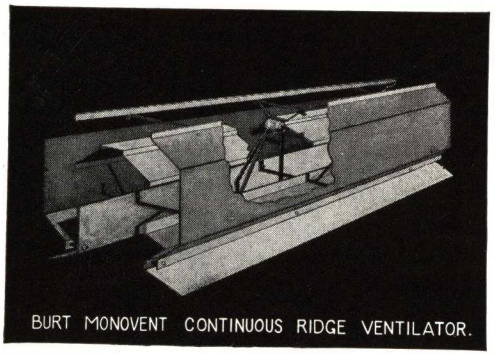
Dampers

The Standard Gravity Ventilator accommodates four types of dampers. When equipped with a Sliding Cone Damper and fusible link it becomes a fire-retarding unit, approved by the Underwriters' Laboratories, Inc. The Sliding Sleeve offers an automatic opening damper. Butterfly and Round Louvre Dampers are also furnished. See page 4 for description of these dampers.

Size, inches	8	10	12	14	16	18	20	24	30	36	42	48	54	60	66	72	84	96
Ga. galv.....	24	24	24	24	24	22	22	23	20	20	20	20	20	18	18	18–16	18–16	18–16
Oz. copper.....	16	16	16	16	16	18	18	18	20	20	20	20	24	24	24	32–34	32–34	32–34
Net wt., lbs.....	7	9	12	15	18	23	28	39	69	97	148	205	263	388	464	610	837	1053
Over-all diam., in..	14½	16½	20½	23½	26	30½	31½	38	47	57	66½	76	85	95	105	114	133	152
Over-all ht., in.*..	12	14½	18½	19½	21	25½	26	31	36½	40	47	55	57½	65	68½	75	85	99
Cap., c.f.m.**.....	207	323	465	625	821	1035	1260	1800	2760	3860	5125	6466	7831	9297	10880	12540	16390	20820

*Exclusive of base. **Temperature difference 20° F., stack height, 40 ft., wind velocity 10 m.p.h. Where two gauges are shown, heavier is for air shaft only.

BURT MONOVENT CONTINUOUS RIDGE VENTILATOR



BURT MONOVENT CONTINUOUS RIDGE VENTILATOR.

Efficient Ventilation

Knowing that a great part of the time a wind will be blowing across the ridge, the Monovent Continuous Ridge Ventilator has been designed so that the windband and inner baffles will take advantage of the wind effect. As the tables are based only on stack action, however, the ratings are exceedingly conservative.

Suitable for All Types of Construction

Designed primarily for ridge installation, its simple construction is adaptable to a roof of any pitch. It can also be applied to slopes, decks and to built-up curbs with the same ease and speed of installation.

Vent sizes, inches*		4	6	9	12	18	24
Ga. galv. / Oz. Copper		24 / 16	24 / 16	24 / 16	22 / 18	20 / 18	18 / 20
Dimensions, inches	A	4	6	9	12	18	24
	B	8¾	13¼	19½	26	36¾	46½
	C	5½	7½	10	12	18½	23¼
	D	8¾	12¼	16¼	21	30⅛	36½
Net wt., lbs. per 10 ft.	Galv.	60	91	124	188	330	497
	Copper	54	83	103	160	249	328
Ship'g. wt., lbs. per 10 ft.	Galv.	106	142	195	280	440	631
	Copper	100	134	174	252	359	462
Temp. diff., deg. F.	Stack ht. feet	Capacity per 10-ft. section, c.f.m.					
10	10	478	725	1090	1450	2180	2900
	20	677	1025	1538	2050	3075	4100
	30	828	1250	1880	2510	3760	5020
	40	957	1450	2170	2900	4350	5800
	50	1080	1625	2440	3250	4880	6500
20	10	677	1025	1538	2050	3075	4100
	20	957	1450	2170	2900	4350	5800
	30	1172	1775	2660	3550	5320	7100
	40	1360	2050	3070	4100	6140	8200
	50	1530	2300	3430	4580	6860	9160
30	10	828	1250	1880	2510	3760	5020
	20	1172	1775	2660	3550	5320	7100
	30	1436	2180	3260	4350	6520	8700
	40	1657	2510	3760	5020	7530	10040
	50	1855	2800	4210	5620	8420	11240
40	10	957	1450	2170	2900	4350	5800
	20	1360	2030	3070	4100	6140	8200
	30	1657	2510	3760	5020	7530	10040
	40	1914	2900	4350	5800	8700	11600
	50	2140	3240	4860	6480	9720	12960

*Built in larger sizes on special order. Data supplied on request.

Features

(1) Harmonizes architecturally with the building design.

(2) Avoids the broken roof line of the unit type ventilator.

(3) Provides a large protected outlet area and offers the least possible restriction to the natural flow of air through it.

(4) No pockets or traps to cause air turbulence and restrict capacity.

(5) Constructed in 10-ft. sections; each section is absolutely uniform, avoiding the necessity of identifying marks for erection purposes.

(6) The ends of sections are so constructed that sections fit together uniformly without alteration in the field. End fittings are universal and fit either end of section without any drilling.

(7) Engineers have endorsed Monovent design as efficient, strong and practical. Architects have accepted and approved the Monovent from the standpoint of appearance and its adaptability.

Complete Details in Bulletin SPV-6

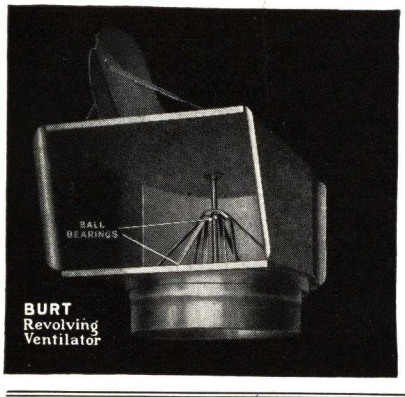
Dampers

The Monovent is equipped with a simple, troubleproof damper. The operating sections are separated by damper junction baffles which are installed quickly and easily without any changes in the ventilator construction.

Damper connecting bars are uniform in length in each 10-ft. section causing no erection difficulties due to mixing sections.

When an operating damper is not required, the damper is riveted in the full open position, becoming a fixed top.

BURT BALL BEARING REVOLVING VENTILATOR



Efficient Ventilation

The BURT Ball Bearing Revolving Ventilator is a reasonably priced unit in which normal stack action is greatly supplemented by wind action resulting in exceptionally high air movement capacity.

Features

(1) Finely balanced thus eliminating friction.
(2) Equipped with two sets of ball bearings (or two sets of Timken roller bearings) which gives positive assurance of free turning.
(3) A patented open back acts as a stabilizer in eddying winds.
(4) Has a large top overhang to assure stormproofness even in driving gales.
(5) The large outlet opening provides an unrestricted air passage.
(6) Strong head support tube and braces are sufficient to withstand great wind pressures.

Complete Details in Bulletin SPV-9.

Size, inches	8	10	12	14	16	18	20	24	30	36	48	60
Ga. galv.	22	22	22	22	22	20	20	20	18	18	18	16
Oz. copper	16	16	16	16	16	18	18	18	20	24	24	28
Net wt., lbs.	7	8	24	34	46	51	60	81	132	178	387	642
Over-all lgth., in.	18¼	23½	28¼	30¾	35	40½	43¼	49½	56½	61½	89	110
Over-all ht., in.	20	25	30½	34½	35	36	38½	44	54	52¼	74¼	90½
Cap., c.f.m.*	242	372	546	735	965	1207	1465	2071	3116	4218	6603	8797

*Temperature difference 20° F. Stack height 40 ft. Wind velocity, 10 m.p.h.

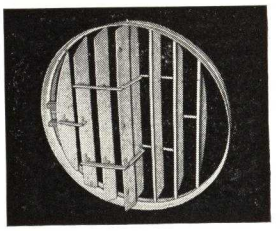
Dampers

Two types are available; the Butterfly and Louvre. Either is installed in the ventilator air shaft below the head supporting members, assuring full operation of damper control cables.

BURT VENTILATOR DAMPERS AND DAMPER CONTROL

Louvre Dampers

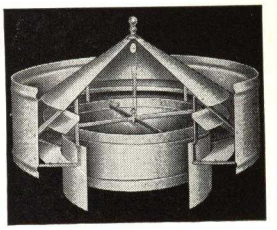
Louvre dampers provide the finest possible control of air flow. They offer but small air resistance and in partially open position create but little turbulence. Their compactness allows their use in any type of BURT ventilator. Can be controlled by hand chain, roof quadrant or by damper motor.



Louvre Damper

Sleeve Dampers

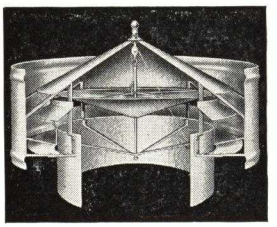
Sliding sleeve dampers are close fitting, occupy almost no space in the air shaft and cause no turbulence in any position. Furnished on Standard Gravity Ventilators only. Operates by hand chain which can be equipped with a fusible link.



Sleeve Damper

Sliding Cone Dampers

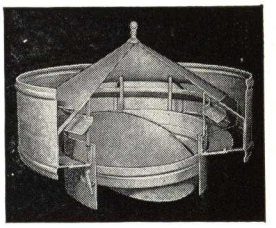
This type damper directs the air stream to the outlet openings, lessening turbulence and increases capacity. Controlled by hand chain only and can be used on Standard Fan and Standard Gravity Ventilators. When used with a fusible link, it is approved by the Underwriters' Laboratories, Inc.



Sliding Cone Damper

Single Disc Dampers

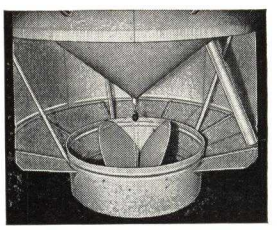
A simple type damper consisting of centrally pivoted disc for Standard and Free-Flow Gravity Ventilators up to sizes as large as it is possible to swing them. Normally operated by hand but can be controlled by damper motor. Can be furnished in asbestos protected steel.



Single Disc Butterfly Damper

Divided Butterfly Dampers

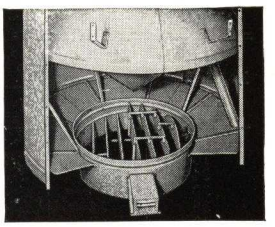
These are used in sizes which prevent the use of the single disc due to interference in the ventilator head or base. Both wings are operated by a single hand chain. Can be furnished in asbestos protected steel.



Divided Butterfly Damper

Damper Control Motors

May be either of the electric or compressed air type. Are housed in a ventilated but weathertight housing outside the ventilator air shaft. When used with fan ventilators, the control can be interconnected with the fan motor.



Damper Control Motor

Complete Details of all Dampers in Bulletin SPV-14

BURT VENTILATOR BASES

Heavy Gauge Metal—All Burt Ventilator Bases are substantially made using a thickness of metal sufficient not only to carry the weight of the ventilator but to also withstand severe strains due to wind and snow loads.

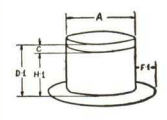
Condensate Gutter—A condensate gutter placed around the perimeter is available when specified. These drain to the roof outside the ventilator all moisture which may condense in the ventilator head or air shaft.

Roof Flange—The mounting roof flange is made sufficiently wide to insure rigid mounting and a weathertight joint.

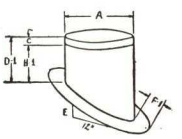
Special Bases—The sketches show only standard type base but high quality can be built into bases to any specifications and dimensions for any size or shape of roof.

Complete Details of all Bases in Bulletin SPV-15

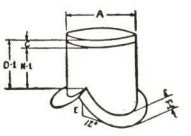
BURT STANDARD VENTILATOR BASES.



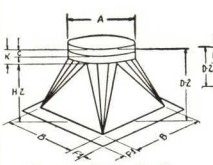
ROUND BASE FLAT
FIGURE-1



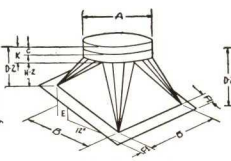
ROUND BASE - SLOPE
FIGURE-2



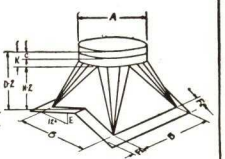
ROUND BASE - RIDGE
FIGURE-3



SQUARE BASE FLAT
FIGURE-4



SQUARE BASE - SLOPE
FIGURE-5

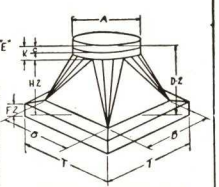


SQUARE BASE - RIDGE
FIGURE-6

-NOTES-

"E" DIMENSION REPRESENTS SLOPE OF ROOF. SPECIFY WHEN ORDERING "D","Z" & "T" DIMENSIONS TO BE SPECIFIED WHEN ORDERING CURB TYPE. DIMENSIONS H-1 & H-2 ARE APPROXIMATE. WILL VARY WITH ROOF PITCH ORDER BASES BY FIGURE NUMBER AS SHOWN ABOVE AND GIVE DIMENSION "E" THIS ESTABLISHES THE TYPE BASE REQUIRED. THE PITCH OF THE ROOF - AND WHETHER FOR SLOPE, OR RIDGE
SPECIAL BASES OF OTHER STYLES OR DIMENSIONS CAN BE FURNISHED.

DIMENSIONS IN INCHES										METAL GAUGES		ROUND BASE			SQUARE BASE			
A	B	C	D-1	DZ	F1	F2	H1	H2	K	GALV	OZ PER SQ FT GALV	NET WT COPR	GALV	SHIP WT COPR	NET WT. GALV	COPR	SHIP WT. GALV	COPR
8	12	1	7	7	4	3	6	6		22	16	24	5	4	17	16	8	6	18	16
10	14	1	7	8	4	3	6	7		22	16	24	6	4	19	17	10	7	20	18
12	16	1	7	9	4	3	6	8		22	16	24	7	5	21	19	12	9	23	20
14	18	1	8½	10	4	3	7½	9		22	16	24	9	7	25	22	15	11	26	22
16	20	1	8½	11	4	3	7½	10		22	16	24	11	8	26	24	17	13	29	25
18	22	1	8½	11½	4	3	7½	10½		20	18	22	14	10	30	26	23	16	35	28
20	24	1¼	8½	12½	5	3	7½	11		20	20	22	17	13	35	32	30	23	43	39
24	30	1¼	8½	12½	5	3	7½	11½		20	20	22	21	16	40	35	37	28	50	42
30	36	1½	11½	17	5	4	10½	12	5	18	24	20	39	27	59	49	62	43	73	57
36	42	1½	11½	17½	6	4	10	12½	5	18	24	20	52	36	65	59	81	54	95	74
42	48	1½	11½	18	6	4	10	13	5	18	24	18	63	44	90	74	98	68	117	92
48	54	1½	14½	19	6	4	13	14	5	18	28	18	80	65	144	127	117	94	157	132
54	60	2	14½	20	6	4	12½	15	5	16	32	18	95	88	160	149	152	141	202	192
60	66	2	14½	21	6	4	12½	16	5	16	32	16	135	103	220	190	214	162	303	260
66	72	2	14½	22	6	4	12½	17	5	16	32	16	155	117	235	205	249	193	341	294
72	78	2	17½	23	6	4	15½	18	5	16	36	17	264	233	371	347	350	310	472	447
84	90	2	17½	24	9	4	15½	19	5	16	36	17	341	300	462	433	463	407	687	641
96	102	2	17½	25	9	4	15½	20	5	16	36	17	430	380	541	508	583	516	823	755



SQUARE BASE - CURB
FIGURE-7

-NOTES-

"C" EQUALS OVERALL HEIGHT OF COLLAR
"C" EQUALS LAP DIMENSION
BASES SIZES 72" TO 96" INCLUSIVE ARE EQUIPPED WITH ANGLE RINGS AT UPPER EDGE OF COLLAR.

VERTICAL STIFFENER ANGLES ON BASES ARE FURNISHED AS STANDARD EQUIPMENT WITH,
A-STD GRAVITY VENTS. 72" TO 96" SIZES INC.
B-FREE FLOW VENTS. 54" TO 96" SIZES INC.
C-FAN VENTS 48" TO 96" SIZES INC.

THE BURT MANUFACTURING COMPANY
AKRON-OHIO
DWG. Nº B-100-B

SUPERSEDES DWG. Nº B-100-A

BURT VENTILATORS AND BASES OF FELT-COTE

Felt-Cote Asbestos Protected Steel is constructed of steel sheets to which long fibered asbestos felt has been applied by use of hot asphalt. The felt is then weatherproofed by a special compound applied at the factory and a final outside coat of bituminous fibrated composition.

Felt-Cote ventilators and bases are especially recommended in all cases where severe corrosive conditions are present.

Where this material is used great precaution is taken during manufacture to see that all edges are sealed so that there is no exposed metal. Seams, rivet and bolt heads are thoroughly compounded after fabrication.

25J

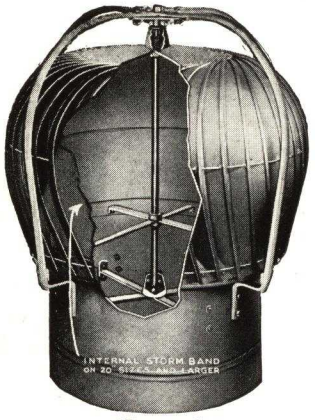
CENTURY FAN & VENTILATOR COMPANY

FACTORY
STAMFORD, CONN.

SALES OFFICE
312 East 39th Street
NEW YORK, N. Y.

HIGH GRADE GRAVITY AND POWER ROOF VENTILATORS AT LOW COST

Dampers Furnished to Operate by Chain, Pneumatic or Electrical Control When Required



(Patented)

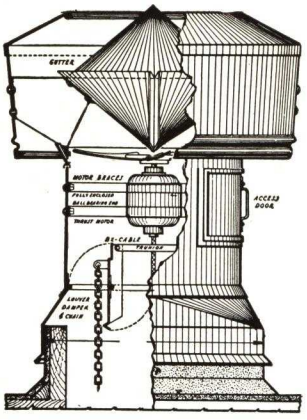
Century Turbine Rotary Ball Bearing Ventilator

The Century Turbine Rotary Ball Bearing Ventilator is the most constant exhauster for general purposes as it rotates with a one-mile wind and exhausts air while other types are idle. The bearings are designed for high speed, silent rotation.

The Century Turbine is symmetrical in design and low in height. It is usually specified for schools and similar buildings because of its very pleasing appearance. Twenty-inch sizes and larger are equipped with internal baffle or storm band for absolute weatherproofness.

Made in all sizes from 6 to 60-in. diameter.

Neck diam., in.	Over-all, in.		Gauge, galvanized painted	Oz. copper	Exhaust cap. 5-mile wind 20° temp. diff. c.f.m.
	Width	Height			
12	20	17	28 and 22	16 and 20	650
18	28	23	28 and 22	16 and 20	1450
24	38	32	28 and 22	16 and 24	2150
30	48	38	24 and 20	16 and 24	3400
36	54	42	24 and 20	18 and 24	4250
42	60	51	24 and 20	18 and 24	4900
48	66	58	24 and 20	18 and 24	5500



Century Fan Ventilator

A combination power and gravity ventilator. When motor is off, ventilates by gravity. This unit is ideal for industrial buildings and conditions requiring mechanical ventilation; or where a large volume of exhaust is occasionally required. Motors are fully enclosed, ball bearing and specially designed for this application. Equipped with the most efficient type of cast aluminum fan.

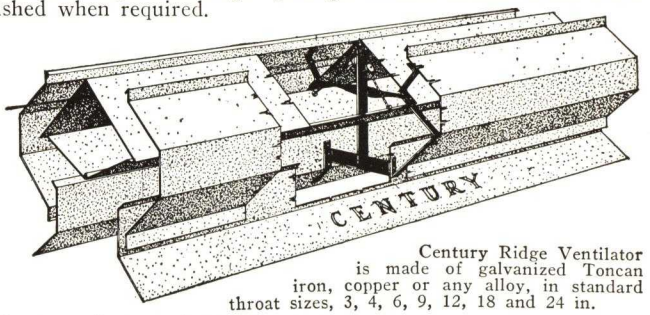
Stack diam., in.	Fan speed, r.p.m.	Hp.	Exhaust capacity c.f.m.			Over-all, in.		Height without base	
			1/8 in. s.p.	1/4 in. s.p.	3/8 in. s.p.	Width	Height without base	Gauge, galvanized	Oz. copper
12	1750 1160	1/20	800 600	400 200		20	24	24	16
14	1160	1/20	800	500	300	24	18	24	16
18	1750 1160 860	1/4 1/6 1/20	2900 2000 1300	2000 1400 1000	1150 800 600	29	18	22	18
20	1160 860	1/6 1/8	2900 2200	1800 1400	1000 800	36	26	22	20
24	1160 860	1/4 1/4	4100 3300	3000 1800	2000 1200	40	30	22	20
30	1140 860 690	1/2 1/4 1/4	6200 4200 4000	4500 3700 3400	3000 2600 2400	46	36	22	24
36	860 690	1/2 1/2	7800 6700	6200 5000	5300 3900	54	38	20	24

Century Ridge Ventilator

Made in rigid 10-ft. sections and installed in one continuous length. Ventilation of large areas is efficiently accomplished with the Century Ridge Ventilator as entire ridge of roof can be opened, preventing accumulation of heat and fumes.

The inverted cone eliminates pockets and directs flow of air continuously upward with the least possible resistance. The inverted cone also serves as shut-off damper which completely closes roof opening by releasing damper cable.

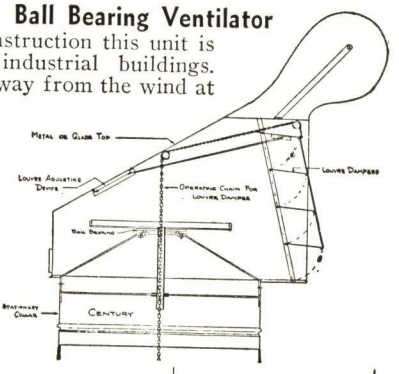
Entire unit is designed to prevent snow, dirt or leaves from accumulating in drainage openings. Bird or insect screen furnished when required.



Century Ridge Ventilator is made of galvanized Toncan iron, copper or any alloy, in standard throat sizes, 3, 4, 6, 9, 12, 18 and 24 in.

Century Rotary Syphon Ball Bearing Ventilator

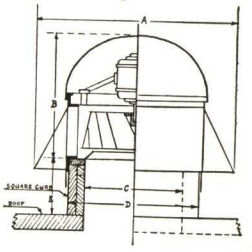
Of unusually heavy construction this unit is particularly suited for industrial buildings. The entire stack area is away from the wind at all times and the air is exhausted with the least possible resistance. The Century Rotary Syphon is equipped with the finest precision oversized bearings which last indefinitely and require no attention or relubrication. Equipped with adjustable louvers.



Century Cyclone Fan

Century Cyclone Fan is constructed of galvanized iron or copper over angle iron framework. Permits a free flow or air and is absolutely weatherproof.

Century Cyclone is a positive centrifugal fan with self-limiting horsepower characteristics. Will not overload motor regardless of static resistance.



Fan size	R.p.m.	Hp.	Free air	1/8 in. SP	1/4 in. SP	3/8 in. SP	1/2 in. SP
13	1150	1/20	800	725	575	460	
16	1150	1/8	1400	1300	1175	950	
	860	1/8	1000	875	750		
19	860	1/4	2000	1800	1575	1000	
22	860	1/4	3300	3150	2950	2700	2000
	690	1/6	2800	2600	2300	1300	
25	860	1/2	5000	4600	4300	4000	3700
	690	1/3	4000	3500	3200	2600	
28	690	1/2	5200	5000	4700	4300	3500
	575	1/3	4400	4100	3600	2400	
31	575	1/2	6000	5600	5200	4800	4000
	480	1/3	5000	3900	3800	2800	2500
34	575	3/4	7800	7600	7200	6500	5500
	480	1/2	6600	6200	5600	4000	
37	480	3/4	8600	8200	7500	6500	
	425	1/2	7600	7000	6200	3650	
43	425	1	11800	11200	10300	9500	
	380	3/4	10500	10000	9200	6700	
50	380	1 1/2	15800	15200	14300	13000	
56	380	2	22000	21500	20000	19400	

Belt drive for speeds less than 860 r.p.m.

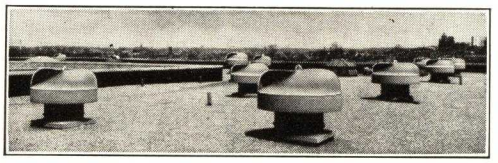
Roof Ventilators and Auxiliary Equipment

Architects Manual JV

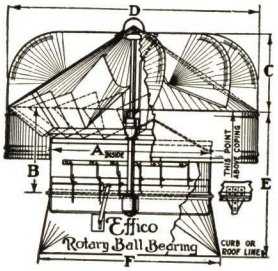
W. F. Hirschman Co. Inc.
BUFFALO
N.Y.

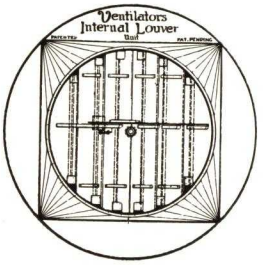
EFFICO INTERNAL LOUVER UNIT VENTILATOR

Containing Circular Louver Damper, For Thermostatic Control

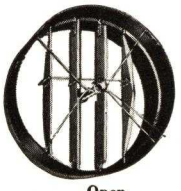


Typical Effico Louver Unit Installation





Effico Internal Louver Unit Ventilator Patented



Open

Closed

Multiple Circular Louver Damper in Neck of Ventilator

EFFICO INTERNAL LOUVER UNIT VENTILATOR DIMENSIONS AND CAPACITIES

Guaranteed and Conservative

Dimensions in inches						Ga. Gal.		Net weight lb.	Oz. Copper		Cubic feet of air exhausted per minute 5 MPH. Wind velocity				Telegraph Code Gal. Toncan Vents
											Temperature difference in degrees Fahr. in building and outside				
A	B	C	D	E	F	Cowl	Neck & base		Cowl	Neck & base	0	10	20	30	
12	11	8	21 3/32	23	..	24	24	....	14	14	350	440	515	560	Veil
18	11 1/32	10	28 1/32	23	22	24	24	90	16	18	600	850	950	1040	Vale
24	16	14	40	26	30	24	22	140	18	20	1020	1600	1780	1900	Valet
30	22	14	50	28	36	24	20	190	20	20	1560	2300	2690	2900	Vive
36	24	18	60	30	42	22	18	225	24	24	2300	3400	3810	4100	Varve
42	33	22	68	38	48	22	18	350	24	24	3150	4500	5010	5500	Vetch
48	34	24	76	38	54	22	18	400	24	24	4000	5900	6700	7400	Vax
54	35	24	86	38	60	22	18	600	24	24	5100	7300	8450	9500	Vaid
60	37	24	98	38	66	20	18	710	24	24	6500	9300	10600	11900	Valor
66	43	30	103 1/32	44	72	20	18	800	24	24	8100	11200	12250	13400	Vamp
72	50	30	114	48	80	20	18	880	24	32	9800	13500	14600	16000	Vane
84	54	40	130	48	92	18	16	1050	24	32	12500	18000	21000	23000	Vang

For round bases, "E" dimension remains the same. Dimensions "C" should be above coping.

The Effico Internal Louver Unit

This comprises the Effico Rotary Ball Bearing Ventilator head constructed with a special short base, and neck. In the base is built a circular multiple blade Louver damper. The damper is carefully balanced and heavily constructed of stretcher leveled sheets. The blades lap and are fitted in a circular frame. It is adaptable for manual control, but is intended for a thermostatic control-system. The roof base is very low and is a part of the Unit. It is supplied in either the square or round type.

Damper Control

Hirschman Electric Damper Control or air diaphragm motor can be installed by us before shipment.

Each ventilator neck has also a tight fitting door to give free access to the Louvers and to the operating motor. The object of the specially low base and the low roof base is to make the entire Unit as low on the roof as possible.

Low Height Construction

The Effico Rotary Ball Bearing Ventilator head is already lower in height by 50% than any other rotary type of ventilator. By using the construction as outlined above, the entire Unit is brought as low to the roof as is permissable to still allow the air free exhausting, and to maintain the outlets above the snowline. By adopting the circular multiple louvers, of which we are the inventors, we can standardize on sizes and build the round louver for considerably less than the square or rectangular styles.

By installing same in the neck of the ventilator at our shop, we not only give a perfect fit, but also eliminate all indefiniteness as to the correct location and size of the damper and cut the installing cost at least 80%. It is also easier to install the operating motor and makes it more accessible. The size of the damper is the full size of the stack, and yet it is about 40% smaller in area than those heretofore used in the square or rectangular damper, again reducing the cost considerably.

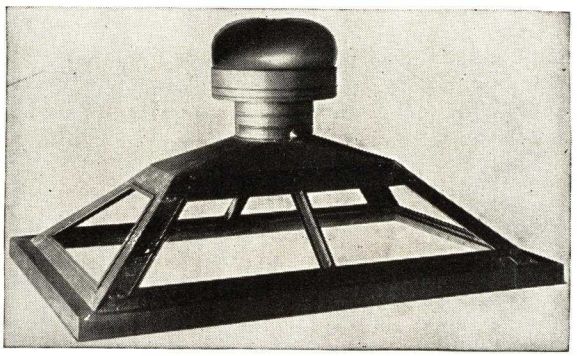
Advantage of a Complete Unit

By supplying the contractor with the complete EFFICO INTERNAL LOUVER UNIT VENTILATOR the builder is assured of a well designed, uniform and complete Unit.

Heretofore, the contractor purchased the ventilator from one manufacturer, probably built the roof base himself, and purchased the dampers elsewhere, or even the dampers were supplied and installed by another contractor. This added materially to the cost.

Specifications on page 11.

EFFICO SKYLIGHT VENTILATOR BASE



Puttyless Construction

The Effico Skylight Ventilator Bases have a glass area which is at least equivalent to their roof area. "Rain in" and "blow in" are entirely eliminated. There is no swinging sash to operate, and the ventilation is perfect, serving the dual purpose of giving real ventilation and allowing daylight into the building, one opening in the roof serving both purposes.

Standard Skylight Curb Dimensions—3x3 ft.; 3x4 ft.; 3x6 ft.; 4x4 ft.; 4x6 ft.; 4x8 ft.; 4x10 ft.; 6x6 ft.; 6x8 ft.; 6x10 ft.; 6x12 ft.

Application—Any Hirschman Company Ventilator can be fitted to our Skylight Base.

Specifications on page 11.

EFFICO ROTARY BALL-BEARING VENTILATOR

Wind Driven — High Capacity in Low Winds

Construction and Principle of Operation

The Effico rotating cowl exterior is covered by wind propelled blades; interior by suction blades. There are no moving parts. Effico shaft rotates on ball bearings, fitted with clock precision in solidly enclosed dust-tight and oil-tight housings, and is flooded in inches of non-freezing oil (furnished by us); no oiling is required for years (proven), but we oil-flood them as an extra precaution. The Effico is absolutely noiseless. No drip pans or bird screens are needed.

Great Air Volume Exhaust at Low Wind

All Efficos will draw considerable air at a 1-mile breeze (an apparent calm) without stack or heat assistance. The 30-in. size will rotate (standing start) at a ½-mile breeze. Cowl outlet is over 50% larger than its stack area, which is ample, as no wind enters ventilator to gain the so-called siphonage effect. Suction fan is same size as rotating cowl (note dimension chart). Thus each Effico is equipped with fan over 50% greater in diameter than its stack area. Fan pulls air up stack at even the slowest turning movement and wind blowing across the outlet adds to its efficiency.

The wind has the same syphonage effect on the Effico as on ventilators depending on spyhonage only.

The combination of the carefully designed fan, perfectly made bearings, and the wind-syphonage principles has resulted in the highly efficient Effico.

During high winds, namely, fifteen miles and over, the Effico remains constant, and will not exhaust unreasonable volumes of air which endangers the equilibrium of the ventilating system.

Percentage of Constancy

With United States Weather Bureau reports as a basis, and their findings that the wind at line of ventilators (over roof) is three miles slower than the tower records, shows the Effico Wind-Driven Head during July and August to be 96% constant in New York City, Philadelphia, Boston, Buffalo, Cleveland, Detroit, Galveston, Kansas City, San Francisco, Chicago, Jacksonville, 90% constant in Columbus, Toronto, Louisville, St. Louis; 80% constant in New Orleans, Milwaukee, Cincinnati and Baltimore.

Symmetry

The Effico has artistic lines and pleasing appearance. Lowest in height of rotary ventilators by over 50% average. Note dimension chart.

Cost

Effico Ventilators exhaust more air per-dollar-cost of installation. The wind (only) driven heads exhaust greater volumes and during lower winds, thus a greater capacity within a given period. Effico Wind-Electrics, of course, are 100% constant. See page 3 of our catalogue.

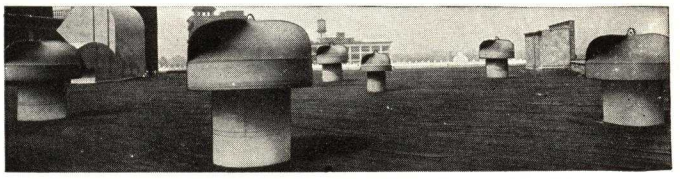
CAPACITIES OF EFFICO ROTARY BALL BEARING VENTILATORS

Guaranteed and Conservative
Cubic Feet of Air Exhausted Per Minute

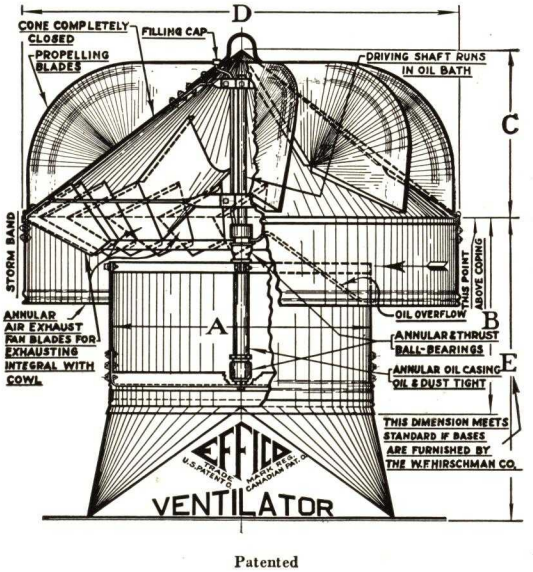
Wind velocity, miles per hour	Temperature difference in degrees Fahrenheit in building and outside											
	0	10	20	30	0	10	20	30	0	10	20	30
	12-in. Ventilator				18-in. Ventilator				24-in. Ventilator			
5	350	440	515	560	600	850	950	1040	1020	1600	1780	1900
10	430	525	600	625	910	1050	1200	1300	1490	1900	2100	2300
	30-in. Ventilator				36-in. Ventilator				42-in. Ventilator			
5	1560	2300	2690	2900	2300	3400	3810	4100	3150	4500	5010	5500
10	2300	3210	3490	3600	3250	4200	4720	5050	4390	5700	6300	6800
	48-in. Ventilator				54-in. Ventilator				60-in. Ventilator			
5	4000	5900	6700	7400	5100	7300	8450	9500	6500	9300	10600	11900
10	5900	7900	8900	9050	7850	9900	11000	11500	9200	12500	14000	14500
	72-in. Ventilator				84-in. Ventilator				96-in. Ventilator			
5	9800	13500	14600	16000	12500	18000	21000	23000	16000	22500	27000	29000
10	13000	17000	19000	20000	18000	24000	27000	28000	22800	30000	33500	35500

ELECTRIC DAMPER CONTROL

Where required, our Hirschman Electric Remote Control Damper device can be supplied with any Hirschman Ventilator. See page 10.



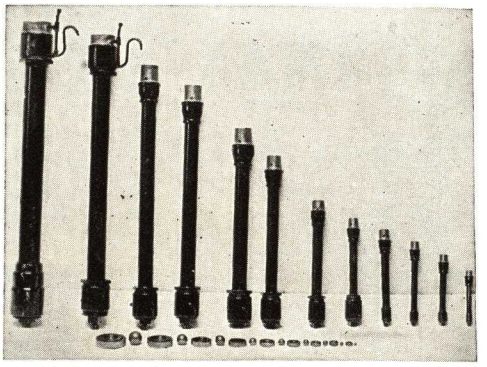
Effico Rotary Ball-Bearing Ventilator Installation



Patented

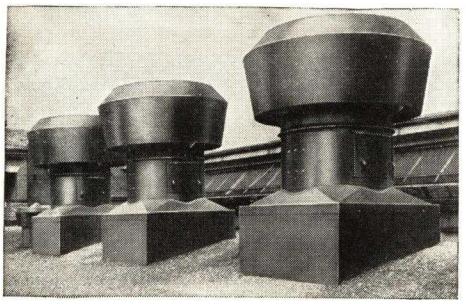
EFFICO STANDARDIZED VENTILATORS

Dimensions in inches					Galvanized Steel Gauge			Copper, oz.		Telegraph code, gal. toncan vents
A	B	C	D	E	Cowl	Neck and Base	Net weight, lb.	Cowl	Neck and Base	
6	9	9	13	....	26	26	10	14	14	scheck
10	9	9	16	....	26	26	18	14	14	sachem
12	11	8	21¾	23	24	24	25	14	14	scene
18	11½	10	28½	24	24	24	38	16	16	saturn
24	16	14	42	26	24	22	95	16	18	shake
30	22	14	52	28	22	20	140	16	20	sank
36	24	18	62	30	22	18	180	18	24	sargeant
42	33	22	68	39	22	18	300	18	24	serpent
48	34	24	74	40	22	18	370	18	24	serve
54	35	24	86	41	22	18	525	20	24	sham
60	37	24	98	43	20	18	650	20	24	shawl
66	43	30	103½	49	20	18	700	20	32	sunk
72	50	30	114	56	20	18	750	20	32	shop
84	54	40	130	60	18	16	900	24	32	slave
96	54	45	153	60	18	16	1025	24	32	shekel



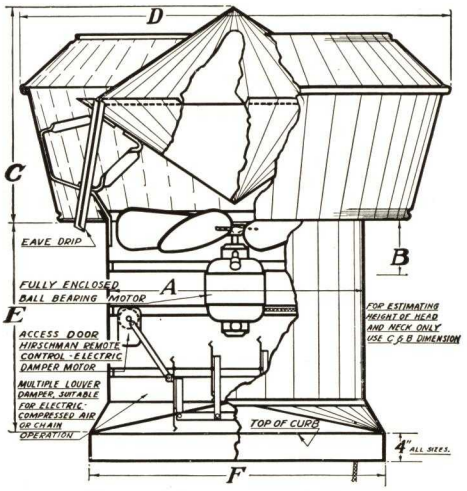
Effico Oil Flooded Dust and Acid Proof Bearing Housings

HIRSCHMAN F (Fan) VENTILATOR NON-AUTOMATIC



Philadelphia Electric Transformer Station.

Three 48" Hirschman "F" Electric Ventilators installed, each exhausting 21,900 C.F.M. With 2 H.P. Motor Ventilators absolutely dry inside after cloudburst.



F Fan Ventilator (Electric) Showing Electric Damper Control (Patented)

DIMENSIONS OF HIRSCHMAN F VENTILATORS AND GRAVITY CAPACITIES OF F, S-E and L-U VENTILATORS

Dimensions in Inches			Thickness of metal				Capacities at 10M.p.h.wind velocity Temperature difference inside and outside		
			Ga. galvan.		Oz. copper				
A	C + E	F	Head	Base	Head	Base	10°	20°	30°
12	33½	16	24	24	16	16	360	460	525
18	38	22	24	24	16	16	717	950	1050
24	48	30	24	22	16	18	1400	1675	1800
30	52½	36	22	20	18	20	2200	2600	2800
36	57	42	22	18	20	24	3160	3700	3900
42	62	48	20	18	20	24	4300	5000	5300
48	72	54	18	18	20	24	5390	6500	7000
54	76	60	18	18	20	24	7200	8300	8800
60	81	66	18	16	24	24	8000	9200	10000
66	88	72	18	16	24	32	10600	11500	12100
72	96	78	18	16	24	32	12700	14000	15000
84	101	92	18	16	24	32	17400	19000	22000

Recommendation

Where a high class ventilator with a high exhaust velocity against resistance is required, and where the Effico Rotary Head, or the Effico Wind-Electric Automatic Ventilator, due to obstructed locations or moderate even capacity, is not adaptable, then we recommend the F Fan Ventilator.

Adaptable for Public Lavatories, Bakeries, Hotel and Restaurant Dining Rooms and Kitchens, Chemical Laboratories, Industrial Plants, Projection Rooms in theatres and in all places for the exhausting of fumes, dust, gases, excessive heat or steam.

The Motor in this ventilator may be had in the ISOLATED MOTOR DRUM SECTION as shown on page 7.

Design — Appearance — Construction

Sturdy construction, weatherproofness, and appearance are given consideration in the design of this ventilator. For free air or as a pressure blower this is decidedly an apparatus of high merit.

Exhaust Head

The design is such that air driven 1200 ft. velocity through the head, registers only .032-in. water gauge static pressure. Thus for a fan or exhaust head, it is very desirable. When so used and the fan is cut off the ventilator still ventilates as a syphon ventilator. There are no shutters to blow or freeze shut. *Head only* may be purchased for use as outlet for large fan discharge.

Specifications on page 11.

CAPACITIES HIRSCHMAN F ELECTRIC VENTILATORS

Size of stack, in.	Fan speed, r.p.m.	Horse-power	Capacities—c.f.m. static pressure in inches of water				Type of motor	Shipping weight, lbs.	O-quiet X-silent *
			⅛ in. or less	¼ in.	⅜ in.	½ in.			
10	1750	1/50	250				S.D.	100	X
12	1750	1/20	725	400			S.D.	100	O
	1150	1/50	250				S.D.		X
18	1750	⅛	1500	900			S.D.		O
	1100	1/6	1500	900	520	200	S.D.		X
	850	1/20	820				S.T.D.		X
24	1100	¼	3000	2200	1600	1000	S.D.		O
	1700	1	4800	4200	3800	3000	S.D.	270	—
	1100	½	4000	3200	2350	1700	S.D.	225	—
	825	¼	2600	1500	920		S.T.D.		
30	1080	½	5000	4000	2700		S.D.	300	—
	720	½	4800	3800	2700	1900	T.		O
	900	1	6700	5600	4100	3100	S.		O
36	1080	2	8500	7600	6600	5400	S.D.	475	—
	900	1½	7300	6000	5000	3900	S.D.		O
	680	½	5000	3500			S.T.D.		X
42	680	1½	8000	6250	4800	3500	S.D.	525	O
	780	1½	7800	6500	5400	4000	T.		O
	1080	2½	10700	9700	8650	7700	S.D.		—
	465	1	7700	4800	2600		S.T.D.		X
48	365	1	10000	7000			S.T.D.	700	X
	680	1½	10000	8000	6400	4500	S.T.D.	700	O
54	365	1½	14000	7800			S.T.D.	780	X
	465	2	16000	12000	7500		S.T.D.		O
60	520	5	22000	18000	16000	13000	S.T.D.	860	—
	440	2	16000	12000			S.T.D.	800	O

*These capacities marked O and X are not maximum, but are based on silent requirements for public and semi-public buildings.

All capacities based strictly on A.S.H.V.E. code.

Prefix letters in motor column indicate kind of current for which the motors are available.

Alternating—S, single-phase, two or three-phase, 60 cycle. T, single-phase, two or three-phase, 25 cycle. D, direct-current.

The low speeds are suitable for schools, theatres, auditoriums and other quiet running requirements.

HIRSCHMAN S-E and L-U VENTILATOR

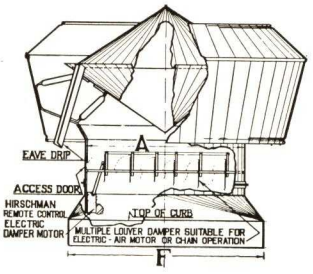


Diagram of L-U Ventilator

Patented

Two apparatus in one. Illustration shows electric control in position

S-E Ventilator

The S-E is a very high grade stationary type syphon ventilator. It starts exhausting at slightly over a two-mile wind without any temperature difference. Capacities shown in chart in dimension table above, left, are conservative.

L-U Ventilator

L-U Ventilator consists of an S-E Ventilator Head constructed with a specially short base and neck. In this neck is built a circular multiple blade louver damper.

S-E and L-U Ventilators are in general appearance similar to the "F" Electric Cowl, but the design is such, to give a greater syphonage exhaust capacity.

Specifications on page 11 of our Catalogue.

W. F. Hirschman Co. Inc. Buffalo, N.Y.

HIRSCHMAN ISOLATED ELECTRIC VENTILATORS

Hirschman Isolated Electric Motor Sections

These isolated sections can be supplied with any of our Electric Ventilators. These isolated sections can be used horizontally as shown below or vertically as shown at right.

Hirschman Isolated design gives the best known motor protection for any requirement. The Motor is well ventilated by outside air.

For Extreme Heat Protection

For extreme conditions or code requirements the isolated walls may be double shell asbestos or mineral wool packed as shown at right, or air space, or triple shell can be supplied.

Isolated construction is recommended for exhausting vapors, heat, acid fumes, dust, grease, paint spray booths, industrial conditions of all kinds, etc.

A remedy for bad draft in heating plants, chimneys, also for sluggish gravity heating air supply ducts.

Typical Applications

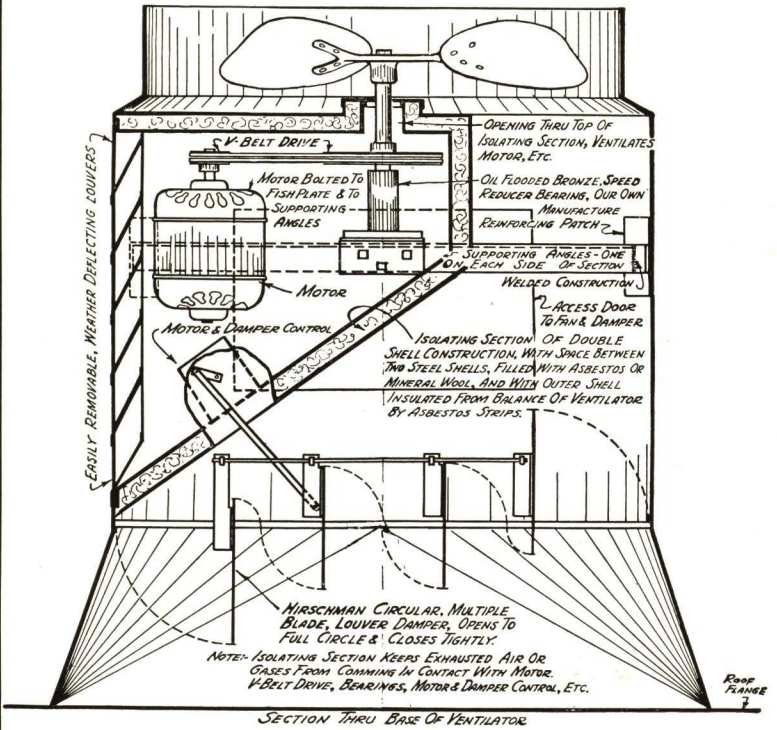
Motion Picture Booths
Laundries
Chemical Laboratories
Paint Spraying Rooms
Kitchens
Acid Conditions
Sand Blasting Rooms

Extreme Heat Applications

Heat Treating Ovens
Foundries
Hoods over Electric Furnaces
Porcelain Enamel Works
Bakery Ovens
Hoods over Coffee Urns and Ranges

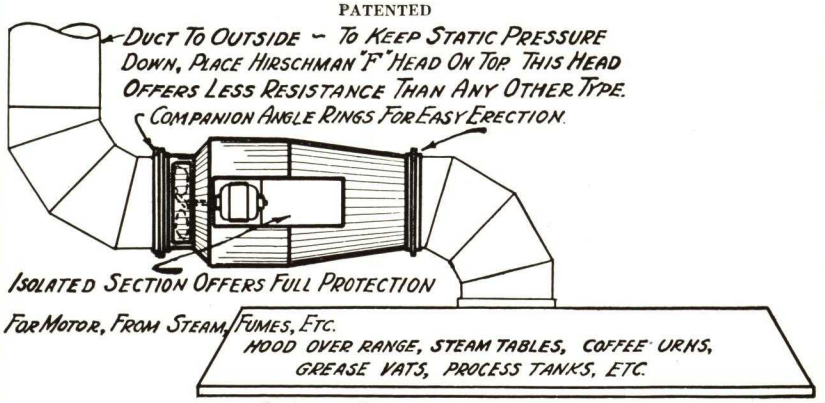
Hirschman Isolated Electric Motor Sections form a perfect protection for motors and are easy to clean. Made in sizes up to 96 inches diameter and to exhaust 90,000 C.F.M.

For specifications see page 11.



Section Thru Base Of Ventilator

PATENTED



Elevation Showing "Isolated" Electric Section In Connection With Exhaust Hood

HIRSCHMAN "LEROY" ELECTRIC VENTILATOR

Design — Appearance — Construction

This ventilator has been manufactured by us for over 16 years. It is a low priced electric ventilator and is 75% as efficient as our "F" Electric Ventilator.

The LeRoy Ventilator is constructed of high grade materials only and workmanship is first class like all other Hirschman products.

Capacities

For power capacities use "F" Electric capacities as shown on page 6 less 25%. For capacities as a syphon ventilator without motor running use our Firma capacities as given on page 8.

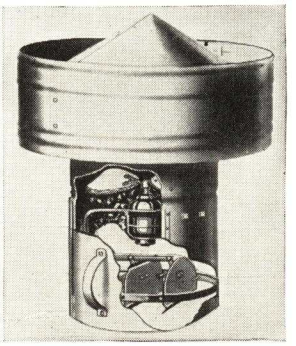
For a pressure exhauster of over ¼-in. static we recommend our "F" Electric and Hercules Power Ventilators, as described on the following and preceding pages. For industrial applications where noise is not the determining factor, considerably increased capacities can be furnished.

This ventilator may be furnished with or without base or damper, and damper, if furnished, may be controlled by chain or by our electric damper control, also controlling fan motor, etc. These controls are all described on page 10.

LeRoy Isolated Electric Ventilator

The motor in this ventilator may be had in the isolated motor drum section as shown above.

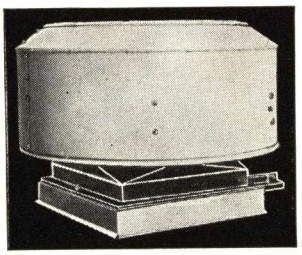
Specifications—see page 11.



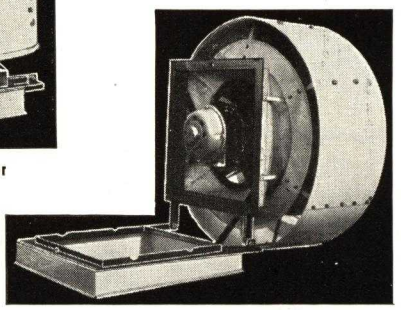
LeRoy Electric Ventilator
Pat.

HIRSCHMAN "HERCULES" POWER VENTILATORS

A Pressure Exhauster—Using Non-Overloading Design of Ventilating Fan



Hercules Power Ventilator
Patent pending



Hercules Ventilator Open for Servicing
Electric motor may be oiled, however, without opening head

The HERCULES POWER VENTILATOR has a fan that does not overload motor at any static pressure. The HERCULES POWER VENTILATOR blast wheel is the conventional backward curved type blade, recognized by Fan Engineers as the proper design for straight (FLAT) horse power curve.

The HERCULES POWER VENTILATOR is highly satisfactory for any ventilating problem, especially for exhausting air where static pressure is encountered, of one quarter inch water gauge and upward.

Its efficiency is at least equal to any centrifugal blower with this design of blast wheel.

Design and Construction

The cowl design is similar to our Super-Firma Syphon ventlator, which is the most efficient stationary ventilator that we manufacture. A ventilator tested by the Case School of Applied Science at Cleveland Ohio, for its weather-proofness and capacities, and now considered one of the highest grade of Roof Ventilators, with an unusually high syphon and gravity efficiency.

The Hercules is designed, as shown above, for very easy accessibility to the motor and fan. The motor and fan do not tilt over on the larger sizes but a very convenient service door is provided. The construction throughout is typical Hirschman Co. rugged design, compactness and the usual Hirschman symmetrical outline will be noted.

Bases

Bases to fit Hirschman steel curbs as described on page 10 (or to fit any curb) flashing over curb and downward four inches are a part of this apparatus. Where required a flat flaring flange, which will require no curb, can be furnished.

CAPACITIES OF HERCULES POWER VENTILATORS

Unit No.	Tip speed of fan	R.p.m. of fan	H.p. of motor	Curb dimension recommended.	C.f.m. capacities at s.p. in inches of water *				Telegraphic code
					¼ in.	⅜ in.	½ in.	¾ in.	
1	6800	1700	⅙	24 x 24	1100	900	800		hed
		1700	¼		1300	1050	900		haunt
2	5200	1100	⅙	24 x 24	1250	1100	1000		heal
		1100	¼		1700	1500	1400	1000	hawk
3	4300	850	¼	28 x 28	2000	1800	1700		helth
	5500	1100	½		2800	2600	2400	2000	hermit
4	4000	640	½	32 x 32	3200	2800			hero
	5350	850	¾		4000	3500	3000		heap
	6900	1100	¾					2500	hew
5	4000	550	½	32 x 32	3600	3200			higgle
	5000	680	¾		4300	3800	3300		hearn
	6250	850	1		5800	5300	4800	3900	hiss
6	3850	460	1	38 x 38	6500	6000	5500	4300	heven
	5700	680	1½		8000	7400	7000	5800	hive
7	3700	370	1	44 x 44	8000	7200	6400	5600	hoard
	4500	480	1½		11000	10100	9200	7300	heath
	5000	500	2		12500	11100	10200	8600	hoax
8	4000	375	¾	44 x 44	8000	7100	6000		hobo
	5000	450	1½		11800	10300	9300	7000	heave
	6000	575	2		13000	12000	11000	9000	hone
9	3600	320	2	50 x 50	14000	13000	11700	10000	hevy
	4200	360	3		19500	18500	17400	16000	hoof
10	3250	260	2	56 x 56	15500	14500	13500	12000	horde
	4000	330	3		17500	16500	15500	14000	heber
	5250	420	5		23000	22000	20500	19000	horny
11	3700	260	2	56 x 56	19000	16500	14000	11000	host
	4000	285	3		23000	20000	16600	14000	heckle
	4550	320	5		28000	24500	21000	16000	huff
	5100	360	7½		34000	30500	27000	23000	hunk

*These capacities are not based on maximum quantities but on quiet operation suitable for schools, etc. All capacities based on standard air at 29.92 in. Barometer, 70° Fahr., and a 50% relative humidity. Tests on A. S. H. & V. E. Code set-up.
Low speed fans are driven by V-belt drive. Motors are constant duty type.
Entire apparatus is isolated from building construction with best sound-proofing materials. In addition, motor and fan are mounted on rubber.
Curb dimensions given in table are based on using Hirschman Double Shell Steel Curbs and allow full area for air entering ventilator.
Additional allowances must be made for thicker types of construction.
See specifications on Page 11.

HIRSCHMAN "FIRMA" STATIONARY VENTILATORS

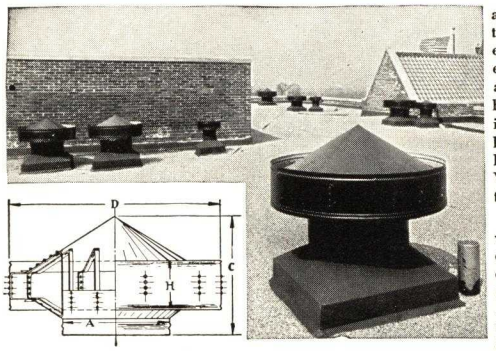


Diagram of Firma Ventilator

Equipment that can answer today's insistent demand for "lowest first cost" engages every alert Engineer and Contractor as never before, particularly if it answers a need for better service and longer life. The Firma Ventilator reflects these facts.

It is a high-grade ventilator, low in cost, highly efficient, correct in design and properly manufactured. A tested product of nineteen years' standing.

A ventilator designed to give exhaust efficiency at low wind velocities. Heavy gauges of metal are used. All steel bracing irons are rustproofed. All rivets have washers on burred side. Its automatic exhaust capacity is effective at a wind velocity of two miles per hour or more. For exhausting excessive heat, fumes, etc., Firma Ventilators have proven their worth. Installed on public buildings and industrial plants, etc., in most every state in the Union, and has the approval of all United States Departments, and of leading engineers and architects.

FIRMA VENTILATOR CAPACITIES AND SIZES (Certified Capacities)

Size, in. A	Capacities at 5 m.p.h.		Dimen., in.		Oz. copper		Gauge galv.	
	Wind. 10° F. temp. diff.	Wind. 30° F. temp. diff.	C	D	Neck	Storm band and cone	Neck	Storm band and cone
10	170	225	9	17	14	14	26	26
12	260	325	11	21	16	14	24	26
14	335	440	14	25	16	14	24	26
16	440	580	18	30	18	14	24	24
18	555	730	18	30	18	14	22	24
20	685	900	20	36	18	16	22	24
24	985	1300	21	43	18	16	22	24
30	1540	2030	25	52	20	16	20	22
36	2215	2930	30	60	24	16	18	22
42	3015	3980	38	72	24	18	18	22
48	3940	5200	38	82	24	18	18	22
54	4985	6585	44	82	24	18	18	22
60	6155	8130	58	102	24	20	18	20
66	7400	9900	60	102	24	24	18	18
72	8900	12000	60	120	24	24	18	18
84	12000	16000	72	144	32	24	18	18
96	16000	21000	78	168	32	24	18	18

HIRSCHMAN "LORNATE" CONCEALED VENTILATOR

For Syphon or Electric Exhaust

This is a most conventional air exhaust outlet. It is suitable for any type of architecture, and is strictly weatherproof. Available as a syphon head or as an electric ventilator. It is made in any size; square, rectangular, or round. For brick or stone flue, we supply metal waterproof concealed head. For all metal flue, the head and stack above roof is furnished by us.

Write for booklet describing many designs and their applications.

"Lornate" Electric Attachment

All designs are furnished as electrics if required. Motor housing is supplied in *vertical* and *horizontal* drives, complete with special quiet running motors. Motors are either rubber or spring mounted. Canvas duct connections are supplied if required. Large sizes have V-belted fan reduction drives.

Exhaust Capacity and Static Pressure

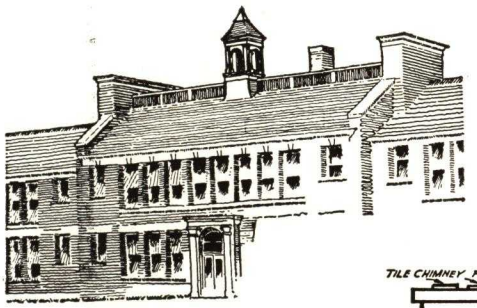
The "Lornate" Syphon Ventilator in 10° temperature difference, five (5) mile wind, for two-story building, exhausts 200 f.p.m. flue velocity.

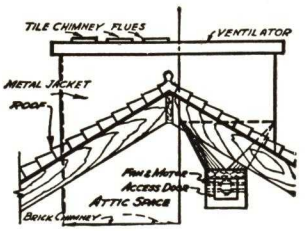
The "Lornate" Head when used as an exhaust head for fan discharge develops .125-in. water resistance at 800 ft. flue velocity. A. S. H. & V. E. Code.

Capacities (Quiet Operation)

The "Lornate" Electric Ventilator for silent operation (sleeping rooms). Engineers please estimate 600 f.p.m. flue velocity. Quiet operation (schools, hospitals) 750 f.p.m. Other requirements (institutions, attics, isolated location) 800-1000 flue velocity. Capacities are based upon quiet operation, not maximum possibilities.

Specifications—*See page* 11 *of our catalogue.*





LORNATE ELECTRIC VENTILATOR CAPACITIES

Please select flue velocity to determine sizes

Hp.	Static pressure in inches of water			X—Silent O—Quiet
	⅛ in.	¼ in	½ in.	
	Capacities in cubic feet per minute			
1/30	400	200		O
1/20	500	250		X
1/6	1000	800		O
1/6	1500	900		O
¼	2000	1400	1000	X
¼	3000	2200	1000	O
½	4000	3200	2200	O
½	5000	3500		X
¾	6000	5000	2900	O
1½	8000	6000	3400	O
2	10000	7000	4500	O
2	12000	9000	7000	O
3	15000	12000	6000	O

HIRSCHMAN DAMPERS—LOUVERS

Dampers—All Hirschman Company Dampers, installed in ventilator or otherwise used, may be operated by chain, by Hirschman Electric or Pneumatic Controls, manual or thermostatically, if desired.

Self-Closing Damper (Non-Electric) may be installed in the following ventilators only; "F" Electric, LeRoy Electric, Lornate and Isolated "F" Electric Ventilators.

Self Locking Device—Any Ventilator may be equipped with Hirschman Self-locking Device if desired. Locks damper closed. (Only one chain needed.)

Fire Dampers—Fusing link can be supplied with any damper to open or close in case of fire.

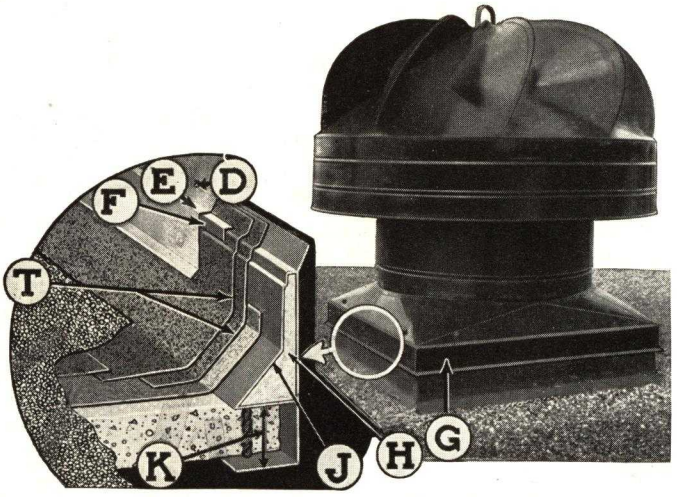
Louver Dampers—We are manufacturers and patentees of the Circular Multiple Louvers as installed in our Louver Unit Ventilators. See pages 4 and 6.

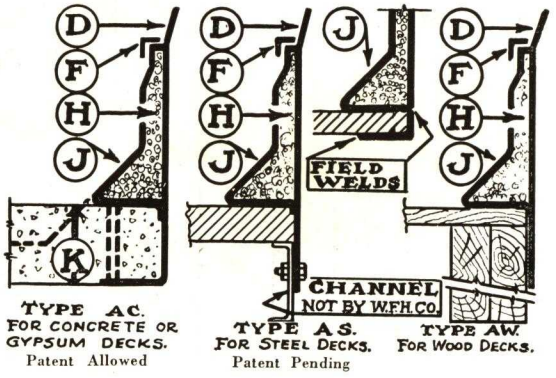
We also manufacture intake, recirculating, mixing dampers, fixed louvers, etc. We make intake louvers, fixed and movable, single units and in combinations in one frame; also, sun-ray deflecting louvers operating with or without our Hirschman Electric Control; also in coordination with fans supplying or exhausting air. Wiring information and diagrams are given when requested. Our controlled Louver (electrically) may be controlled by thermostat or by switch control, all manufactured by us.

Hirschman Anti-back-draft Damper—Micrometer adjustment on damper permits very delicate balancing. Suitable for gravity or power exhaust. Recommended for troublesome air ducts.

HIRSCHMAN STEEL CURBS for VENTILATORS and SKYLIGHTS

Double and Single Shell—For All Types of Roof Deck Construction





TYPE AC. FOR CONCRETE OR GYPSUM DECKS. Patent Allowed

TYPE AS. FOR STEEL DECKS. Patent Pending

TYPE AW. FOR WOOD DECKS.

HIRSCHMAN DOUBLE and SINGLE SHELL Steel Ventilator Curbs are built for decks of concrete, gypsum, steel and wood. Their light weight reduces load on concrete roofs by many tons. They serve as a reinforcing frame for roof opening and for ventilator base, reducing cost of roof and also cost of ventilators because the Hirschman Double Shell Steel Curb side walls are 1″ thick whereas concrete curbs, especially for larger curbs (36″ upwards) are six to eight inches thick. The smaller dimension of base enhances appearance of installation considerably.

The lower end of curb being a form for concrete roof slab, being left in place after concrete is poured, leaves a solid and nicely finished opening. The top end forms a real anchor for ventilator or skylight (D) and a lock for roofing felt or flashing (F.)

(E) Offset in ventilator base forms very rigid construction.

(J) "Cant" strip is integral part of curb.

(K) This standard dimension is 4″. It can be modified.

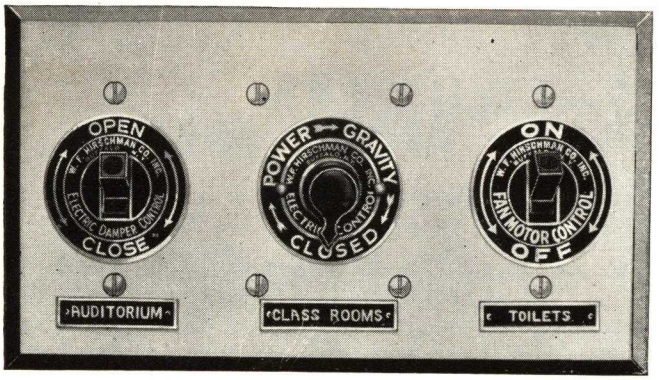
COST—Lower cost than concrete due to saving in ventilator installation cost, forms, concrete, additional metals, labor, cant strips, form removals, etc.

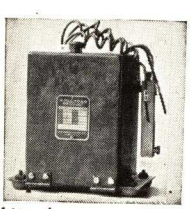
DIMENSIONS AND GAUGES FOR VENTILATOR CURBS

Ventilator size "A"	12	18	24	30	36	42	48	54	60	72	96
Curb size BxB actual opening	16x16	22x22	30x30	36x36	42x42	48x48	54x54	60x60	66x66	80x80	116x116
Gauge steel	22	22	22	22	22	22	22	18	18	18	16
Gauge steel in channel section					18	18	18	18	18	16	16

Style B (single shell) not illustrated, is available for industrial use and for sections of the country not subject to intense cold. See specifications page 11.

HIRSCHMAN ELECTRIC DAMPER and MOTOR CONTROL





Hirschman Electric Damper and Motor Fan Control

HIRSCHMAN ELECTRIC CONTROLS will operate any type of damper or louver, round, square, rectangular, or multiblade in either vertical or horizontal position. Will control motor, louvers, etc., in any part of the building.

They require no attention or oiling and are totally enclosed. These electric controls are absolutely positive and hold the subject rigid in desired position and also coordinate with fan so motor cannot be operated when dampers are closed, and other essentials, such as opening damper with or without operating motor.

HIRSCHMAN CONTROLS are Manual, Thermostat, or Hydrostat operated. They operate on any voltage or current available. Some are universal and interchangeable. Specify or order by number, and give designation plate wording.

Flush plates are available in standard and special finishes.

Engraved aluminum designating plates are available in single or gang combinations with any HIRSCHMAN CONTROL with following words: *See Specifications page* 11.

AUDITORIUM	CLASS ROOM ( ) Give No.	LOCKER ROOM
GYMNASIUM		CAFETERIA
BOYS' TOILET	LABORATORY	RESTAURANT
GIRLS' TOILET	MEN'S ROOM	KITCHEN
TOILET	WOMEN'S ROOM	LAVATORY
TEACHERS' ROOM	SHOWER ROOM	EXHAUST SYSTEMS

Control number manual operation	Position engraved on flush or surface switches	Operation of control	Control number thermostat operation	Number wires from switch to control
M2 AM2S	Open: Closed Electric Damper Control	Opens and closes Controls damper only	T2 AT2S	3 2
MF2 AMF2S	On: Off Fan Motor Control	On; fan on damper open Off; fan off damper closed	TF2 ATF2S	3 2
M3	Open: ½ Open: Closed Electric Control	Open; damper open ½ open; damper ½ open Closed; damper closed	—	4
MF3	Power: Gravity: Closed Electric Control	Power; damper open, fan on Gravity; damper open, fan off Closed; damper closed, fan off	TF3	4

Groups of damper motors of same type may be operated from one switch where desired.

SPECIFICATIONS FOR HIRSCHMAN PRODUCTS

EFFICO FULL AUTOMATIC WIND-ELECTRIC VENTILATORS *(see page 3 of our catalogue)*. The roof ventilators to exhaust from (....) shall be of the sizes and capacities as shown on plans and shall be automatic wind and electric driven Rotary Ball Bearing ventilators. Each ventilator shall contain the Hirschman Adjustable Wind Actuated Automatic Electric Circuit Breaker. The design of the ventilators shall be such that automatically the electric driven fan shall exhaust the specified volume of air when the wind driven section of ventilator is not exhausting the required specified volume of air.

The electric motors utilized in these ventilators shall be of....cycle....phase.... volts, shall be fully enclosed, resilient mounted, constant duty, silent operating motors. They shall be as manufactured by (....). These shall be installed in the ventilators in an approved manner, and the entire apparatus shall operate efficiently and silently.

(For Isolated motor design see specification on Isolated Ventilators.)

Each ventilator shall contain a Circular Multiple Louver Damper *(for operating device of dampers, see control data on page 10)*. Dampers for these ventilators shall be operated by (Hirschman Electric Damper Control). *Note: (See Ventilator Electric Control Specification)* (Pneumatic motors as specified under temperature regulation) (Chain) controlled from location as selected by the architect.

These ventilators shall be of (Galvanized....Iron) (Copper) of manufacturer's standard gauges. Galvanized ventilators to be painted gray enamel.

These ventilators shall be the EFFICO Full Automatic WIND-ELECTRIC Ventilators as manufactured by the W. F. Hirschman Company of Buffalo, N. Y. *(Special sound deadening mounting is not needed for this ventilator.)*

EFFICO FULL AUTOMATIC WIND-ELECTRIC VENTILATOR HIRSCHMAN MASTER CONTROL specification *(see page 3 of our catalogue)*. The roof ventilators to exhaust from (....) shall be Rotary Ball Bearing of sizes and capacities shown on plans, consists of the following group of controlled ventilators *(Class Room No. 1-3-7-8-9-gymnasium)*. Each ventilator to contain an electric motor driven fan of required size and horse power motor to exhaust the required volume of air as indicated on the plans. These electric motor driven fans shall be controlled by one Master Automatic WIND-ELECTRIC Ventilator. This Automatic Ventilator designated on the plans shall contain the Hirschman Adjustable Wind Actuated Automatic Electric Circuit Breaker. The design of the ventilators shall be such that automatically the electric driven fan shall exhaust the specified volume of air when the wind driven part of the ventilator is not exhausting the required specified volume. The Master Control shall control the energizing and de-energizing. These ventilators shall be the EFFICO WIND-ELECTRIC Non-Automatic Ventilators and one EFFICO WIND-ELECTRIC Full Automatic Ventilator so designed as a master control ventilator.

The electric motors utilized in these ventilators shall be of....cycle....phase.... volts, shall be fully enclosed, resilient mounted, constant duty, silent operating motors. They shall be as manufactured by (....). These shall be installed in the ventilators in an approved manner, and the entire apparatus shall operate efficiently and silently.

(For Isolated motor design see specification on Isolated Ventilators.)

Each ventilator shall contain a Circular Multiple Louver Damper. *(Specification writer:—For operating device of dampers, see control data on page 10.)*

Dampers for these ventilators shall be operated by (Hirschman Electric Damper Control). *Note: (See Ventilator Electric Control Specification)* (Pneumatic motors as specified under temperature regulation) (Chain) controlled from location as selected by the architect.

These ventilators shall be of (Galvanized....Iron) (Copper) of manufacturer's standard gauges. Galvanized ventilators to be painted gray enamel.

These ventilators shall be the EFFICO WIND-ELECTRIC Non-Automatic Ventilators and one EFFICO WIND-ELECTRIC FULL Automatic Ventilator as manufactured by the W. F. Hirschman Company of Buffalo, N. Y. *(Special sound deadening mounting is not needed for this ventilator.)*

"F" FAN VENTILATORS *(see page 6 of our catalogue)*. The fan ventilators shall be of the sizes as shown on the plans, and shall have (round) (square) style bases. They are to be of (Gal. Iron) (Copper) of manufacturer's standard gauges. Exhaust area between cones and storm band to be 60% greater than neck area. Galvanized Ventilators to be painted with gray (....) enamel. The motors of....r.p.m.....hp. shall handle....c.f.m., and operate on....volts....cycles....phase current. *For Isolated motor design see specification on Isolated Ventilators.* They shall be the Hirschman (F Fan Ventilator) as manufactured by the W. F. Hirschman Co., Inc., Buffalo, N. Y. Dampers for these ventilators shall be operated by (Hirschman Electric Damper Controls. *Note: See page 10 for type.)* (Pneumatic motors as specified under temperature regulation) (Chains).

HERCULES POWER VENTILATORS *(see page 8 of our catalogue)*. The power ventilator apparatus exhausting from (....) shall have capacity of....at....S. P. and powered by....H. P. Motor. Apparatus exhausting from (....) shall have capacity of ....at S. P. and powered by....H. P. motor. Shall be of the sizes as shown on the plans and shall have manufacturer's standard (square) style bases. They are to be of (Galv. ....Iron) (Copper) of manufacturer's standard gauges. Galvanized ventilators to be painted gray enamel.

The Fan Wheel shall be of the multiblade, backward curved, no-overload-horsepower at any static pressure type. Fan tip speed shall not exceed (....) F. P. M. and shall operate quietly and free from vibration at specified capacities. The electric current for motor is (....) cycle, (....) volts, (....) phase. Motor shall be ball bearing, constant duty of (....) manufacture. Control switch.....

Ventilator design shall be such as to give quick and free access to electric motor and fan. Each entire apparatus shall be mounted on sound deadening (prepared cork) (rubber impregnated felt) and no noises or vibration shall be transmitted into building, all as approved by the architect.

This apparatus shall contain all the essential requisites of the Hirschman Hercules Power Ventilator as manufactured by the W. F. Hirschman Co., Inc., Buffalo, N. Y.

LEROY ELECTRIC FAN VENTILATORS *(see page 7 of our catalogue)*. The fan ventilators shall be of the sizes as shown on the plans, and shall have (round) (square) style bases. They are to be of (Gal....Iron) (Copper) of manufacturer's standard gauges. Galvanized ventilators to be painted gray enamel. The motors of....r.p.m..... hp. shall handle....c.f.m. and operate on....volts....cycles....phase current. *For Isolated motor design see specifications on Isolated ventilators.* They shall be the Hirschman (LeRoy Electric Fan Ventilator) as manufactured by the W. F. Hirschman Co., Inc., Buffalo, N. Y. Dampers for these ventilators shall be operated by (Hirschman Electric Damper Control. *Note: See page 10 for type.)* (Pneumatic motors as specified under temperature regulation.) (Chains.)

LORNATE FAN VENTILATOR *(see page 9 of our catalogue)*. The ventilators shall be of the sizes as shown on the plans, and as detailed in the drawings. They are to be of (Gal....Iron) (Copper). They are to operate absolutely silent, and handle.... c.f.m. at fan speed of....r.p.m. Motors shall operate on....volts....cycle...phase current. They shall be the Lornate Fan Ventilators as manufactured by the W. F. Hirschman Co., Inc., Buffalo, N. Y. Damper for these ventilators shall be operated by (Hirschman Electric Damper Control. *Note: See page 10 for type.)* (Pneumatic motors as specified under temperature regulation.)

HIRSCHMAN ISOLATED ELECTRIC MOTOR SECTION *(see page 7 of our catalogue)*. The electric motors exhausting from (....) shall have the electric motor, fan drive, bearings, control, etc., fully protected from all air being exhausted by means of an enclosing metal shell (mineral wool filled double shell) housing. This Isolated section shall be designed to maintain full and satisfactory ventilation and access to contained apparatus. This Isolated section shall become an integral part of the ventilating unit covered in this specification.

SILENT CHURCH VENTILATOR. Ventilating apparatus No. (....) exhausting from (....) shall discharge.....C.F.M. at....S.P. Shall be absolutely noiseless and vibrationless. Electric Damper and Motor Control shall be by one remote control switch, giving power, gravity and closed position and fan must not run on closed or gravity positions. This unit shall be made of heavy galvanized sheets; motor, damper control and unit mountings shall be of angles and channels, assembled by welding; motor shall be fully enclosed, resilient mounted, continuous duty type operating and driving fan at suitable speed and entire unit shall be resiliently mounted in a manner approved by architect. This ventilator unit shall comprise an electric motor, fan, louver damper. Electric damper and fan control self contained unit. It shall be the Hirschman Silent Church Ventilator and contain every feature and construction requisite of this Company's apparatus. It shall be manufactured by W. F. Hirschman Company or approved equal.

EFFICO INTERNAL LOUVER UNIT VENTILATORS *(see page 4 of our catalogue)*. The roof ventilators shall be of the sizes as shown on plans; shall be Rotary Ball Bearing Ventilators comprising fully enclosed conical rotating cowl, the exterior of which shall be covered with wind propelling blades and the interior with suction blades. They shall be constructed of (Galvanized....Iron) (Copper). Bases to be of (round) (square) style and the stack to be sufficiently high to elevate the propelling blades above the coping. The neck shall contain Multiple Blade Circular Louver Damper. These dampers to be operated by means of (Hirschman Electric Damper Control *(see page 10 of our catalogue for type)*; (pneumatic dampers as specified under temperature control); (Chain for manual operation).

They shall be the EFFICO Internal Louver Unit Ventilators comprising the head, base, Multiple Louver Damper, access door, etc., of all standard gauges and construction as manufactured by the W. F. Hirschman Company, Inc., of Buffalo, N. Y.

EFFICO ROTARY BALL BEARING Ventilators *(see page 5 of our catalogue)*. The roof ventilators of the sizes as shown on the plans shall be Rotary Ball Bearing Ventilators comprising fully enclosed conical cowl; the exterior of which is covered with wind propelling blades, the interior with suction blades. The bearings shall be fully ball bearing, oil flooded fully enclosed in oil and dust tight housing. The ventilators shall be mounted on necks and stacks sufficiently high so that the propelling blades shall be above coping. The bases of (square) (round) style of same gauge as ventilator neck. Each ventilator shall contain a well fitted chain operated butterfly damper. The ventilators shall be of (Galvanized....Iron) (Copper) of the manufacturer's standard gauges.

They shall be the EFFICO Rotary Ball Bearing Ventilators as manufactured by the W. F. Hirschman Company, Inc., of Buffalo, N. Y.

L-U LOUVER UNIT Ventilators *(see page 6 of our catalogue)*. The exhaust ventilator units for syphon exhaust shall be of sizes as shown on the plans. They shall be of the manufacturer's standard gauges of (Galvanized....Iron) (Copper). The ventilator cowl shall comprise an inverted cone which shall be larger and extend upward beyond the upper cone forming a weatherproof gutter. The storm band shall comprise an upper and lower frustrum shape. The exhaust area between the storm band and cones shall be at least 50% greater than neck area of the given size ventilator. The ventilators shall be strictly weatherproof. Each ventilator shall be equipped with Circular Multiple Blade Louver Damper installed in the neck of the ventilator by the manufacturer of the ventilator. The operation of these louver dampers shall be by (Hirschman Electric Damper Control) *(Note: See page 10 of our catalogue for type)*; (pneumatic motors as specified under temperature control specification); (chain). Heads, bases, dampers and damper motors shall all be completely assembled at the manufacturer's plant.

They are to be the Hirschman L-U LOUVER UNIT Ventilator as manufactured by the W. F. Hirschman Company of Buffalo, N. Y.

S-E VENTILATORS, Syphon Exhaust *(see page 6 of our catalogue)*. The roof ventilators of the sizes as shown on the plans are to be constructed of (Gal....Iron) (Copper) of manufacturer's standard gauges. They shall be Hirschman S-E ventilators as manufactured by the W. F. Hirschman Co., Inc., Buffalo, N. Y. They shall be mounted on (round) (square) style bases of same gauges of metal as the necks of the ventilators.

FIRMA STATIONARY VENTILATORS *(see page 8 of our catalogue)*. The roof ventilators of the sizes shown on the plans shall be of standard manufacturer's gauge of (Gal....Iron) (Copper). They shall be the Firma stationary Ventilators as manufactured by the W. F. Hirschman Co., Inc., Buffalo, N. Y., and shall be mounted on (round) (square) style bases of same metal gauges as the necks of the ventilators.

EFFICO SKYLIGHT BASES *(see page 4 of our catalogue)*. These ventilators to be equipped with Effico Skylight Bases of (Gal....Iron) (Copper) to fit over....curbs. These skylights are to be of puttyless construction and design as manufactured by the W. F. Hirschman Co., Inc., Buffalo, N. Y.

HIRSCHMAN STEEL CURBS *(see page 10 of our catalogue)*. (The roof ventilator) (skylight) curbs of sizes as shown on plans shall be of the (double shell) (single shell) steel construction. The double shell design shall have one inch thick hollow walls, which shall be filled with mineral wool. The curbs shall serve as a mounting for the roof ventilators; shall contain a 45 degree cant for the roofing felt; a lock for the roof flashing around the curb and an anchor for the roof ventilators. These curbs shall extend (8 inches above) (12 inches above the base roof line). *(If roof of poured concrete* the curb shall serve as a permanent form for pouring the concrete around the ventilator opening and shall be placed in position before the pouring of the concrete.)

These above curbs shall be the type *(see data page 10)*. They shall be the Hirschman (double shell) (single shell) Steel Curbs type (....) (....) as manufactured by the W. F. Hirschman Company of Buffalo, N. Y.

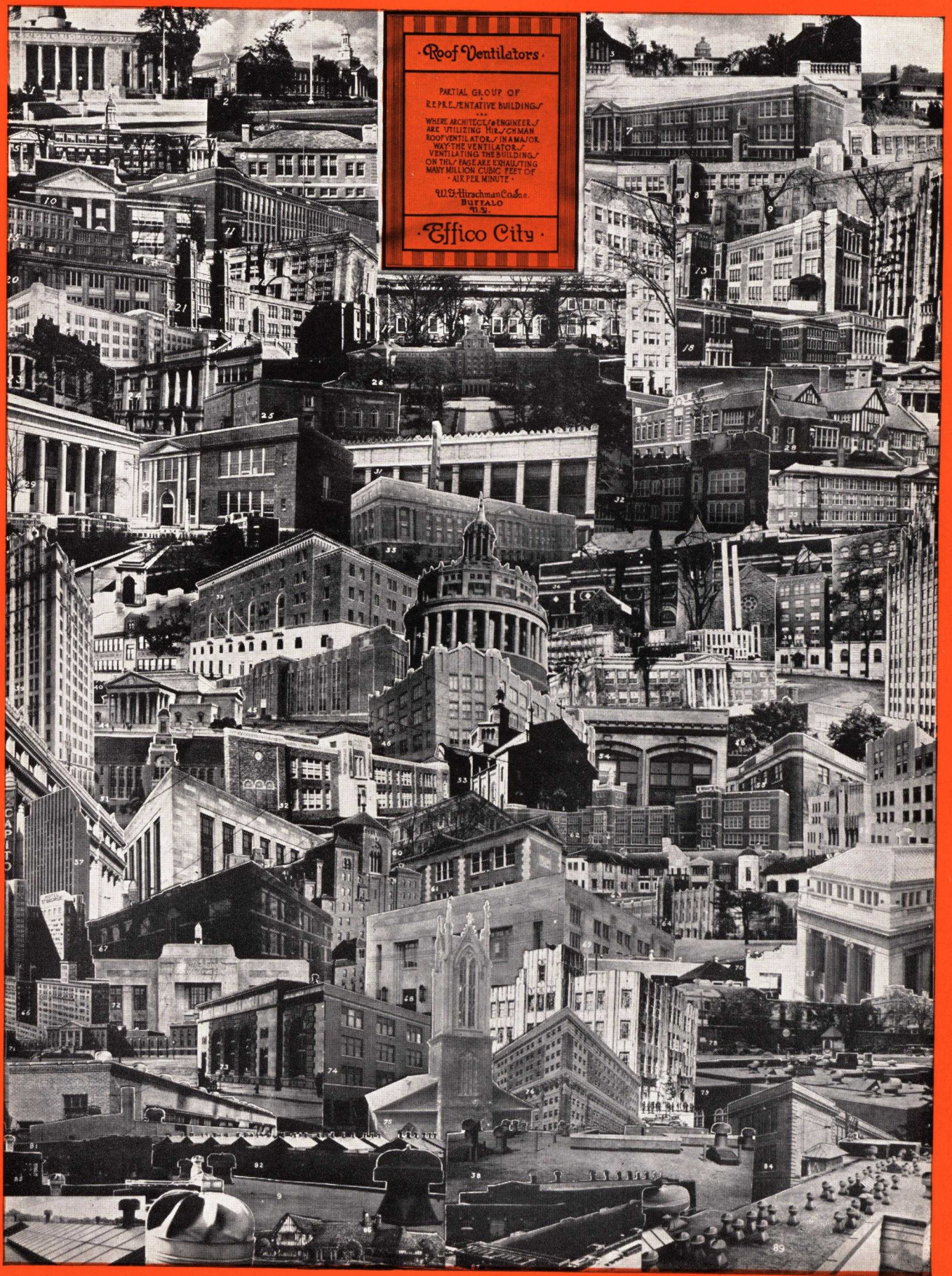
HIRSCHMAN ELECTRIC CONTROL *(see page 10 of our catalogue)*. All (....) ventilator dampers (and electric ventilator fan motors) shall be controlled by remote (manual) (thermostat) operated electric controls. The control switch for *(auditorium)* shall be by one switch controlling damper and fan motor. The face plate showing operating positions etched on (same) ("Power," "Gravity," "Closed"). *(Specification writer see other position plates this bulletin)*, also bearing the designating word *(Auditorium)*. The switch shall be (flush mounted) type *(in gang with others* indicated elsewhere). Face plates of (brushed brass) (chromium) (brown bakelite). *(Specification writer see page 10 this bulletin)* as regularly furnished by the control manufacturer. Control shall operate on same current as fan motor.

These controls shall be installed by the manufacturer in the ventilators and properly tested before shipment to insure correct operation. All ventilator controls and switches shall be furnished by ventilator contractor and shall contain all the requisites of the W. F. Hirschman Company Electric Control, type (....).

All the above controls, switches and location plates, dampers and ventilators shall be manufactured and assembled by one manufacturer. They shall be as manufactured by W. F. Hirschman Company of Buffalo, N. Y.

Control for (....) ventilator shall be same as above but designating plate bearing word (....).

For specifications on Coolers Continuous Ventilator see page 2.


Roof Ventilators
PARTIAL GROUP OF
REPRESENTATIVE BUILDINGS
WHERE ARCHITECTS & ENGINEERS
ARE UTILIZING HIRSCHMAN
ROOF VENTILATORS IN A MAJOR
WAY-THE VENTILATORS
VENTILATING THE BUILDINGS
ON THIS PAGE ARE EXHAUSTING
MANY MILLION CUBIC FEET OF
AIR PER MINUTE
W. G. Hirschman Co. Inc.
BUFFALO
N. Y.
Effico City

MILCOR STEEL COMPANY

MILWAUKEE, WIS. CANTON, OHIO

CHICAGO, ILL. KANSAS CITY, MO. LA CROSSE, WIS. ROCHESTER, N. Y. NEW YORK, N. Y. ATLANTA, GA.

For Our Catalogs on Milcor Fireproof Products, Access Doors and Steel Decks, see File Index

MILCOR VENTILATORS

Milcor Nu-Air

Construction of the Milcor Nu-Air Ventilator is shown in the smaller view at the right. Arrows indicate direction of air currents

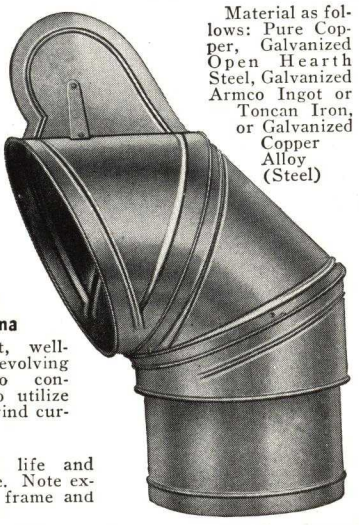
Ventilator Bases to be manufacturer's standard design to fit roofs as shown on plans

Milcor Turbine

Milcor Nu-Alpina

An efficient, well-built syphon revolving ventilator, so constructed as to utilize the slightest wind currents

Built for long life and satisfactory service. Note exceptionally strong frame and blade construction



Material as follows: Pure Copper, Galvanized Open Hearth Steel, Galvanized Armco Ingot or Toncan Iron, or Galvanized Copper Alloy (Steel)

Milcor Nu-Air Ventilator

Description—Rigidly built, scientifically designed to create upward suction of air within the flue regardless of wind direction. Outer air currents rush in between the weather band and curved deflector. Currents travel upward and outward, constantly discharging a full volume of impure air through the ventilator shaft. Furnished with steel or glass top. Suitable for factories, industrial plants, schools, hospitals, air ports, homes, etc.

Sizes, in.	Weights, lb.	Capacities
8	10	12,000
10	15	15,000
12	20	21,000
14	25	29,700
16	40	39,000
18	45	48,600
20	55	60,000
24	80	87,000
30	120	135,000
36	175	210,000
48	250	300,000

Milcor Turbine Ventilator

Description—The slightest motion of air is sufficient to operate the Milcor Turbine Ventilator. A vacuum is created as soon as the head begins to revolve because the air within the head is expelled by centrifugal force. Actually pulls out the impure air automatically, continuously and silently. Down drafts a mechanical impossibility.

Strong frame work. Equipped with Alemite fittings and when once installed requires no attention, care or adjusting.

Sizes, in.	Weights, lb.	Capacities
8	20	17,300
10	27	26,500
12	38	38,600
15	50	54,000
18	85	85,200
20	100	105,100
24	160	149,000
30	225	225,000
36	270	281,000
42	460	324,000
48	550	360,000

Milcor Nu-Alpina Ventilator

Description—Entire revolving head of this ventilator constantly faces away from the wind. A vacuum is thus created which adds to the syphonating power of the wind currents entering the opening at the bottom of the revolving head.

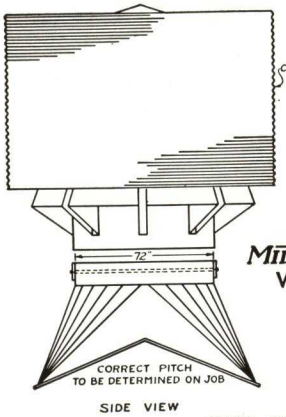
Staunchly constructed and rigidly braced. Nothing lighter than 26-gauge galvanized steel is used in fabrication. It has a cast bronze ball race with solid brass ball bearings, and is painted with a heavy coat of aluminum.

Sizes, in.	Weights, lb.	Capacities
8	25	12,500
10	27	15,000
12	40	17,500
14	50	23,500
16	60	32,000
18	75	41,000
20	125	51,000
24	175	70,000
30	300	107,000
36	400	160,000
48	550	280,000

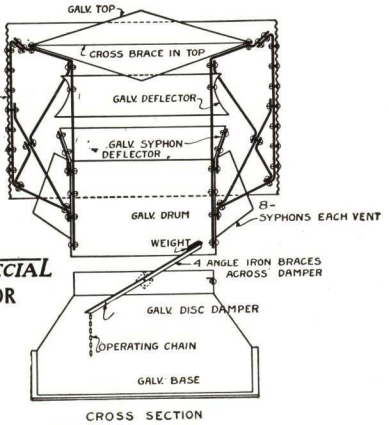
Capacities Indicate Cubic Feet of Air Discharged per Hour; Wind Velocity 5 Miles per Hour

Write for further information

Milcor's Latest Ventilator Development



SIDE VIEW



CROSS SECTION

MILCOR SPECIAL VENTILATOR

MILCOR Special

SIZES, GAUGES, WEIGHTS AND CAPACITIES

Capacities Indicate Cubic Feet of Air Discharged per Hour; Wind Velocity 5 Miles per Hour

Sizes, in.	8	10	12	14	16	18	20	24	30	36	48	60	72
Material, ga.	26	26	26	24	24	24	24	24	20	20	20	18	16
Weights, lb.	20	35	40	70	105	155	200	230	440	525	650	1000	3000
Exhaust capacity	18000	27000	38000	53000	70000	85000	106000	145000	220000	340000	610000	950000	1500000

PENN VENTILATING COMPANY

Manufacturers of Rotary—Ridge—Stationary—Power Ventilators

MAIN OFFICE AND WORKS
2810-2812 Richmond Street, PHILADELPHIA, PA.

NEW YORK SALES OFFICE: 132 Nassau Street

AGENTS IN ALL PRINCIPAL CITIES

LIBERTY SIPHONAGE VENTILATOR

Because of the ingenious, effective way in which it harnesses and utilizes outside air currents, the Liberty Ventilator represents the supreme achievement of modern engineering skill.

All of the air currents—upward, downward, horizontal or swirling—are brought under control and forced to perform their task of drawing heat, foul air, steam fumes, smoke or floating dust up and out of the building.

The Liberty Ventilator utilizes four principles of physical science: (1) air impingement; (2) positive and negative air action (pressure and vacuum); (3) siphonage; (4) stack action.

The following data was compiled by our Engineering Department and also under actual conditions while in competitive test.

LIBERTY VENTILATOR DATA

Size, in. A	Overall, Ht. in. B	Width, in. C	Area, sq. in.	Discharge cap. per min., cu. ft.	Approx. ship'g weight, lb.	Gauge of metal	Wgts. of copper, oz.
12	24	21	113	490	26	24	18
18	36	31½	254	1259	65	24	20
24	48	42	452	2233	125	22	20
30	60	52½	707	3485	220	20	24
36	72	63	1018	5027	395	20	24
42	84	73½	1385	6841	460	20	24
48	96	84	1810	8896	600	20	32
54	108	94½	2290	11306	850	20	32
60	120	105	2827	13958	900	18-20	32

Liberty Ventilator Capacities—These figures are based on the following conditions: Wind velocity—10 miles per hour; difference in temperature of indoor and outdoor air—20° F.; height of ventilators above intake—30 ft.

PENN TURBINE VENTILATOR

Size, in.	Exhaust per hour, cu. ft. on 4 mile wind
6	14,363
7	15,500
8	17,420
9	22,500
10	26,200
12	38,375
14	43,325
15	46,800
16	50,550
18	76,800
20	109,500
24	150,000
30	230,500

The Penn Turbine Ventilator is a true rotary, air driven, suction turbine, that works automatically, continuously and silently—without maintenance or operating expense.

The slightest motion of air is sufficient to operate the turbine. A vacuum is created as soon as the head begins to revolve because the air within the head is expelled by centrifugal force. This ventilator, therefore, pulls out the impure air. The rotating turbine makes downdrafts a mechanical impossibility.

The turbine rotor is fitted into a ball bearing setting. This makes for ease of rotation so that the slightest breeze causes the turbine to spin—without noise, wobbling or effort. The ball bearing action prevents wear of moving parts and makes repairs and maintenance unnecessary. Lubrication is not required.

PUL-AIR VENTILATOR

The Pul-Air Ventilator has been designed to give the utmost of efficiency and it successfully meets in every particular the demand for a highly efficient weatherproof ventilator of a moderate price.

The Pul-Air Ventilator is staunchly built. It is weatherproof. It is well designed, architecturally as well as mechanically. It is a practical, efficient, dependable, and economical ventilator for schools, hospitals, institutions, theaters, factories, barns, foundries, train sheds, etc.; an invaluable auxiliary, too, to forced draft or mechanical ventilating systems, and for correcting faulty drafts in chimney flue stacks.

PENN POWER VENTILATOR

The power unit was developed by Penn Ventilating Engineers to meet adverse conditions in the ventilating field, where a fan motor is essential as an auxiliary. When dust, fumes, heat, smoke, etc., must be exhausted periodically, or when resistance to flow (static pressure) is encountered, we recommend the Penn Power Ventilator. When the motor is not in operation this unit is so constructed to give the same exhaust capacity as the Liberty Siphonage Ventilator.

This unit may be equipped with a temperature control for the operation of the motor fan at any desired temperature, irrespective of the varying outside wind velocity or outside temperature, thus assuring constant and positive ventilation.

Motors used in the construction of the power units are the best obtainable for vertical operation. Motors are fitted with grease cups and require attention once or twice a year. This can be done through the weatherproof access door, which is provided in the fan barrel.

Blades are of the propeller type scientifically designed and constructed of special lightweight element, cast aluminum alloy, balanced and finished to the highest degree of perfection to give a maximum capacity at a high efficiency.

CAPACITIES PENN POWER VENTILATORS

Size of Ventilator Duct, in.	Number of blades	Exhaust cubic feet per minute free air	Motor hp.	Fanspeed, r.p.m.
10	4	700	1/50	1750
12	4	1,200	1/20	1750
12	4	980	1/30	1140
16	4	3,100	1/8	1750
16	4	2,000	1/10	1140
18	4	3,600	1/6	1750
18	4	3,000	1/10	1150
18	4	2,700	1/10	860
24	4	5,700	1/4	1750
24	4	4,750	1/8	1150
24	4	4,300	1/8	860
30	4	7,000	1/3	1750
30	4	5,300	1/4	1150
30	4	4,400	1/6	860
36	2	14,000	1	1750
36	4	17,000	1½	1750
36	2	10,000	½	1150
36	4	11,500	¾	1150
36	2	6,700	⅓	860
36	4	7,500	½	860

MULTI-BLADE PRESSURE UNITS

Size, in.	Number of blades	C.f.m. free air	Static Pressure ⅛ in.	Static Pressure ¼ in.	Static Pressure ⅜ in.	Hp.	R.p.m.
12	Multi	1600	1250	....	....	1/20	1150
16	Multi	2450	1950	1625	....	⅛	1150
18	Multi	3250	2600	2000	1350	¼	1150
24	Multi	4800	4000	3200	2400	¼	850
30	Multi	7500	6350	5200	4000	½	690

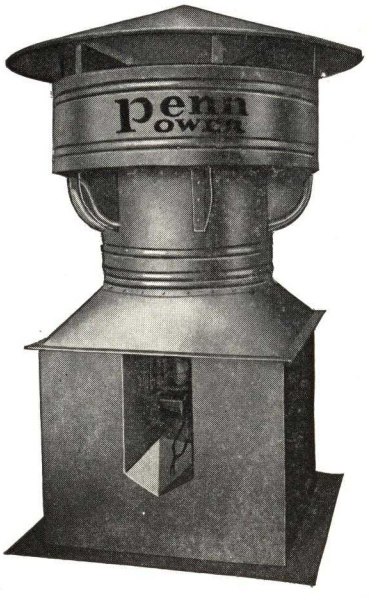
PENN POWER (Motor Isolated)

The Penn (motor isolated) Power Unit was designed to meet conditions where acids, excess heat, etc., are detrimental to the motor. Direct passage of exhaust does not come in contact with the motor, which is cooled by outside temperature and installed in a weatherproof compartment, assuring all necessary protection.

Motors are of the ball bearing type and are accessible for greasing purposes from the outside, which requires lubrication once a year.

Penn Power Units can be supplied with explosion and vaporproof motors when required by fire underwriters.

Our new edition of the Ventilator Data Book will be of vital interest to the architects and engineers and can be had upon request.



PHOENIX VENTILATOR COMPANY

1425 - 65th Street, BROOKLYN, N. Y.

PHOENIX TURBINE VENTILATOR

After years of research, Phoenix engineers have perfected a rotary ventilator which does not require oil or grease, or further maintenance after installation. The possibility of grease congealing and retarding the rotor movement, a common difficulty with turbine ventilators, is entirely eliminated. The Phoenix Turbine Ventilator is precision-built and perfectly balanced to give maximum efficiency in performance. The slightest air-current will propel the blades, creating a vacuum, thereby expelling hot and foul air, smoke and fumes. Laboratory experiments have proved that the Phoenix Turbine Ventilator has greater exhaustive capacities than many similar devices on the market.

Construction

The Phoenix Turbine Ventilator is equipped with hardened steel ball bearings, encased in self-lubricating non-metallic thrust bearings *which do not require oil or grease.* Bearings of this type have been in service for nearly thirty years, without interruption, requiring no attention or lubrication. The rotor shaft is mounted in a stainless steel stud which will not wear in operation. Mechanically perfected to prevent down-draft. The finest material and workmanship are incorporated in the ventilator, thus assuring accuracy in assembly and uniformity of the product.

Galvanized steel ventilators are coated inside and outside with the best grade marine gray weatherproof paint.

Furnished in Galvanized Steel, Cold Rolled Copper, Lead-Coated Copper, or any other metal, in any gauge.

"DUO-CONE" SYPHON VENTILATOR

The Phoenix "Duo-Cone" Syphon Ventilator assures natural ventilation, continuous and definite. It is scientifically designed to harness all passing wind currents providing maximum performance in all kinds of weather. The slightest breeze from any direction will increase its efficiency. Back-drafts are mechanically impossible.

The "Duo-Cone" Ventilator is absolutely rainproof and storm-proof, and its rugged construction will withstand all weather conditions.

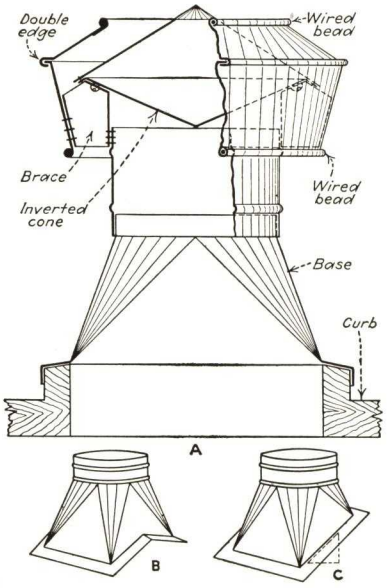
Furnished in Galvanized Steel, Cold Rolled Copper, Lead-Coated Copper, or any other metal, in any gauge.

PHOENIX TURBINE VENTILATORS

Throat diam., ins.	Galvanized, gauge	Copper, ounce	Exhaustive capacities cubic feet per hour, 20-ft. stack., 20 temp dif.	
			4 M.p.h.	8 M.p.h.
6	26-24	16	10700	16300
7	26-24	16	14430	21980
8	26-24	16	18160	27760
9	26-24	16	23860	36340
10	26-24	16	29440	45240
12	26-24	16	43800	68900
14	26-24	16	56700	86880
15	26-24	16-20	66240	100900
16	26-24	16-20	75360	114780
18	26-24	16-20	95390	145290
20	24-22	18-24	117760	179360
24	24-22	18-24	169570	258270
30	24-20	24-32	264960	403560
36	24-20	24-32	381540	581120
42	22-18	24-32	519310	790960
48	22-18	24-32	678280	1023080

"DUO-CONE" SYPHON VENTILATORS

Throat diam., ins.	Galvanized, gauge	Copper, ounce	Exhaustive capacities cubic feet per hour, 20-ft. stack., 20 temp. dif.	
			5 M.p.h.	10 M.p.h.
8	26	16	19430	30100
10	24	16	30720	47400
12	24	16	44300	69500
14	24	16	59220	91920
15	24	16	69130	106670
16	24	16	78640	121340
18	24	18	99540	153590
20	24	18	122860	189560
22	24	18	148650	229350
24	22	20	176970	273070
26	22	20	207690	320470
28	20	20	240870	371670
30	20	20	276460	426560
36	20	20	398160	614360
42	18	24	541960	836260
48	18	24	707880	1092280
60	18	24	1106040	1706640



PHOENIX BASES — SQUARE TO ROUND

Diam., ins.	Roof opening, ins.	Galvanized gauge	Copper, ounce
6	8 x 8	26	16
7	10 x 10	26	16
8	10 x 10	26	16
9	12 x 12	26	16
10	12 x 12	24	16
12	14 x 14	24	16
14	16 x 16	24	16
15	18 x 18	24	16
16	18 x 18	24	16
18	22 x 22	24	18
20	24 x 24	24	18
22	28 x 28	24	18
24	30 x 30	22	20
26	32 x 32	22	20
28	34 x 34	20	20
30	36 x 36	20	20
36	42 x 42	20	20
42	50 x 50	18	24
48	56 x 56	18	24
60	72 x 72	18	24

Fully enclosed ball bearing motors and fans furnished on specification.

H. H. ROBERTSON COMPANY

Robertson World-Wide Building System

PITTSBURGH, PA.

FACTORIES: AMBRIDGE, PA.; SARNIA, ONT., CANADA; ELLESMERE PORT, CHESHIRE, ENG.

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CINCINNATI, OHIO, H. H. Robertson Company, 1315 American Bldg.
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Products

ROBERTSON ROUND VENTILATORS; ROBERTSON RECTANGULAR VENTILATORS; ROBERTSON STREAMLINED VENTILATORS; ROBERTSON MONITOR VENTILATING ATTACHMENTS (auxiliary fan equipment available for Robertson Ventilators), ROBERTSON VENTILATOR BASES, HOODS and DUCTS, LOUVERS.

For Robertson Protected Metal (RPM), Protected Metal V-Beam Sheets, Robertson Cellular Steel Floor, Robertson Floor Wiring Method, and Weatherproof Skylights and Sash, see File Index.

TRADE-MARK

Patents

Robertson Ventilators are protected by United States Patents No. 1,589,581; No. 1,785,540; No. 1,860,367; No. 1,985,880; No. 2,009,870, and No. 2,039,486; Canadian Patent No. 244,617. Other United States patents allowed and pending; also protected by patents in other countries.

ROBERTSON ROOF VENTILATORS

The Robertson Round Ventilator

The Robertson Round Ventilator is a stationary type, of great capacity. Its height makes it possible to have free area outlets almost three and one-quarter times the stack area. This permits unobstructed passage of air. The ventilator is enclosed in a suction band which increases the area, displaces more air and causes a great *vacuum* action from passing winds. Because of the area of the free air outlets and the suction band action, it is usually possible to obtain ample ventilation with a smaller number of Robertson Ventilators than with other types with a more standard rate of discharge. *This fact should be borne in mind when figuring costs on Robertson Ventilation installations.*

Importance of Ordering by Exhaust Capacities—Ventilators are sold by sizes expressed in inches. These sizes refer to width of stack opening and not to over-all width of ventilator. However, over-all width has a direct bearing on exhaust capacities because it affects air displacement. Two ventilators of the same rated size may be greatly different in actual size. The safe way to order ventilators is by exhaust capacities.

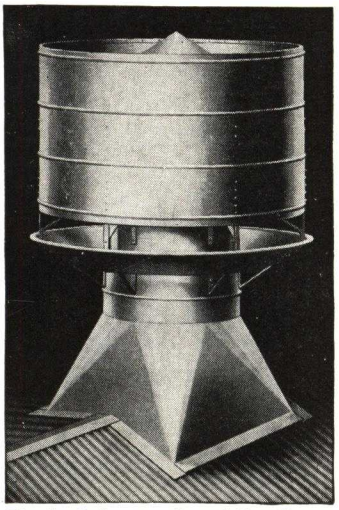


Fig. 1. Robertson Round Ventilator

Capacities of Robertson Ventilators (in actual field service) have been determined under 2250 sets of conditions. *These figures are published in a data book which will be sent on request.* Capacities of various sizes under one set of conditions are given at right.

Construction Details—Robertson Ventilators are made of Robertson Protected Metal (RPM) galvanized steel, copper, aluminum or any other suitable material. RPM is used in severely corrosive conditions. The parts are joined into a strong, rigid unit with system of bracings with bolts and lock washers. The ventilator withstands wind pressures equal to dead load of 30 lbs. per sq. ft.

Explosion Cap—For grain elevators and factories where dust explosions may occur, Robertson Rectangular Ventilators may be equipped with explosion caps. These are hinged on both sides and open in the middle to make the full area of stack available. They withstand suction of 75 m.p.h. wind velocity without opening, but will open with explosion pressure inside of 4 lbs. per sq. ft.

TYPICAL ROBERTSON VENTILATOR CAPACITIES

Wind velocity: 8 m.p.h. Difference in temperature inside and outside: 20° F. Height of ventilators above air intakes: 50 ft.

Size, in.	Discharge cap., per min., cu. ft.*	Size, in.	Discharge cap., per min., cu.ft.*	Size, in.	Discharge cap., per min., cu.ft.*	Size, in.	Discharge cap., per min., cu.ft.*
12	462	20	1499	42	5658	66	13872
14	665	24	1848	48	7398	72	16646
16	898	30	2882	54	9341	84	22472
18	1041	36	4160	60	11560	96	29358

*These figures represent *actual* measured exhaust capacities and not so-called "rated capacities."

DIMENSIONS, GAUGES AND WEIGHTS OF ROBERTSON VENTILATORS

Letters here refer to accompanying diagram

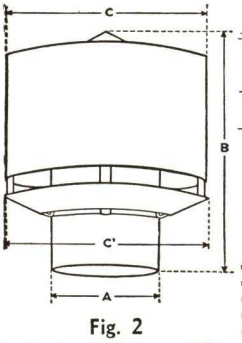


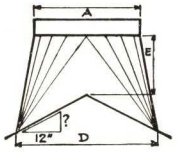
Fig. 2
Letters on diagram refer to accompanying table

Dimensions, in.				* Gauge galv. and RPM	App. net wt. lbs.		App. shpg. wt. lbs.	
A	B	C	C¹		Galv.	RPM	Galv.	RPM
12	23 5/8	22 3/8	24 1/4	24	20	46	43	81
14	27 15/16	26 1/8	29	24	31	59	57	99
16	30 15/16	30	32 7/8	24	37	70	68	125
18	34 7/8	33 7/8	36 3/4	24	48	87	84	172
20	37 3/16	37 1/4	40	24	63	103	111	209
24	46 3/16	44 7/8	48	22-24	90	160	146	357
30	56 1/4	56 3/4	60	20-22	191	247	443	529
36	66 11/16	67 3/8	72	20-22	275	358	545	647
**42	76 7/16	79 3/8	84	18-20	528	584	786	933
**48	87 1/16	90	96	18-20	635	782	1026	1219
**54	97 5/16	101 3/4	108	18-20	796	969	1219	1465
**60	107 7/8	113 1/8	119 1/8	18-20	1127	1395	1697	2052
**66	116 7/8	125 1/4	132	18-20	1360	1645	2182	2589
**72	128 1/16	135 7/8	144	18-20	1680	1995	2476	2932
**84	153 1/2	158	168	16-20	2314	2805	3146	3784
**96	175 1/8	180 3/4	192	16-20	3890	4426	4568	5426

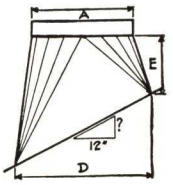
*Where two gauges are shown, heavier gauge is for stack only.
**Indicates that ventilator is shipped partially knocked down.

ROBERTSON VENTILATOR BASES

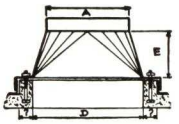
Can be furnished for any kind of roof. The types diagrammed below are commonly used. Round to square bases are strongest and are shipped unless otherwise ordered.



Type No. 1
To fit ridge of roof



Type No. 3
To fit slope of roof



Type No. 6
To fit over curb

Types 1 and 3 fit roofs of any slope. In ordering specify roof slope, type of base and kind of roof deck.

Type 6 fits concrete or wood curbs. Specify opening size and curb thickness.

DIMENSIONS, GAUGES AND WEIGHTS OF VENTILATOR BASES

Dimensions, in. Letters refer to diagrams			Gauges, RPM and galv.	App. net wt., lb.		App. shpg. wt., lb.	
Size A	Size D	Size E		Galv.	RPM	Galv.	RPM
12	16x 16	10	22	12	16	56	64
14	18x 18	10	22	18	23	63	73
16	21x 21	10	22	25	30	66	77
18	24x 24	10	22	35	40	79	90
20	28x 28	10	22	45	55	98	111
24	32x 32	10	22	55	75	106	120
30	38x 38	12	20	75	100	143	162
36	45x 45	14	20	110	140	173	200
*42	52x 52	**14	18	140	180	273	299
*48	60x 60	**15	18	190	230	432	495
*54	68x 68	**16	18	240	300	542	618
*60	78x 78	**20	18	300	380	539	627
*66	87x 87	**22	18	360	480	638	740
*72	96x 96	**24	18	460	540	841	968
*84	110x110	**26	16	660	770	1090	1221
*90	118x118	**28	16	785	920	1329	1485
96	126x126	**30	16	935	1085	1514	1689

*Ventilator base in two pieces. **Dimension E for Type No. 6 bases, 42 in. and larger, is one-half of Dimension A.

ROBERTSON FAN VENTILATORS

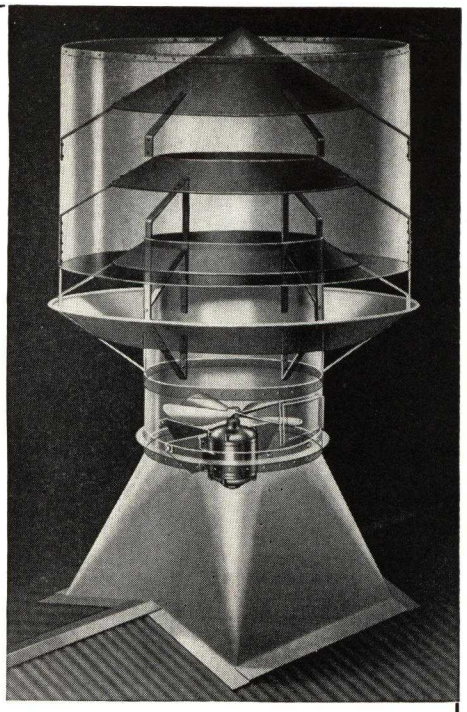


Fig. 4 Robertson Ventilator with Motor in Stack

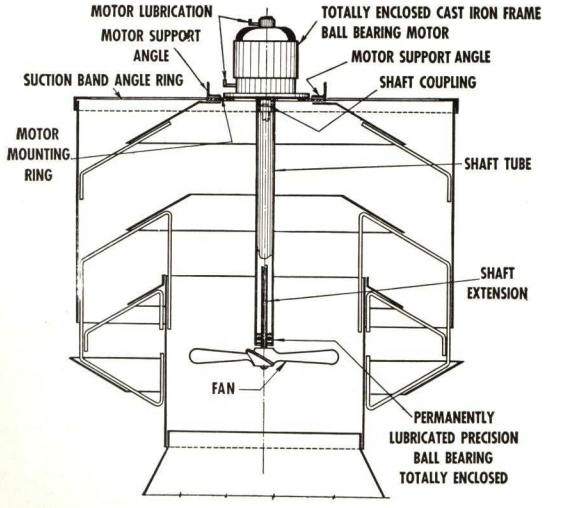


Fig. 5. Robertson Ventilator with Motor on Top of Cap

The standard Round Robertson Ventilator has long been known as the most efficient gravity-type ventilator on the market. To obtain greater flexibility for this ventilator under unfavorable atmospheric conditions and more positive ventilation at certain periods, an auxiliary power attachment may be incorporated in it. This combination is the Robertson Fan Ventilator.

Because of the scientific design of the free area outlets in the standard Robertson Ventilator, the auxiliary power attachment is able to set a new maximum for the number of cubic feet of air moved per minute per horsepower.

The power attachment is made in a separate unit and can be attached to any Robertson Ventilator, including those now installed. It also can be installed in the Robertson Rectangular Ventilator.

Motor Inside or Outside—For ordinary conditions, motor is installed in the stack, as in Fig. 4. For severely corrosive conditions, the motor is installed on top of the ventilator cap as in Fig. 5. Automatic control, providing cut-in and cut-out of motor, furnished at extra cost. Explosion-proof type motors and variable speed motors can be furnished at an extra cost.

Damper Controls—Flat, butterfly or louvre dampers can be furnished in the ventilator stack. Damper control is either (a) *hand control,* by a simple chain or gear-operated shaft connected to rack and pinion and operated by hand wheel; or (b) *electric control,* by push button or thermostat.

Low Static Pressure—Static pressure loss due to velocity in Robertson Ventilators does not exceed ⅛ in. w.g. at a velocity of 1850 l.f.m. with air temperature 70° F. and barometric pressure 29.92 in. of mercury (set level).

Lubricating Devices—Lubrication of motor by hand, from a convenient point near the floor of the building, for a single unit; or a centralized lubricating system for a series of units, can be furnished at an extra cost.

TYPICAL CAPACITIES OF ROBERTSON FAN VENTILATORS

For complete tables write for Robertson Ventilation Data Book.

Wind velocity: 6 m.p.h. Difference in temperature inside and outside: 30° F. Stack action: 50 ft.

Vent. diam., in.	Fan diam., in.	Number of fan blades	Motor hp. consumed	Total exhaust of fan and vent., cfm.	Shipping weight of fan, lb. (Fan, motor, mounting and collar)
12	10	4	1/40	662	119
14	12	4	1/40	849	134
16	14	4	1/8	1805	150
18	16	4	1/6	2368	176
20	18	4	1/4	3018	206
24	20	4	1/3	4437	223
30	26	4	1/3	6018	284
36	32	4	1	11023	322
42	38	4	1	13392	440
48	42	4	1½	18455	624
54	50	6	3	26100	920
60	54	6	3	27000	1417
66	58	6	5	39240	1560
72	60	6	7½	43911	1871
84	72	6	10	64800	2218

Table is for fans in ventilators where there is no duct in connection with installation. For static pressure data, write for Robertson Ventilation Data Book.

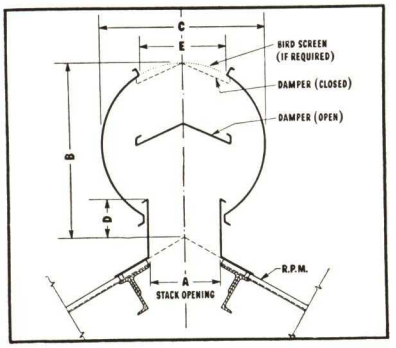
ROBERTSON STREAMLINED VENTILATORS

Robertson Streamlined Ventilators have dual advantages. They not only provide a continuous, maximum opening throughout their entire length, but also present an extremely pleasing architectural appearance.

Utilizing the knowledge and experience gained with other types of Robertson Ventilators, the H. H. ROBERTSON COMPANY has made these the most efficient continuous-opening ventilators on the market. The smaller unit (in stack sizes of 4 to 24 in., inclusive) is of revolutionary design. The larger unit (in stack sizes of 30 to 72 in., inclusive) is slightly different in design, inasmuch as certain features of the smaller unit would be uneconomical in the larger unit. However, both are equally efficient and attractive. The smaller unit is particularly well suited to mounting on Robertson Weatherproof Skylights.

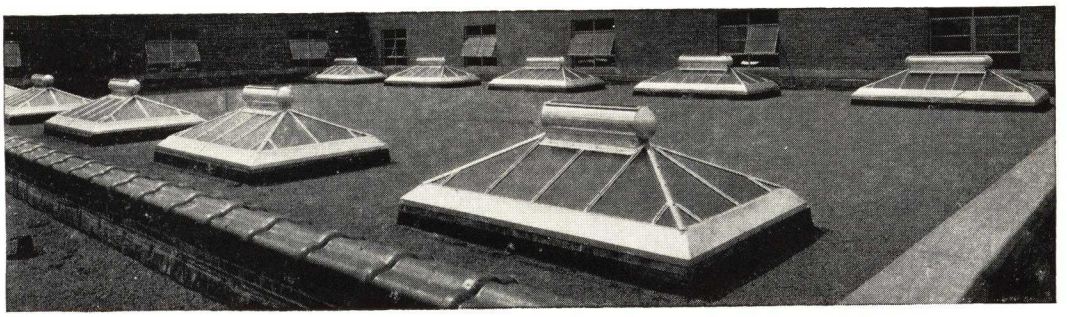
Robertson Streamlined Ventilators may be installed on any type roof. A patented damper is part of the ventilator construction. This type of ventilator is best used where heat, dust and fume conditions are constant, as its maximum opening assures their speedy exhaustion. Robertson Streamlined Ventilators are constructed to withstand a wind of eighty miles per hour velocity. They may be had in any suitable material.

(**Capacities**—*For 12 in. or larger; 90% of the total cubic feet per minute exhaust of the Robertson Round Ventilator, per square foot of Stack area (as shown in Round Ventilator tables in the Robertson Ventilation Data Book).*



SMALLER UNIT (IN STACK SIZES 4 INCHES TO 24 INCHES, INCLUSIVE)

Dimensions in inches—letters refer to diagram at left					Approx. net wt. in lbs. per lin. ft.			
A	B	C	D	E	RPM	Galv.	Copper	Aluminum
4″	8″	7″	2 3/8″	4″	3 1/2	2 1/2	2	3/4
6″	13 3/8″	11″	2 3/4″	6″	5 1/4	4	3 1/2	1 1/3
9″	22 3/8″	20 1/4″	5 1/2″	11″	10	8	6 3/4	2 2/3
12″	29″	27″	6 1/2″	15″	13 3/4	10 3/4	9	3 1/2
14″	33 1/4″	31 1/2″	7″	17″	16	12	10	4
16″	37 1/2″	36″	7 1/2″	19″	18	14	12 2/3	4 2/3
18″	46″	40 1/2″	8 3/8″	21 1/2″	20	15 1/2	13	5 1/3
20″	47 1/4″	45″	9″	24″	28 1/2	23 1/2	20	8
24″	55 1/2″	54″	10″	29″	34	28	23 1/3	9 1/3

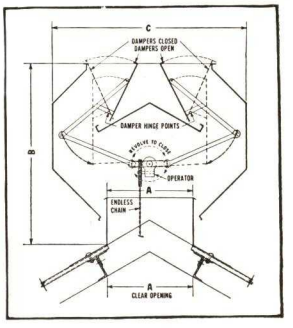


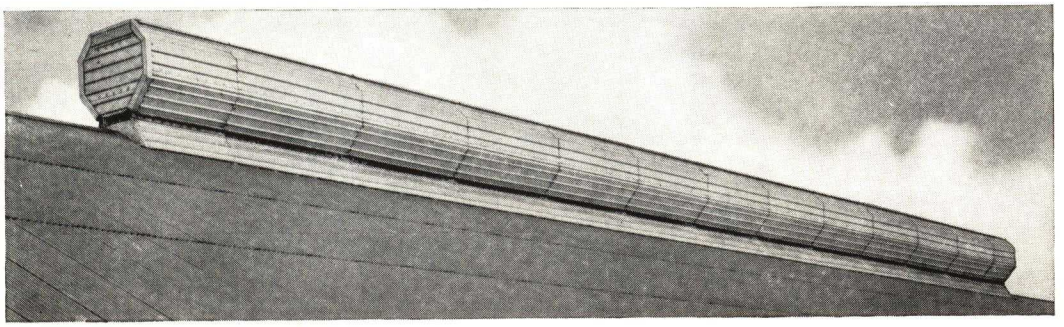
Typical Installation of Smaller Unit Robertson Streamlined Ventilators on New Building of a Large Modern Bottling Works, Pittsburgh, Pa.

17 aluminum ventilators (3 ft. 9 in. to 12 ft. 7 in. long) erected on Robertson Weatherproof Skylights, 2 copper ventilators (100 ft. long) erected directly on the flat roof (latter not shown)

LARGER UNIT (IN STACK SIZES 30 INCHES TO 72 INCHES, INCLUSIVE)

Dimensions in inches—letters refer to diagram at right				Approx. net wt. in lbs. per lin. ft.	
A	B	C	D	Galvanized	RPM
30″	60 1/2″	67 1/2″	38″	40	52
36″	72″	81″	45″	47	63
42″	83 1/2″	94 1/2″	52″	56	74
48″	95″	108″	60″	64	84
54″	106 1/2″	121 1/2″	68″	72	94
60″	118″	135″	78″	80	104
72″	141″	162″	96″	94	126





Typical Installation of a Larger Unit Robertson Streamlined Ventilator on a Furnace Building

This ventilator is 98 ft. long and is erected on the ridge of a double pitch RPM roof

MEMORANDA

ROOSEVELT SHEET METAL WORKS

Manufacturers of Automatic Gravity Stage Ventilators

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Havemeyer 4-5674

70-12 Roosevelt Avenue, WOODSIDE, N. Y.

CABLE ADDRESS
Kesswein—New York

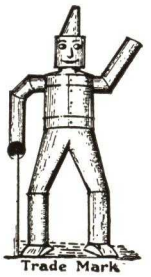
ROOSEVELT AUTOMATIC GRAVITY STAGE VENTILATOR—No. 37

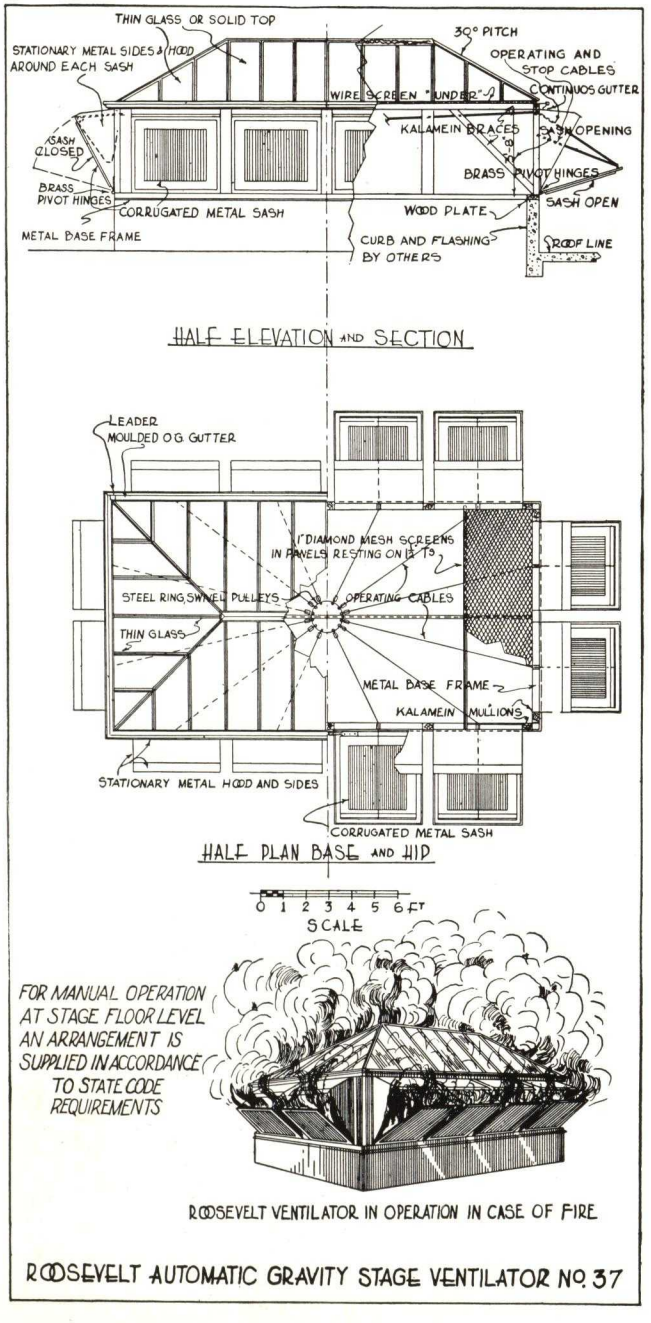
Efficient and Reliable

The Roosevelt Automatic Gravity Stage Ventilator No. 37 is recognized for its excellence, efficiency and reliability for use over stages of theaters, schools, temples, auditoriums, etc.

Construction and Installation

The Roosevelt Automatic Gravity Stage Ventilator No. 37 is made to any specified dimensions in standard gauges of galvanized iron or copper. The ventilator is delivered or shipped knock-down, ready for quick assembly in any part of the United States, Canada or Europe. A complete set of erection details accompanies each shipment. When desired, we will be glad to supervise the installation.





Operation of Automatic Gravity Stage Ventilator No. 37

A series of reinforced metal sash controlled by an individual galvanized wire operating cable, attached to the top of each sash. The other end of the cables are connected through a turnbuckle to a fusible link designed to melt at 160° F. Thus, in case of fire, melting of the link automatically releases the sash permitting it to open by gravity long before the flames reach the ventilator. To simplify operation and to reduce the number of operating manila lines required, cables from the sash are grouped in a series of varying numbers (depending on the number of sash in the ventilator) and attached to steel adjustment plates, from each of which a single manila operating line passes to the building wall and thence to the stage level. At this point the manila operating lines are attached to a specially designed locking device plate, which in turn is joined to a single rope attached to a boat cleat on the stage floor. In emergency cutting, this single rope instantly releases and opens all sash in the ventilator. For ordinary ventilating purposes, one or all of these manila lines may be released manually at the locking device.

The locking device is designed to meet the requirements of the various State codes.

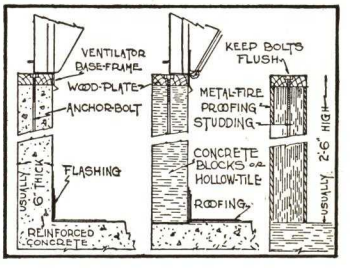
The top of the Roosevelt Automatic Gravity Stage Ventilator No. 37 is of hip skylight construction and is glazed with thin glass as prescribed by New York and other building codes. (This glass is frequently painted by the owner to exclude light.) Heat from a fire readily breaks this thin glass, the fragments falling on a U.S. No. 12 diamond wire (1-in.) mesh screen installed below the hip skylight. This feature protects those on the stage from injury and also provides additional through area for the quick escape of fumes and smoke.

The ventilator is easily mounted on a curb of ordinary construction (see detail below). The height of the curb should not be less than 2 ft. 6 in. from the finished roof so that snow drifts or other encumbrances will not interfere with the automatic outward openings by gravity of the ventilator sash. Bronze pivot type sash hinges are used to assure free action and freedom from corrosion.

Note: All dimensions of the ventilator should be outside-to-outside of the curb. Blue prints, showing detailed construction, planned to definite dimensions, furnished for architects' approval.

Other Types

In addition to the No. 37 Automatic Gravity Ventilators, we manufacture a No. 37A which is identical in design, with the exception that all construction throughout is of steel.



Detail of Curb Construction

Note: Curbs, Plates, Bolts, Fireproofing Angles, Roofing and Flashing, not in "Roosevelt" contract.

Further Information

Additional information of Roosevelt Sheet Metal products gladly supplied on request.

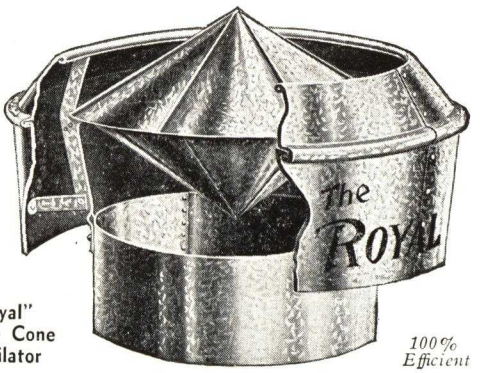
ROYAL VENTILATOR COMPANY

412 Locust Street, PHILADELPHIA, PA.

PRODUCTS

Manufacturers of "ROYAL" Double Cone Ventilators, Glass Top Ventilators, Rectangular and Square Ventilators with Fire Retarding Dampers, Insect and Bird Proof Ventilators, The "ROYAL" Fan Electric Ventilator, made of Galvanized Steel, Armco Iron, Copper, etc.

The ROYAL TRADE-MARK (Reg. U. S. Pat. Off.)



"Royal" Double Cone Ventilator

100% Efficient

"ROYAL" DOUBLE CONE VENTILATOR

The "Royal" is so designed that full advantage is taken of the wind to produce additional draft. Complete renewal of air is accomplished under the most difficult and unusual conditions by installing "Royal" Double Cone Ventilators. The many unique and original principles embodied in the design of the "Royal" make it 100% effective and insure positive ventilation under any weather condition. Tapered frustums deflect the outer air over and under the edges of the frustums resulting in a powerful suction in the tube; this means maximum exhausting capacity. Foul gases, etc., will readily pass out even when no wind is blowing. The inverted or bottom cone of the "Royal" avoids the creation of eddies, the outgoing air having a free outlet unimpeded by excess friction. The upward moving foul air, etc., strikes the inverted cone and is drawn directly upward and outward.

The "Royal" is not affected by down-drafts.

Construction—Superior and exclusive construction features include lapped seams, giving three thicknesses of metal at joints, usually the weakest point. Wired edges and galvanized malleable iron or copper stays so arranged that they cannot interfere with the passage of air currents. The double cone has standing seams and gives two thicknesses of metal instead of one.

Adapted for foundries, powerhouses, factories, as well as schools and other buildings.

Made in standard sizes 2 to 96 in.

Specification

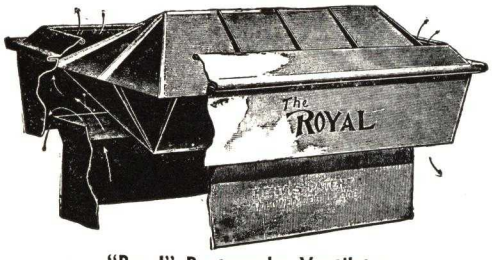
"Furnish and erect Royal Double Cone [Glass Top] Ventilators, manufactured by ROYAL VENTILATOR COMPANY, Philadelphia, Pa."

"ROYAL" DOUBLE CONE VENTILATOR DATA

Capacity Based on Test Made by Engineering Dept., University of Penna.

Size, in.	Cu. ft. exhaust per min., wind 5 miles per hour, Temp. dif. in bldg. and outside 0°	20°	Dimensions, in. A	C	E	Area, sq. in.	Gage of iron	Weight of copper, oz.
10	141	186	12	16	10	78	24	16
12	159	317	13	19	12	113	24	16
16	388	512	17	26	16	201	24	16
18	490	832	18	29	18	255	24	16
20	606	911	21	31	20	314	24	16
22	709	1059	24	34	22	380	24	18
24	874	1373	24	39	24	453	22	18
26	1005	1631	24	42	26	527	22	18
28	1186	2080	26	45	28	615	20	18
30	1364	2390	26	45	30	707	20	18
32	1551	2700	25	47	32	804	20	18
34	1765	2987	28	50	34	908	20	18
36	1961	3361	28	56	36	1017	20	18
40	2424	4124	34	61	40	1257	18	18
42	2673	4680	32	68	42	1386	18	18
44	3124	5310	35	70	44	1620	18	18
48	3489	5987	39	75	48	1809	18	20
54	5414	8304	42	84	54	2390	18	20
60	6665	9721	47	94	60	2807	18	24
66	7851	13346	52	103	66	3504	18	24
72	10682	16910	50	108	72	4071	18	24

Bases made to fit any type or pitch of roof.



"Royal" Rectangular Ventilator

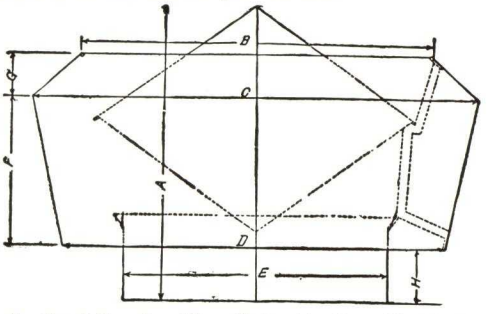
Designed to meet conditions where the maximum amount of ventilation is required at all times. Made in any desired size, with or without dampers, glass or metal top. Also made square

Cone Damper "Royal"

Used where low base is required. Lower cone is detached, slides on rod closing ventilator when lowered. Can be fitted with fusible link. Unobstructed air passage when damper is open

"Royal" Glass Top Ventilator

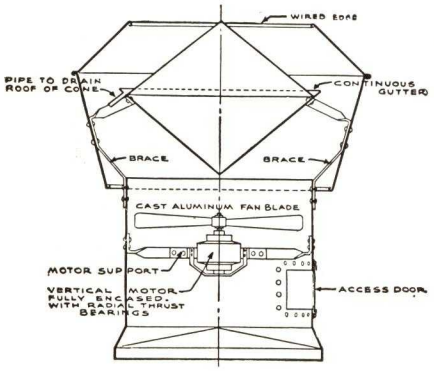
Contains a greater glass area, reflects more light, gives more ventilation. Can be fitted with damper that will not shut off light



Sectional Drawing "Royal" Double Cone Ventilator

Send for catalogue and detail card

"ROYAL" FAN VENTILATOR



The Royal Fan Ventilator is designed for buildings requiring immediate exhaust of hot air, fumes, smoke, steam, etc.

The head with Inverted Cone is similar in design to the Royal Double Cone Ventilator except that depth of cone has been increased and lower cone extended beyond upper cone. Friction is eliminated, a direct outward passage of air is assured: Upper and lower frustums have been extended to prevent outside air from entering ventilator, make same storm proof and increase capacity when motor is shut down.

Motors can be furnished for any combination of current specifications. Send for descriptive folder giving complete information

DATA ROYAL FAN VENTILATORS

Stack Size	Motor hp.	Fan speed r.p.m.	Capacity, fan and vent c.f.m. Free air	⅛" S.P.	Blade size	Number of blades
12"	1/30	1650	1110	709	12"	4
	1/30	1650	1010	600	12"	2
16"	1/30	1150	1363	.....	14"	2
	1/20	1750	1708	886	14"	2
	1/10	1740	2038	1638	14"	4
18"	1/30	1150	1910	.....	16"	2
	1/10	1150	2190	1240	16"	4
	1/10	1740	2465	1590	16"	2
	1/6	1740	3290	2420	18"	2
20"	1/20	1150	2476	.....	18"	2
	⅙	1740	3406	2536	18"	2
24"	⅛	1160	4514	2624	24"	2
	⅙	1740	5374	4374	24"	2
	⅓	1740	6424	5774	24"	4
	1/20	870	3524	.....	24"	2
30"	1/20	870	5714	.....	27"	2
	⅙	1160	6104	4264	27"	2
	⅓	1740	7964	6864	27"	2
36"	⅛	870	7886	.....	32"	2
	⅛	1160	10311	8286	32"	2
	½	1740	11261	9861	32"	2
42"	¼	870	11623	8373	36"	2
	½	1160	13833	11533	36"	2
48"	½	870	16889	13489	42"	2
	1	1160	20039	17489	42"	2

THE SWARTWOUT COMPANY

Ventilation—Industrial and Commercial

18515 Euclid Avenue, CLEVELAND, OHIO

DISTRICT OFFICES

ATLANTA, GA., 1008 Norris Bldg.
BUFFALO, N. Y., Hawkins & Howlett, 243 Capen Blvd.
CAMBRIDGE, MASS., 143 Broadway
CHICAGO, ILL., 549 W. Randolph St.
COLUMBUS, OHIO, 1085 E. 17th Ave
DAVENPORT, IOWA, 2108 Grand Ave.
DETROIT, MICH., 600 Michigan Theatre Bldg.
HOUSTON, TEX., H. T. Rieley, Lamar Annex
KANSAS CITY, MO., 106 Carmen's Bldg.
MILWAUKEE, WIS., Arno N. Dietze, Security Bldg.
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WASHINGTON, D. C., H. H. Crowell, Mills Bldg.

AGENTS IN OTHER PRINCIPAL CITIES

Swartwout Ventilators

Three types of Industrial and Commercial Building roof ventilators are manufactured by THE SWARTWOUT COMPANY. (1) Swartwout Rotary Ventilator which has been a favorite with architects for over a quarter century. (2) Swartwout AirJector, a fan ventilator of correct design and large capacity, (3) Swartwout-Dexter Heat Valve, the original continuous-opening ventilator which has become extremely popular during the last two years. In one or the other of these types you will find the ventilator that will exactly meet requirements for economical satisfactory ventilation, for smoke or fume removal, or for any other ventilation needs.

Engineering Service

A staff of competent Ventilation Engineers is maintained in principal cities throughout the country. They offer you their personal services and experience without obligation on your part. Consult the one in your locality on ventilation problems and secure his recommendations and suggestions. Substantial savings are often effected in this manner, besides you have the assurance of the proper equipment for the most satisfactory performance.

A line or telephone call to local office or direct to factory in Cleveland will bring complete data to you.

Swartwout ROTARY BALL BEARING VENTILATOR

Basically Correct Design

The object in the design of any gravity operating roof ventilator is to secure the greatest capacity per size of roof opening without an excessively large superstructure. To accomplish this the discharge flow must always be with the wind. Therefore, the discharge opening must always point only in the direction of wind travel. The rotary design alone fulfills these basic requirements. The Swartwout Rotary provides all of the following basically correct and therefore highly advantageous and desirable features.

(1) Head revolves at slightest change in wind direction but does not spin from momentum or centrifugal force.
(2) Diameter of ventilator hood is approximately same size as roof opening. This makes a neat installation, offers less wind resistance, reduces liability to damage by storms and high winds, affords sturdy construction, less weight, less roof load.
(3) Low overall height per size.
(4) Short free air passage reduces air friction and increases velocity, provides large capacity and high efficiency.
(5) No interior baffle plates, no sharp turns to retard circulation.
(6) No interior drain pipes for no snow or rain can enter the Swartwout Rotary.
(7) Maximum utilization of outside wind currents by wind play over three sides of opening. This gives positive pull in direct line of discharge.

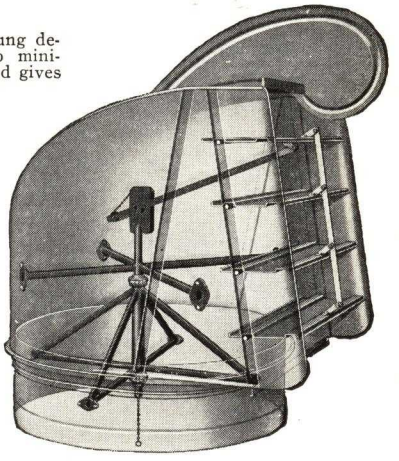
Estimated capacities based on 30 ft. stack height, 10° temperature difference and wind velocity of 5 m.p.h.

Complete capacity tables showing c.f.m. at various heights, temperatures and wind velocities given in Swartwout general ventilation catalog. Copy on request.

CAPACITY OF SWARTWOUT ROTARY VENTILATORS

Size, in.	Capacity, c.f.m.	Size, in.	Capacity, c.f.m.
12	287	36	2586
14	392	42	3519
16	512	48	4598
18	648	54	5815
20	796	60	7179
24	1148	66	8687
30	1792	72	10340

Construction



Wind Vane—New low slung design keeps overall height to minimum, enhances appearance and gives maximum stability.

Body—New curved design gives pleasing appearance. Heavy materials, rigid construction. No bolts or screws. All sizes shipped completely assembled.

Oversize Outlet—Designed after extensive experience and research to provide extra large capacity under all conditions.

Louvers—Outside adjustable louver dampers provide complete regulation of ventilation. When closed any dust or dirt is thrown outside the building.

Interior Members—Three cross braces of elliptical seamless steel tubing welded to center upright hollow steel shaft making a one-piece rigid structure of unusual strength and durability. Streamline tubing reduces friction. Interior members hot galvanized after assembly.

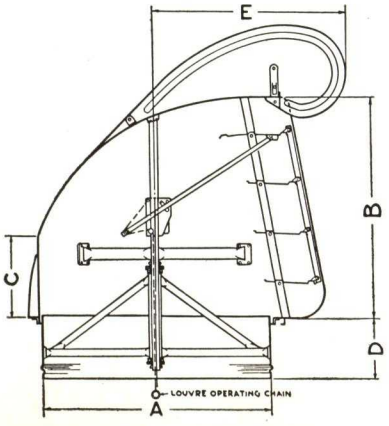
Bearings—Stainless steel ball bearings, fully enclosed dust-tight and corrosion proof, permanently sealed, oilless, trouble free.

Curved Back—Reduces wind resistance and prevents accumulation of snow or ice.

Counter Weight—Affords perfect balance with louvers.

Flared Edges—Top and both sides of outlet opening flared to divert wind currents and increase capacity.

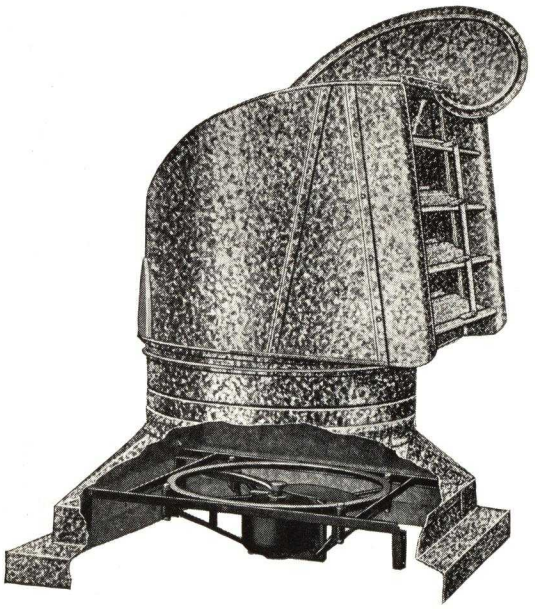
Seams—All joints are double seamed for strength and rigidity. No bolts and nothing to get loose and develop leakage.

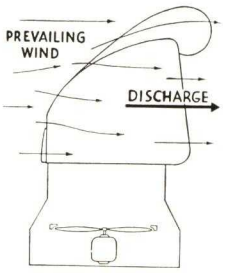


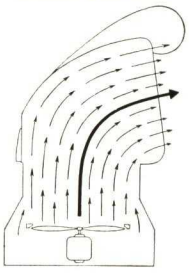
DIMENSIONS (INCHES) OF SWARTWOUT ROTARY BALL BEARING VENTILATORS

A	B	C	D	E	Area of throat opening, sq. ft.	Area of outlet opening, sq. ft.	Gauge iron	Weight of copper (oz.), lb.	Net weight, lb.
12	11 5/8	4 7/8	4 7/8	11 7/8	.785	1.03	24	18	20
14	13 5/8	5 5/8	4 7/8	13 3/4	1.069	1.39	24	18	25
16	15 1/2	6 1/4	5 3/4	15 3/4	1.396	1.83	24	18	31
18	17 1/2	6 7/8	5 3/4	16 7/8	1.767	2.30	24	18	42
20	19 1/2	7 5/8	5 3/4	18 3/4	2.182	2.84	24	18	49
24	23 1/8	8 7/8	5 3/4	19 3/8	3.142	4.00	24	20	65
30	29	11	8 3/8	26 7/8	4.909	6.33	22	24	120
36	34 3/4	13 1/8	8 3/8	31 5/8	7.069	9.02	22	24	175
42	40 5/8	15 1/8	8 3/8	36	9.621	12.40	20	28	290
48	46 3/8	17 1/8	10 3/8	41	12.51	15.92	20	28	370
54	52 1/8	19 1/4	10 3/8	47	15.90	20.09	20	28	520
60	57 7/8	21 1/4	10 3/8	52	19.63	24.82	20	28	605
66	63 5/8	23 3/8	10 3/8	57	23.76	29.93	20	28	710
72	69 3/8	25 3/8	10 3/8	63	28.27	35.53	20	28	850

Swartwout AIRJECTOR







Features

Discharge always with the wind—never against it—reducing static resistance to a minimum.

Large capacity per size of motor and ventilator and hence per power consumed.

Low operating cost.

Furnished completely assembled. Easy and inexpensive to install.

Fully enclosed ball bearing motors.

Ventilator and base regularly made of galvanized copper bearing steel. Special metals and acid resisting materials furnished when required.

Large gravity ventilation capacity when fan is not operating.

Louver dampers permit closing entirely when air movement is not desired.

The Swartwout Airjector is the standard Swartwout Rotary with a fan in the base converting the Rotary from a straight gravity to a combination power and gravity ventilator. The high efficiency of the Rotary design as described on preceding page frequently makes possible the use of a smaller motor thus effecting large savings in the cost of power over the life of the equipment.

The Airjector may be used as a gravity ventilator when fan is not operating. Gravity capacity is only slightly impaired by fan and motor.

Construction Analysis

The Swartwout Airjector embodies all the basically correct design features of the Swartwout Rotary described on the preceding page.

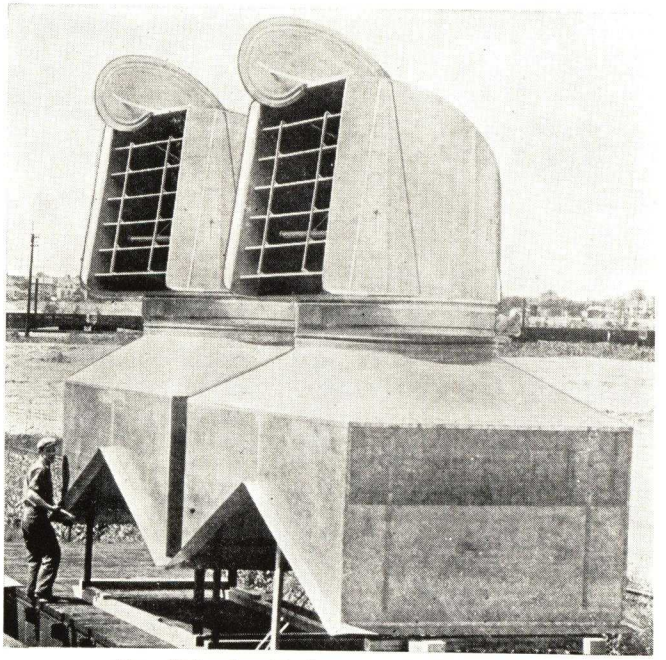
The louver dampers are opened and closed independently of the fan, and may be closed entirely when ventilation is not required. The Damper operating chain is carried to one side by a pipe guide on the inside of the base entirely clear of the fan unit.

The Motor Mounting is strong and rigid. A steel ring entirely surrounds the fan. Motor supports are connected directly to this ring which is securely bolted to the ventilator base by short connecting angles. This method of support reduces vibration to a minimum.

Air-flow guides are inserted in the collar to "straighten" flow of air as it comes from the fan and prevent any turning of the head by fan pressure. Thus the sensitivity of the head is maintained for free turning in outside wind currents and discharge leaves the ventilator in a straight, even, full, capacity flow.

Sizes and Capacities

A complete range of sizes and capacities is available. Also quiet operating and "special purpose" Airjectors The list given below is representative but does not cover the complete range. If you have a ventilation problem of any kind write for complete data and personal service.



Two 60-in. Special Airjectors for Paper Mill
Each has capacity of 50,000 c.f.m.

REPRESENTATIVE LIST OF AIRJECTOR CAPACITIES

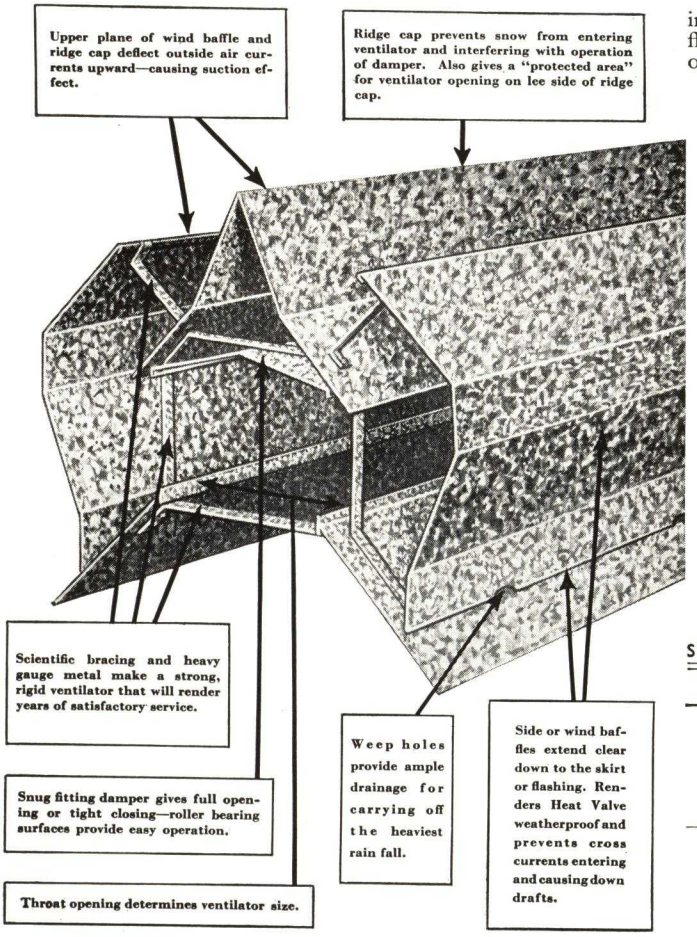
(A wide range of intermediate capacities may also be had. Write for Bulletin 204 with complete list)

Capacity, c.f.m.	Airjector number	Speed, r.p.m.	Motor, hp.	Rotary ventilator, size	Fan size	Approximate shipping weight, complete Airjector	Capacity, c.f.m.	Airjector number	Speed, r.p.m.	Motor, hp.	Rotary ventilator, size	Fan size	Approximate shipping weight, complete Airjector
1000	12T12	1725	1/20	12″	12″	117 lb.	16000	48T36	1125	1	48″	36″	710 lb.
2000	20H16	1725	1/20	20″	16″	190 lb.	20000	42T40	1125	2	42″	40″	910 lb.
3000	24H20	1725	1/20	24″	20″	233 lb.	24000	54T49	850	1	54″	49″	1340 lb.
4000	30T22	1125	1/4	30″	22″	370 lb.	28000	54T44	1125	3	54″	44″	1275 lb.
5000	30T24	850	1/4	30″	24″	375 lb.	35000	54H44	1725	5	54″	44″	1275 lb.
7000	30T28	1125	1/3	30″	28″	380 lb.	45000	60H55A	1125	5	60″	55″	1585 lb.
10000	42T31	1125	1/2	42″	31″	689 lb.	55000	66H55B	1725	7½	66″	55″	1810 lb.
12000	42H36-2	1125	1/2	42″	36″	731 lb.	60000	66H55D	1725	10	66″	55″	1960 lb.

Swartwout—DEXTER HEAT VALVE

The Swartwout Company Is Exclusive Licensee Under Pat. Nos. 1611005, 1917218 and Others Pending

The Swartwout-Dexter Heat Valve is a continuous opening roof ventilator which can be installed as one unit over the entire length of the building or in separate units of any length desired. Thus practically any required area of roof opening can be had.



Advantages

(1) Maximum roof opening at minimum cost.

(2) Large exhaust capacity per sq. ft. of opening.

(3) Utilizes outside wind currents in most efficient manner.

(4) Architecturally desirable as it (a) ties in with the building lines, (b) gets away from the "mushroom" effect, (c) on flat roofs is rarely visible, (d) on peak roofs appears as part of the building.

(5) Provides sufficient ventilation without excessive cost.

(6) Gives uniform ventilation throughout the length of the building—does away with spot effect.

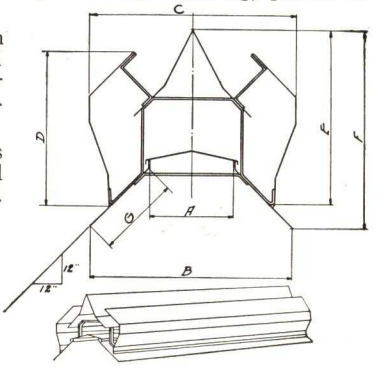
(7) Easy and inexpensive to install.

(8) May be installed on any type of roof where an opening can be made.

(9) Continuous damper permits tight closing, partial or full opening.

(10) Furnished in heavy gauge galvanized copper bearing steel or special materials if desired.

(11) No extra bases required—it is shipped complete ready to install.



SIZES AND DIMENSIONS (INCHES) OF SWARTWOUT DEXTER HEAT VALVES

Size	Gauge	A	B	C	D	E	F	G
4	24	4	11 3/4	11 1/2	8	10 1/4	12 1/4	5 1/2
6	24	6	17 7/8	14 1/2	10 7/8	12 7/8	16 1/2	8 3/8
9	24	9	22	22 3/4	15 3/4	18 1/2	21 1/2	8 7/8
12	22	12	29 1/8	29	21 1/2	24 3/8	27 1/2	12
18	20	18	38 1/2	43 3/4	29 1/2	34 3/4	37 7/8	14 1/2
24	18	24	53 3/4	58	38 3/4	46 1/4	51 1/4	21
36	18	36	73 1/2	87	59 1/4	66 1/2	70	26

Features of Design

(1) Short travel of exhaust air through ventilator. The shorter the distance from roof opening to ventilator outlet, the less friction occurs, therefore, the less resistance to air flow.

(2) Discharge through roof is directly upward with airflow through ventilator continuing in almost direct flow upward. This assures maximum capacity.

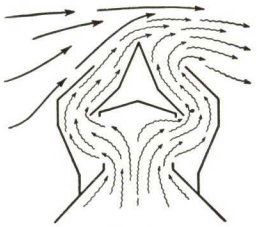


Fig. 1

(3) Low overall height of Heat Valve enhances appearance on roof.

(4) Center ridge cap extends above outside baffles thus deflecting outside wind currents upward and causing great suction effect.

(5) Side baffles start at flashing plate—not above it. There is no continuous opening under the sides to admit outside air which would replace exhausted air, retard flow, and in extreme cases cause back draft.

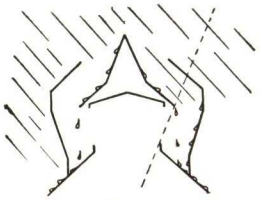
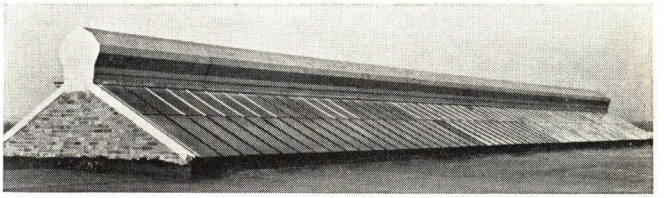


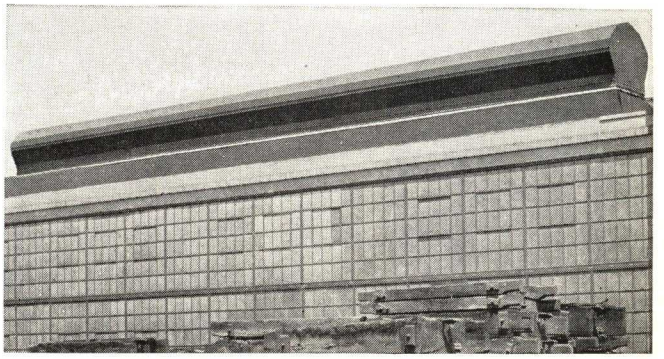
Fig. 2

(6) Damper is entirely protected by ridge cap. It operates in vertical plane—giving full opening when open and closes tightly when closed, without heat loss through cracks.

(7) Completely watertight and weatherproof—Baffles prevent rain or snow entering building. Drainage is provided by small weep holes in base of side baffles. Continuous ventilation is afforded in all kinds of weather.



Typical Skylight Installation



Typical Industrial Building Installation

UNO VENTILATOR COMPANY

Manufacturers of Electric Welded Ventilators

OFFICE AND WORKS

CLIFTONDALE STATION, SAUGUS, MASS.

THE UNO COMPANY AND ITS PRODUCTS

The UNO VENTILATOR COMPANY was established in 1906. During the life of the Company thousands of Uno Ventilators have been manufactured and distributed through the prominent metal jobbers of the country, for installation on every type of building, including industrial plants, churches, theatres, restaurants, garages, etc.

No one ventilator can possibly be the satisfactory answer to every ventilating problem. Results desired and local conditions necessarily control the selection of proper equipment. For this reason UNO manufactures a complete line of ventilators as described below.

UNO STANDARD TURBINE

Wind-Driven Type

The Uno Standard Turbine Ventilator is the original turbine.

The moving breeze, whirling the head at no operating cost, causes such a powerful upward lift to the air column below, as to raise solid matter.

The Uno Standard has the highest of duct velocities. Its guaranteed exhaustive capacities have been determined by the equipment of the foremost technical institute of the country, in conjunction with the services of outstanding engineers.

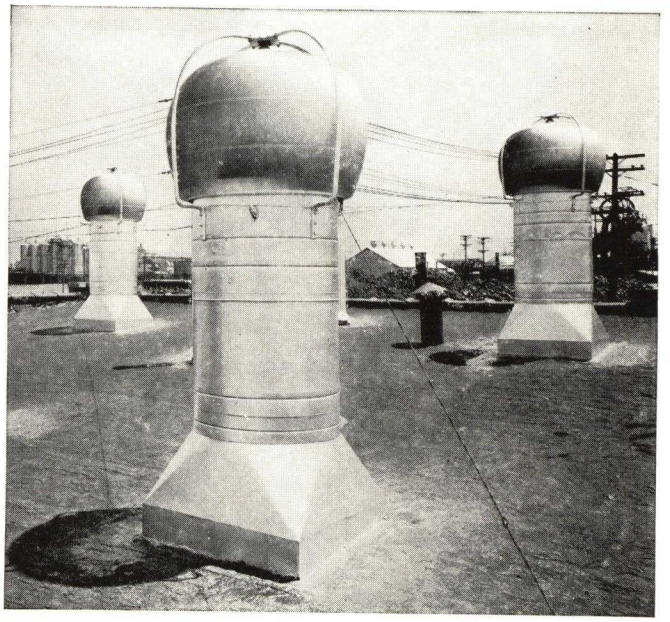
Every mechanical precaution has been taken to make the Uno Standard absolutely rigid in any gale. Extra strong steel braces, securely welded to steel reinforcing bands on the inside of the body (an exclusive UNO feature) support the whirling head.

Patented bearings, needing no lubrication, give quiet, long life, like a high grade watch.

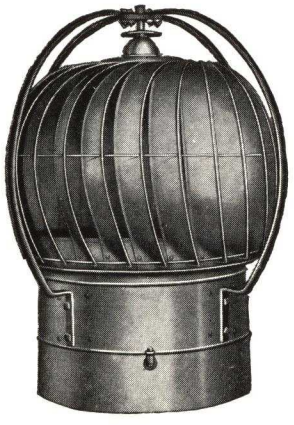
Sizes 18 in. and up carry extra inbuilt propellers, revolving with the head, to give added suction.

The Uno Standard is infallible in its exhaustion, whether the air be hot or cold, damp or dry, dirty or clean.

Available in galvanized iron or copper.

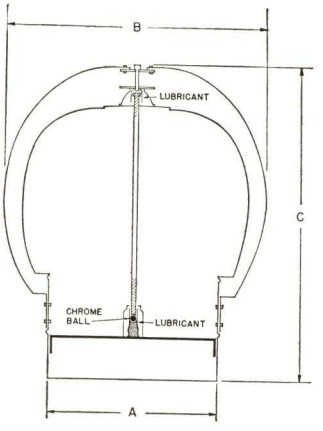


Gulf Refining Co., Refinery, Toledo, Ohio
GULF OIL CORP., Engineers, Pittsburgh, Pa.



CAPACITIES, DIMENSIONS AND WEIGHTS

Diam. body, in.	Exhaustive Cap. (cu. ft. per hr.)		Dimensions, in.			Approx. weight packed, lb.
	4 mi. breeze	8 mi. breeze	A	B	C	
8	16,800	20,500	8	14	18	25
9	22,400	28,300	9	15	19	27
10	26,500	32,500	10	16	20	30
12	39,000	47,000	12	18	23	33
14	41,000	48,100	14	20	25	45
15	52,500	67,500	15	21	26	50
16	60,000	72,000	16	22	27	55
18	87,000	103,000	18	24	32	72
20	105,100	125,600	20	26	35	88
21	115,000	128,000	21	28	37	100
24	151,000	187,000	24	33	40	120
30	225,000	272,000	30	41	53	275
36	285,000	332,000	36	48	60	325

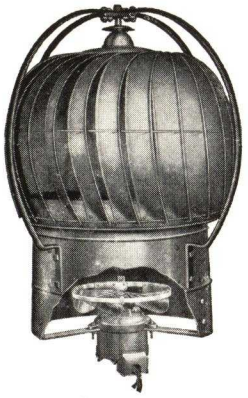


STANDARD SPECIFICATIONS FOR UNO VENTILATORS

The roof ventilators shall be Uno..... of standard construction as manufactured by the UNO VENTILATOR COMPANY, Cliftondale, Mass. Sizes shall be as shown on plans. All ventilators shall be of standard weights of galvanized iron (or copper) as used by the UNO VENTILATOR COMPANY. Metal bases supporting the ventilators shall incorporate drip gutters to carry off condensation.

UNO MOTOTURB

Driven by Wind and with Auxiliary Motor Fan

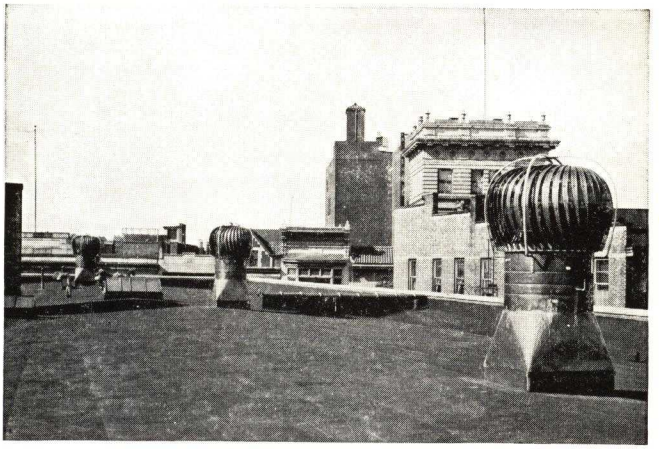


Many ventilating problems demand the assured lifting power of a turbine, with guaranteed exhaustion, irrespective of wind velocity.

When there is a wind, the Uno spins with no operating cost, at the rated capacity of the Uno Standard as scheduled.

When there is a dead calm, switching on the motor fan spins the head, thus creating its own constant exhaustion, and the combination of the spinning turbine head and the operating motor fan, increases the exhaustive capacities two to three times those indicated in the Uno Standard capacity schedule.

There are no gears, clutches, or belting systems, etc., therefore there is no load to be lugged when the unit is spun solely by the wind. The motor is entirely enclosed within the duct, and is impervious to all weather conditions, in both winter and summer. This combination assures the user of quiet, guaranteed exhaustion under any wind conditions, at low cost. Prices quoted depend on the local current, local voltage, and other operating conditions. Ask for further information.



Metropolitan Life Insurance Co., Schenectady, N. Y.
R. L. Bowen, Schenectady, N. Y., Architect
Installed by G. E. Van Vorst Co., Scotia, N. Y.

UNO FLUE DOCTOR

The Uno Flue Doctor, in sizes 4 to 18 in., is designed to fill the turbine demand where price is paramount. It creates drafts in poor chimneys, prevents down-drafts in flues, and affords protection to oil burners and gas pilots.

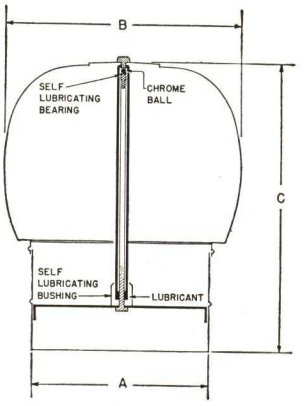
This braceless turbine has proven a great boon in all marine circles for rectifying drafts in galley flues, ventilating cabins, and exhausting fumes in bilges. Many insurance rates have been lessened by its use.

It is an excellent medium for ventilating all average spaces, such as poultry houses, garages, restaurants, stores, attics, etc.

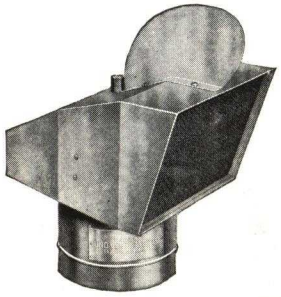
A braceless unit of sturdy construction, it requires no lubrication. Sensitive to the lightest breeze.

CAPACITIES, DIMENSIONS AND WEIGHTS

Diam. body, in.	Exhaustive Cap. (cu. ft. per hr.)		Dimensions, in.			Approx. weight packed, lb.
	4 mi. breeze	8 mi. breeze	A	B	C	
4	8,000	10,000	4	7	11	7
6	10,400	14,100	6	10	13	9
7	13,500	17,400	7	11	14	10
8	16,800	20,500	8	13	16	19
9	22,400	28,300	9	14	17	22
10	26,500	32,500	10	15	19	24
12	39,000	47,000	12	17	22	26
14	41,000	48,100	14	20	23	30
15	52,500	67,500	15	21	24	33
16	60,000	72,000	16	22	25	37
18	87,000	103,000	18	24	28	50



UNO ROTOHOOD



Uno Rotohood Ventilator, a swinging hood unit, operates efficiently and quietly at no cost.

Revolving on sensitive bearings, it always faces away from the wind, and moving air currents cause a continuous suction in the mouth, resulting in an upward flow of air through the duct. The opening is guarded with metal screening against ingress of birds, insects, flying snow, etc. Standard sizes to 48 in.

UNO ARROW STATIONARY

Especially suitable for skylights, stores, attics, factories, stables, dairies, garages, etc.

Uno Arrow Ventilator combines two unusual features—extreme merit and low price. Standard sizes to 48 in.

Through its siphoning principle, and its shield of triple cones, no down-drafts can possibly enter the duct. It is, therefore, especially efficient under poor local conditions, like obstructing buildings, neighboring walls, trees, etc., where the moving breeze cannot reach and spin a turbine.

WESTERN ENGINEERING & MANUFACTURING COMPANY

FORMERLY WESTERN ROTARY VENTILATOR CO.

1728 E. Washington Boulevard
LOS ANGELES, CALIF.

401 North Peoria Street
CHICAGO, ILL.

DISTRIBUTORS

DALLAS, TEX., J. L. O'Hearn Co., 630 Wilson Bldg.
DENVER, COLO., W. H. Dawson Co., 850 Santa Fe Drive
HONOLULU, T. H., The von Hamm-Young Co., Ltd.
HOUSTON, TEX., The Tennison Mfg. Co.
KANSAS CITY, MO., Lewis P. Heaven, 1304 McGee St.
NASHVILLE, TENN., E. T. Kirkpatrick Co., 6 Berger Bldg.
PHOENIX, ARIZ., Phoenix Roofing & Supply Co.
PORTLAND, ORE., Ray F. Becker Co., 685 No. Page St.
SAN ANTONIO, TEX., Marschall-Hart Supply Co.
SAN DIEGO, CALIF., Christenson-Campbell Co., 742 First Ave.
SAN FRANCISCO, CALIF., The Cookson Co., 964-68 Harrison St
SEATTLE, WASH., Puget Sound Sheet Metal Wks.

Products

WESTERN ROTARY (Turbine) VENTILATORS
WESTERN FAN VENTILATORS

Also Forbes Syphonaire (Stationary) Ventilators and Forbes Tri-Peller Exhaust Fans.

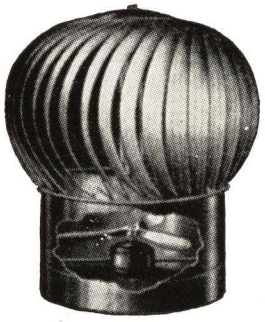
QUALITY VENTILATORS TO MEET ALL CONDITIONS

Western Rotary Turbine Ventilators

A turbine ventilator that is efficient at a very low wind velocity, symmetrical in design, silent in operation, and reasonable in cost.

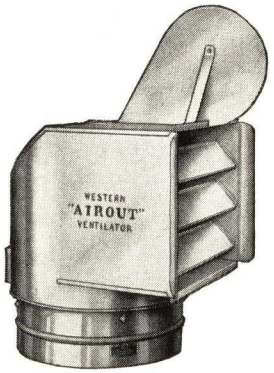
The turbine revolves around a central support-shaft upon almost frictionless bearings, floating in a bath of oil and graphite and sealed against dust, dirt, steam and smoke.

This exhaust fan derives its power from wind at two miles an hour, creating a centrifugal action through its turbine construction, forcing a steady circulation and aiding natural action by the mechanical lift of this revolving head.



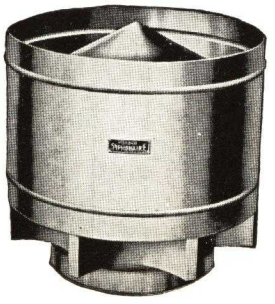
Western Fan Ventilators

One complete machine gives *forced draft* and *gravity* ventilation—a ventilating unit that will operate efficiently at no cost when the outside temperature is normal; an exhaust fan of high efficiency when wind velocity is low and humidity and temperature are high. Operates from light circuit at very low power cost. Any job needing an exhaust fan can use this unit to advantage through a saving in power cost, flexible operation and cost of installation. No penthouse necessary. Excellent exhaust at no power cost through turbine head. Motors fully enclosed with thrust bearing for vertical shaft mounting. Propellers of cast aluminum, polished and carefully balanced.



Western Airout Rotary Ventilator

A directional ventilator well engineered, perfectly balanced and ball-bearing equipped. Counterbalanced for easy operation, will change with wind direction at slightest pressure. One-mile wind velocity operates it. Bearings sealed against dust, dirt and moisture; oiling practically unnecessary. Heads instantly removed without tools, making installation and inspection very simple. If fan unit is to be added, specify Western Airout *Fan* Ventilator. Exhaust capacities and sizes same as shown under Western *Fan* Ventilator. Support members of heavy welded steel design and, as in all our ventilators, bearings guaranteed for life of ventilator.



Forbes Syphonaire Ventilator

Engineered to supply the market for a stationary unit of highly efficient design; worthy companion to our rotary units. Construction simple and sturdy. Second to none—friction minimum and syphonage of highest degree. Note exceedingly wide wind band, top plate, and assisting louver construction. At base of wind band a series of louvers or syphons pocket the slightest breeze, forcing it up past the stack, creating a syphonage at that point, in addition to the syphonage created at the top. Fan unit can also be obtained with this ventilator by specifying Forbes Syphonaire *Fan* Ventilator. Sizes 12 in. through 30 in.

SIZE, HEIGHT, GAUGES, WEIGHTS, ETC., OF VARIOUS UNITS

Stock sizes, in.	Air displacement 4 mi. per hr. velocity, cu. ft. per hr.	Height, in.	Weights, lb., crated	Gauge of iron	R.p.m. 60-cycle	Motor hp.
Western Rotary Turbine Ventilators						
6	14,360	12	12	26	.....	.....
8	17,400	12	15	26	.....	.....
10	26,100	15	20	26	.....	.....
12	38,300	18	26	26	.....	.....
14	43,200	22	35	24	.....	.....
16	50,000	24	45	24	.....	.....
18	76,310	28	53	24	.....	.....
20	109,200	31	63	24	.....	.....
24	149,000	36	105	24	.....	.....
30	230,000	42	150	22	.....	.....
36	300,000	52	210	22	.....	.....
42	376,000	62	250	20	.....	.....
Western Fan Ventilators						
12	*1300	.....	35	.....	1725	1/20
14	*1530	.....	40	.....	1725	1/20
16	*1710	.....	55	.....	1140	1/15
18	*2070	.....	60	.....	1140	1/15
20	*2740	.....	70	.....	1140	1/8
24	*3540	.....	125	.....	1140	1/8
30	*5000	.....	175	.....	1140	1/6
Western Airout Ventilators						
8	12,000	10	15	26	.....	.....
10	13,500	12	20	26	.....	.....
12	17,000	15	26	26	.....	.....
14	23,400	22	35	24	.....	.....
16	32,000	24	45	24	.....	.....
18	41,000	28	55	24	.....	.....
20	51,300	30	63	24	.....	.....
24	72,600	36	105	24-22	.....	.....
30	121,800	40	150	24-22	.....	.....
36	180,000	50	200	22-20	.....	.....
42	241,900	58	250	22-20	.....	.....
Forbes Syphonaire Ventilators						
8	10,440	12	16	26	.....	.....
10	15,660	15	23	26	.....	.....
12	22,980	18	29	26	.....	.....
14	25,920	21	35	24	.....	.....
16	30,000	24	52	24	.....	.....
18	46,586	27	63	24	.....	.....
20	65,520	30	74	24	.....	.....
24	89,400	36	105	24	.....	.....
30	138,000	45	150	22	.....	.....
36	186,000	54	225	22	.....	.....
42	240,000	63	275	20	.....	.....
48	310,000	72	400	20	.....	.....

Note: Furnished in all metals. More complete information on request. Fan unit furnished for Western Airout and Syphonaire Ventilators. Prices and discounts on application. *R.p.m.—cu. ft. per min. on 60 cycle current.

Specifications

Contractor will furnish and erect..... ..... type ventilator in sizes as shown and where shown on plans, to be as manufactured by WESTERN ENGINEERING & MANUFACTURING COMPANY, Los Angeles, Calif. or 401 No. Peoria Street, Chicago, Ill.

ADJUSTABLE LOUVER CORPORATION

Manufacturers of Air-Trol Louvers
1425 65th Street
BROOKLYN, N. Y.

TELEPHONE
BEnsonhurst 6-6248

INSULATING VALUE OF CONTROLLED VENTILATION

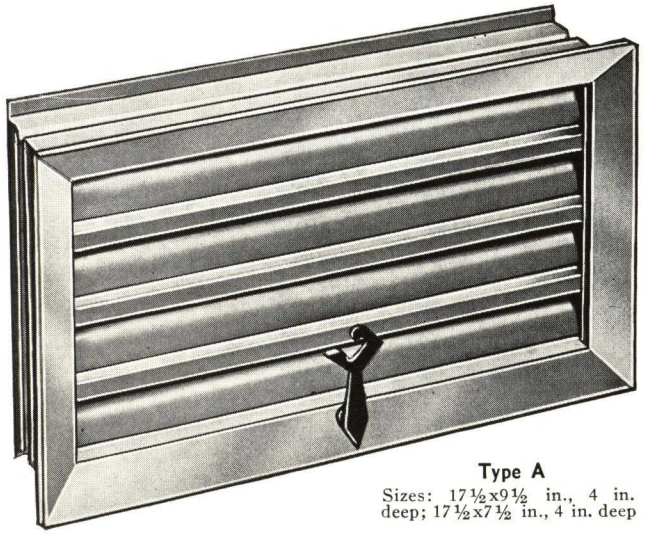
AIR-TROL LOUVERS

The two most important factors for the successful operation and maintenance of the apartment building and dwelling are fuel economy and tenant comfort.

To favorably solve these two problems it is absolutely essential to obtain positive control of the ventilation of dead air spaces in hanging ceilings, attics, foundations, and all other shallow or dead-end spaces in the structure.

The fact that insulation by rock wool, insulating board, cork and other similar materials alone is not sufficient is subscribed to by manufacturers of these products.

They recommend the installation of proper ventilating methods for dead air spaces as definitely increasing the effectiveness of such products.



Type A
Sizes: 17½x9½ in., 4 in. deep; 17½x7½ in., 4 in. deep

Advantages of the Air-Trol Louvers

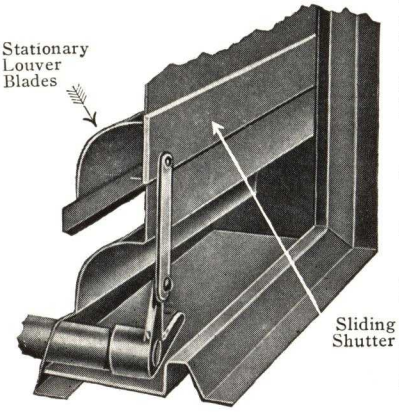
Air-Trol Louvers provide maximum ventilation in hanging ceilings, attics, foundations, and other dead air spaces during the summer months thereby clearing out hot, trapped air. They may be readily closed during the winter months by simply shifting the lever a quarter turn, bringing the shutter to a closed position. Outside air is thus eliminated and fuel costs materially reduced. Many top floor apartments are made as comfortable in summer by this method as those on center floors, and rental losses are thus avoided.

Where to Install

Air-Trol Louvers should be specified for through-wall ventilation of hanging ceilings, attics, foundations, store fronts, dark rooms, storage rooms, basements or any other space where cut-off ventilation is desired. They may be installed in any type of conventional wood or masonry construction.

Construction

Air-Trol Louvers are manufactured of heavy gauge sheet bronze with deep reinforced frame. The louver blades are rigid and stationary and are not affected by the operation of the shutter. They are so designed as to preclude the entrance of rain or snow when the louver is open. When used in brick or concrete construction, the mortar-binder—an exclusive feature—prevents shifting or loosening in the wall. The simple mechanism is operated manually without effort, requires no lubrication and cannot lock or jam.



Shutter Control
Frictionless one-piece shutter requires no lubrication; cannot lock or jam

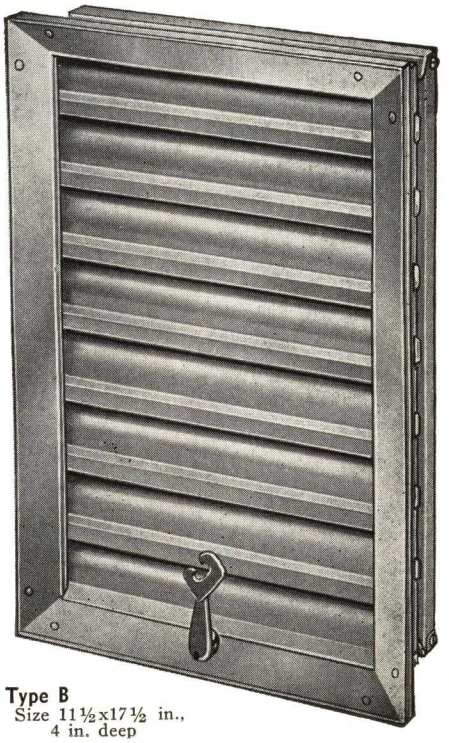
Approval

Air-Trol Louvers are approved by the City of New York Bureau of Buildings.

Specifications

Wall louvers with stationary louver blades and movable shutter in rear, operated from face [rear] by means of lever.

Air-Trol Louvers as manufactured by ADJUSTABLE LOUVER CORPORATION, Brooklyn, New York.



Type B
Size 11½x17½ in., 4 in. deep

ESTABLISHED 1906

AREX COMPANY

Industrial Ventilating Engineers

333 Michigan Avenue Building, CHICAGO, ILL.

AGENCIES IN PRINCIPAL CITIES

FACTORY AND WAREHOUSE: GARY, IND.

FOR VENTILATORS, SEE FILE INDEX

Arex Original Accelerated Louvers

Adaptability—These high grade louvers are installed for fresh air supply in connection with any heating and ventilating system in factories, power plants, public buildings, transformer vaults, etc.

This louver is absolutely stormproof and weatherproof and is furnished with jamb style to suit requirements. Fabricated of all metals and in all sizes. Louvers can be furnished with bird or insect screens.

Construction Features—(1) Bronze bearing in frame. (2) Bronze pivots in blades. (3) Bronze setscrews and slide. (4) Adjustable device to lock in any position. (5) Standard depth 4 in. for any brick or concrete wall. (6) Perfectly balanced. (7) Furnished with friction control, fusible link control or for operation by thermostatic control with ball bearings and necessary lever connections. (8) Standard louvers have No. 18 ga. galvanized iron in frames and No. 16 ga. galvanized iron in blades; copper 32 oz. in frame and 48 oz. in blades.

Special Louvers Built for Glass Block Walls—Special frames constructed especially for *glass block wall* installations.

Arex Stationary Louvers

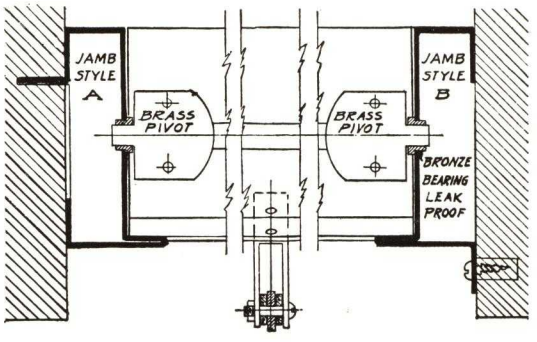
Absolutely stormproof and weatherproof; furnished with jamb style to suit requirements. Louver blades are riveted to frame and bottom fins are riveted and soldered to make the unit watertight.

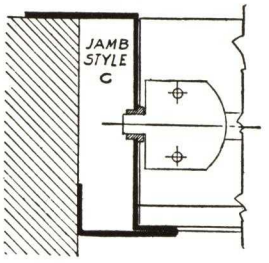
Standard galvanized louvers are fabricated of No. 22 gauge and in copper 20 oz. Louvers over 48 in. wide have center stiffener support for blades. Also can be furnished in other metals and heavier gauges. Standard louver depth is 4 in. Special frames constructed for glass block wall installation.

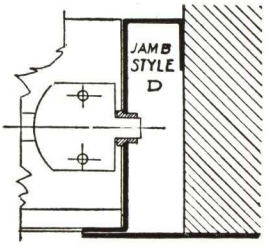
Four different style jambs can be furnished to suit requirements as shown below. The same jambs apply for the stationary louvers. Galvanized and copper bird or insect screens can be furnished.

Specifications

All louvers to be Arin Accelerant or Arin Stationary Louvers as manufactured by Arex Company, 333 North Michigan Avenue, Chicago, Illinois.

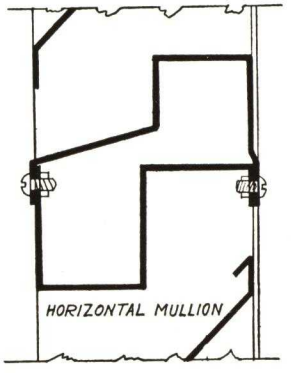


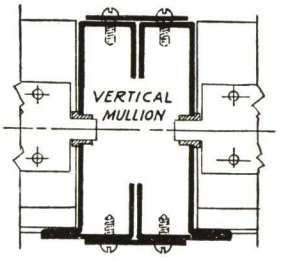


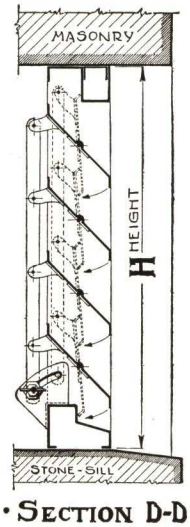


Note—Any size opening can be filled with additional mullions and units, louver blades to be not over 48 in. in length and maximum height approximately 84 in.

These louvers are designed for outside walls and are water tight and stormproof in any position from opened to closed.

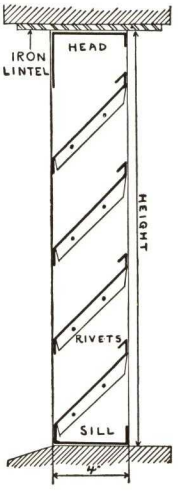






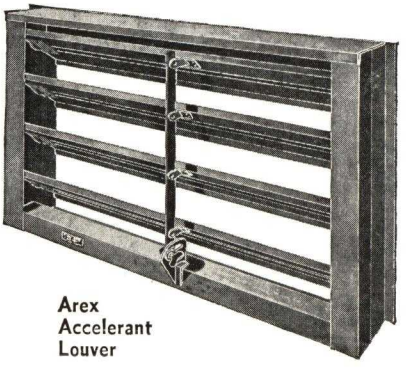
• SECTION D-D •

Adjustable Louver

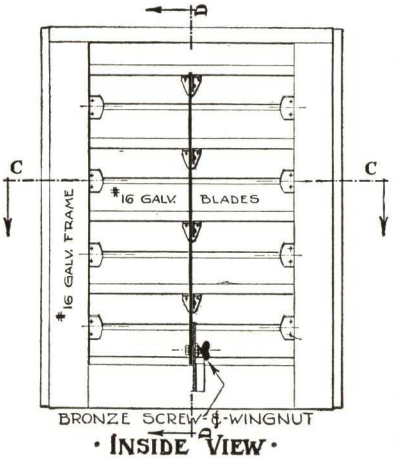


Stationary Louver

Side View



Arex Accelerant Louver



• INSIDE VIEW •

CONSTRUCTION DETAILS OF AREX LOUVERS

ATLANTIC STEEL COMPANY

Correct Ventilation for Underneath Buildings

ATLANTA, GA.

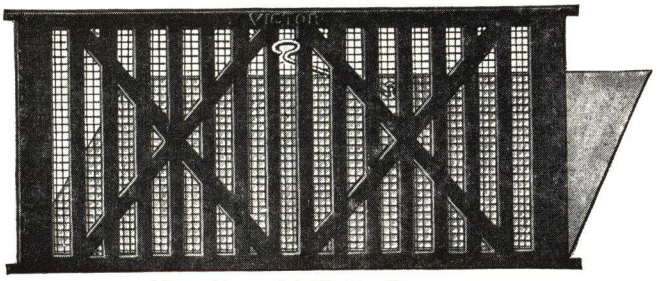
Distributors for New York, New Jersey and Connecticut: J. W. FISKE IRON WORKS, 78-80 Park Place, New York, N. Y.

VENTILATORS FOR FOUNDATIONS AND BRICK WALLS

Correct building ventilation will protect buildings against dry-rot. Ernest G. Blake, M.R.S.I., noted authority on timber, sums up dry-rot as follows:

"One of the greatest enemies of timber . . . a highly infectious fungoid disease caused by the action of a vegetable parasite operating under suitable conditions . . . the four conditions necessary for germination and development are dampness, stagnant air, warmth and darkness."

The Victor Vent is a complete unit offering building ventilation with safety — safety from the ravages of dry-rot, rodents, reptiles and insects.

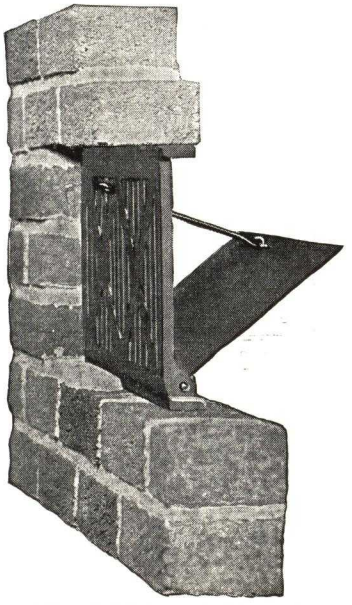


Victor Vent with Shutter Open

Victor Vent with Shutter Closed

Construction—The Victor Vent is neatly and strongly made of cast iron—a single casting, 9x16 in. over all, with an arch bar over an inch in width to provide sturdy support for brickwork above. The vent face is divided into two parts, each side carrying six ½-in. bars, spaced ½ in. apart, and reinforced with cross bars on each side, adding extreme reinforcement and lending ornament to design. All vents are dipped in black paint.

Protection against reptiles, rodents and larger insects is afforded to buildings equipped with the Victor Vent by a non-rust 8x8 mesh galvanized hardware screen riveted to back of vent.



Showing Method of Victor Vent Installation in Brick Wall

Operation — The novel feature of the Victor Vent is the shutter. Operating on a rolled hinge and made of sheet iron, the shutter is hinged to the bottom of the casting and attached to a push rod which extends through the frame. Ample ventilation is afforded by pushing in rod which causes the shutter to fall back. The shutter may be closed from the outside by simply pulling out the push rod and allowing it to hang down, its leverage and weight providing an efficient fastener.

Installation — The Victor Vent has been designed for neat and speedy installation. No unsightly seams, joints or cracks mar the appearance of your brick wall when installed. The top arch bar and two bottom lugs extending from the frame are the same thickness as the mortar joint. They are over an inch in width, of very strong construction and will support all necessary brickwork above.

The width and height of the ventilator frame have been carefully calculated by a practical architect and will permit its insertion into new buildings without any unnecessary brickwork.

Specification for the Victor Vent

All ventilators used below buildings shall be Victor Vents of the standard construction of the ATLANTIC STEEL COMPANY, Atlanta, Georgia.

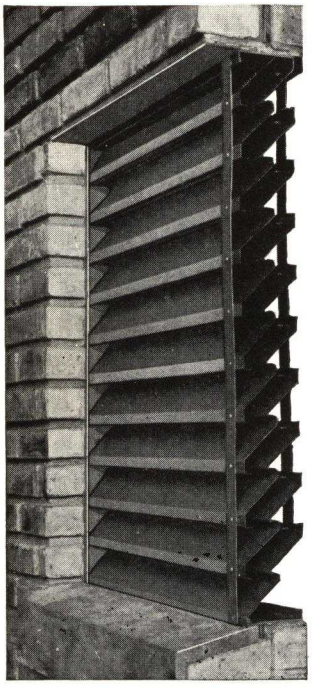
AMERICAN SHEET METAL WORKS

Manufacturers of Hoal's Louvers (Patented); Crescent Skylights, Hollow Metal Windows; Fire Doors and Shutters, Bronze and Aluminum Doors; Combination Pressed Steel Frames and Trim

331 North Alexander Street
NEW ORLEANS, LA.
TELEPHONE, GALVEZ 3191

132 Nassau Street
NEW YORK, N. Y.
TELEPHONE, BEekman 3-3448

EASTERN OFFICE AND TERRITORY: 132 Nassau Street, New York, N. Y.—BEekman 3-3448



Section Through Louver Showing Leakproof Construction

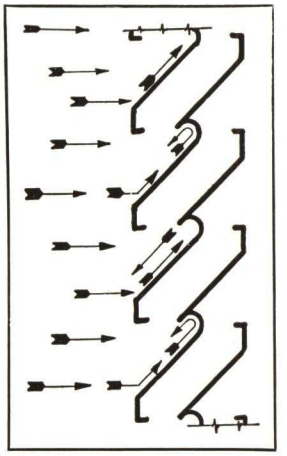
HOAL'S ALL-METAL LOUVERS FOR MASONRY AND GLASS BLOCK WALLS

A louver that really keeps out the rain and, at the same time, gives proper ventilation, has been a dire need in building construction for many years. This need is now fully taken care of with Hoal's Leakproof Louver.

A moment's examination of the diagram at the right will explain the working principle of Hoal's Louver and show how it checkmates the rain perfectly. The arrows show the rain is driven against the louver, how it is caught and turned back to drain off the outside of the building. Like many other revolutionary devices, Hoal's Louver is as simple as it is efficient.

Features of Hoal's Louver Construction:

(1) All-metal. No wooden frame.
(2) Hoal's Louver is made in a rigid manner. Blades riveted to frame eliminating solder and properly braced to withstand wind pressure of the severest kind.
(3) Buildings equipped with Hoal's Louvers can never be damaged even in the severest of rain or snow storm.
(4) Hoal's Louver is made of copper bearing galvanized steel, copper, aluminum, monel, stainless steel and acid-resisting alloy steel.
(5) Hoal's Louver is manufactured to fit any size wall opening and of architectural designs such as shown in diagram below.
(6) Jambs are made in any type to securely anchor louver to any type wall construction as shown in illustration.
(7) Standard Hoal's Louvers are made of 26-gauge copper bearing steel and 16-oz. cold rolled copper, for all types, with the exception of louvers for glass block wall, which, in addition to the usual frame for louvers, they have a sub-frame of heavier galvanized materials and lead coated steel for copper louvers. Blade design and construction materially strengthens the slats, making it possible to use lighter material than that required for ordinary louvers. However, heavier materials can be furnished if so desired.



How Hoal's Leakproof Louver Checkmates Rain

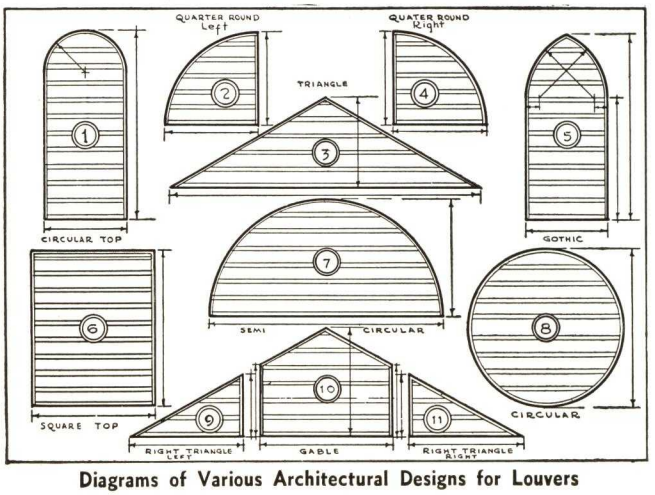
Engineering Service

Our Engineering Department is at your service in offering suggestions and in solving your problems of adapting louvers to any type of construction desired.

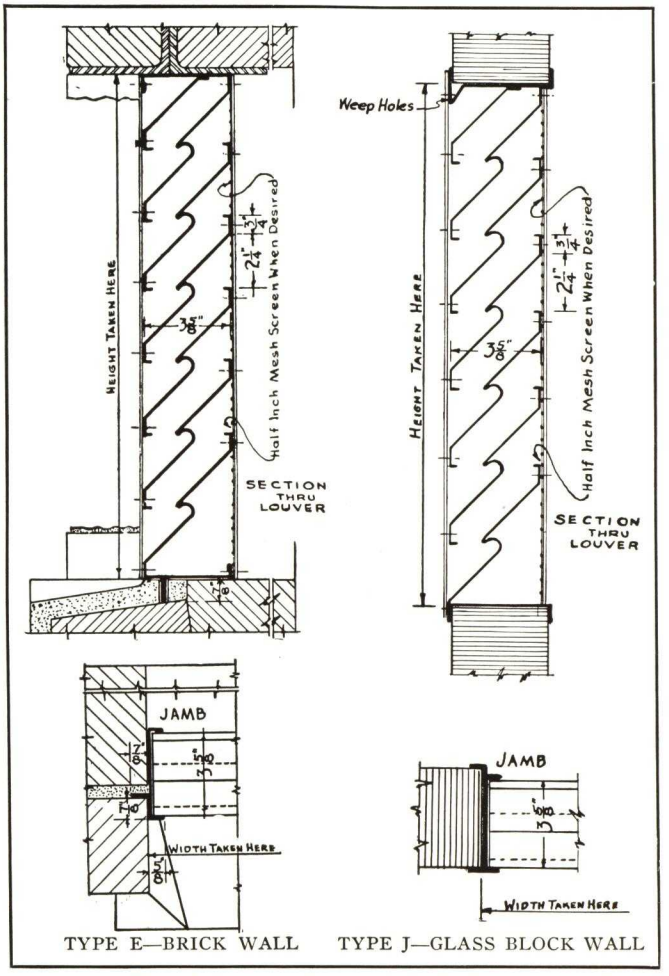
Shipments made promptly.

Specification (Insert in Masonry or Carpentry Contract)

Furnish and install, where shown on plans, Hoal's Louvers of size and design as indicated, manufactured by the AMERICAN SHEET METAL WORKS, New Orleans, La., and New York, N. Y. These louvers shall be made of (state kind of material). The louver frames shall be constructed in such a manner so as to insure a watertight connection between the frame and the wall.



Diagrams of Various Architectural Designs for Louvers



Sections Through Louvers—Suggested Jamb Constructions for Architects' Convenience

H. H. W. BERGMANN & CO.

ESTABLISHED 1908

Beco Adjustable Louvers–Hoal's Louvers–Ventilating Specialties

TELEPHONE
BEEKman 3-3448

126-132 Nassau Street, NEW YORK, N. Y.

BECO ADJUSTABLE STORMPROOF LOUVER FOR MASONRY AND GLASS BLOCK WALLS

For ventilation and controlling air supply in any type of gravity or air conditioning system with absolute protection under *all* weather conditions, the Beco Adjustable Stormproof Louver is adaptable to any type of building and wall structure. Power houses, transmitting stations, industrial buildings of all types, schools, churches and public buildings, *where the stormproof feature is essential,* and adequate provision must be made for controlled ventilation with weather protection, the Beco Adjustable Stormproof Louver should be used.

Beco Adjustable Stormproof Louver
Illustrating two louvers with a vertical mullion made for large size wall openings

(8) Fire retarding automatic closing device furnished when specified. Blades close by gravity.

(9) Louvers made of galvanized steel, cold rolled copper, aluminum, monel, stainless steel and acid-resisting alloy steel.

(10) Beco Adjustable Stormproof Louvers are made in single units and for large size wall openings, a series of mullioned units are made to fit any size opening.

(11) Wire mesh screens can be furnished on exterior of louver when required.

(12) Gear operators to regulate louvers in series for remote control are furnished on special order.

Features of Design and Construction

(1) Hollow metal frame of 18-gauge galvanized steel, with jambs for any type wall opening. Blades of 16-gauge galvanized steel. Also copper frames of 32-oz. and blades of 48-oz. cold rolled copper.

(2) Heavier gauge furnished when required up to No. 10.

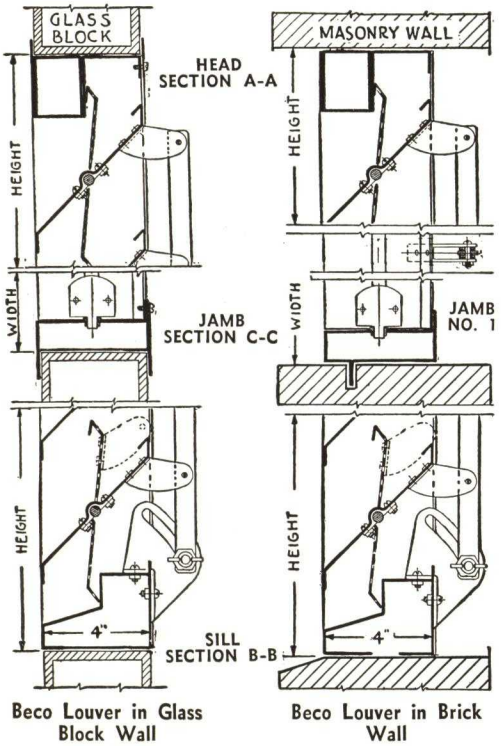
(3) Blades pressed into shape for rigidity, will not sag or buckle.

(4) Blades mounted and accurately balanced on brass bearings with bronze pivots.

(5) Ball bearing blades optional, furnished on special order.

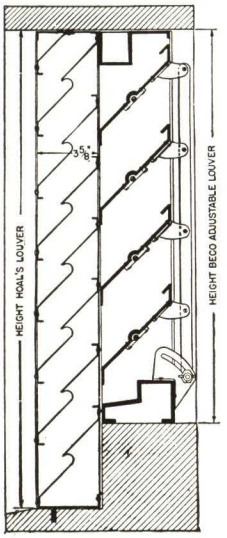
(6) All blades operate in unison and do not protrude when in open position. Blades can be removed in case of emergency without removing frame from wall.

(7) Blades are easily operated and open to 45° with adjustable locking device.



Beco Louver in Glass Block Wall | **Beco Louver in Brick Wall**

Leakproof—Other jambs can be furnished to install louver in any type wall structure and opening



"Hoal-Beco" Louver Combination

Recommended where a "Hoal's" Stationary Blade Louver on the exterior side of a building is desired

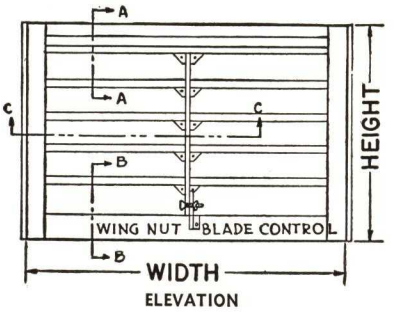
Engineering Service

Our Engineering Department is at your service in offering suggestions and in solving your problems of adapting louvers to any type of construction desired.

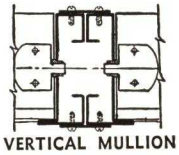
Shipments made promptly.

Specification (Insert in Masonry Contract)

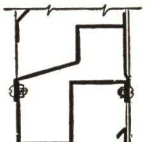
Furnish and install where shown on plans Beco Adjustable Stormproof Wall Louvers of size and type as indicated, manufactured by H. H. W. BERGMANN & Co., 132 Nassau Street, New York, N. Y. These louvers shall be made of (state kind of material) of the manufacturer's standard gauge or weight. The louver frames shall be constructed in such a manner so as to assure a watertight connection between the frame and the wall.



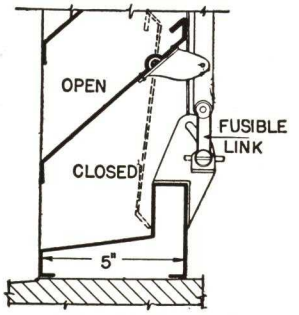
ELEVATION



VERTICAL MULLION



HORIZONTAL MULLION



Beco Automatic Fire Louver

A PARTIAL LIST OF STANDARD SIZES

Width, in.	12	18	24	30	36	42	48	54
Height of louver (inches)	12	12	12	12	12	18	24	24
	18	18	18	18	18	24	30	30
	24	24	24	24	24	30	36	36
	36	30	30	30	30	36	42	42
	48	36	36	36	36	42	48	48
	....	48	42	42	42	48	60	60
	....	....	48	48	48	60	72	72
	....	....	60	60	60	72	84	84
	....	....	72	72	72	84	....	....
	....	....	....	....	84	....	....	....

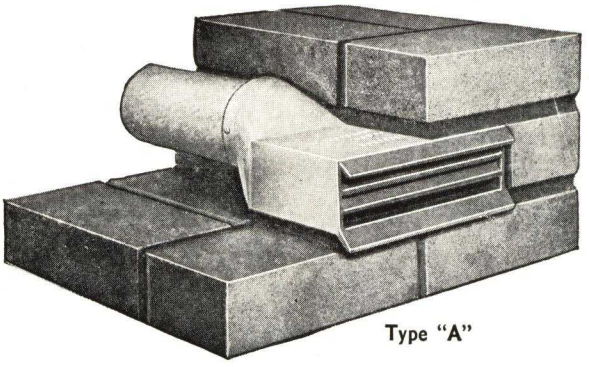
Beco Louvers can be furnished in any size.

BENJAMIN RIESNER

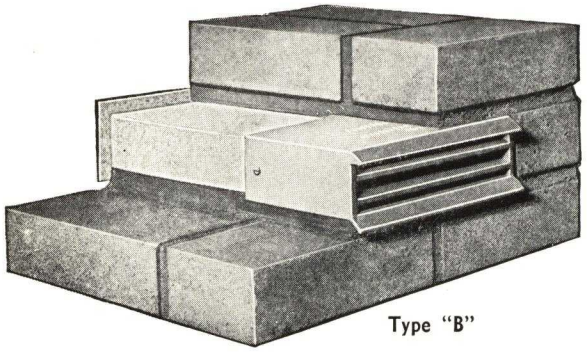
Manufacturer of the Riesner Ventilating Brick
353 East 78th Street, NEW YORK, N. Y.
TELEPHONE
BUtterfield 8-8580
ARCHITECTURAL EXHIBITS IN PRINCIPAL CITIES

See File Index for Riesner Ventilating Brick for Venting Oil Tanks

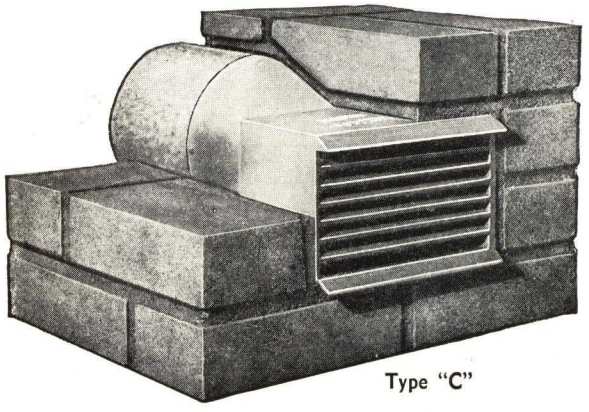
RIESNER VENTILATING BRICK—A LOUVERED WALL VENTILATOR



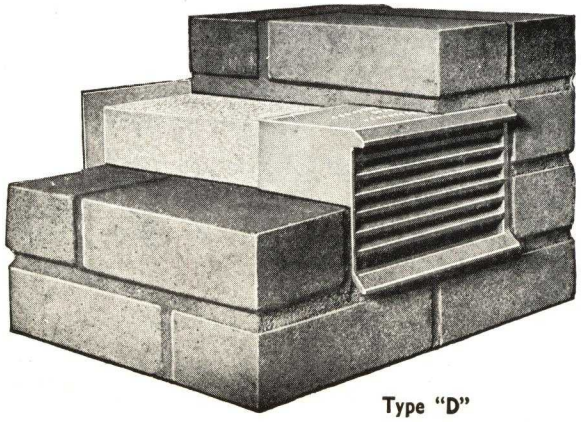
Type "A"



Type "B"



Type "C"



Type "D"

The Riesner Ventilating Brick is a hollow metal ventilating device which extends *through* the wall. It is the shape and size of one or two standard bricks and is constructed with a louvered face with waterdrip at top and bottom and an integral water stop in the casting.

Where Used

Riesner Ventilating Bricks are suitable for ventilating:

Air Spaces	Hung Ceilings	Attics
Kitchens	Transformer Rooms	Tunnels
Closets	Cellars	Mausoleums
Garbage Receivers	Cellar Rooms	Utility Rooms
Boiler Rooms	Cold Rooms	Gas Range Hoods

How Installed

The Riesner Ventilating Bricks are "bricked in" by the mason when building up the wall, at a point 6 in. below the ceiling, with the louvered face to the outer air and duct or flue in the room.

Construction, Types and Sizes

Riesner Ventilating Bricks are made of cast iron, or cast bronze, with galvanized iron or copper pipe or duct. They extend clear through the wall from the louvered face at the outside, to the brass flange or register face at the inside of the wall.

Made in four types as follows:

Type "A"—This type is the width and height of *one* standard brick (2¼x8 ins.) and transforms into a 3-in. diameter pipe which finishes with a brass flange at the inside of the wall.

Type "B"—Also the width and height of one standard brick (2¼x8 ins.) extends through the wall with a 2x8-in. duct and finishes with a 3x8¼ in. register face at the inside of the wall.

Type "C"—The width of *one* brick and the height of *two* bricks (4¾x8 ins.) and transforms into a 6-in. diameter pipe which finishes with a brass flange at inside of the wall.

Type "D"—The width of *one* brick and the height of *two* bricks (4¾x8 ins.). Type "D" extends through the wall with a 4½x8-in. duct and finishes with a 5⅞x9¼-in. register face at the inside of the wall.

Further Details—Types "B," "C" and "D" are furnished with bronze insect screen to prevent flies and insects from entering the ventilated areas.

Ventilating bricks are carried in stock for 12-in. walls and measure 13 ins. from exterior louvered face to pipe flange or register face at inside of wall. They can, however, be made up for 8-in. walls or any other wall thickness required.

Ventilating bricks can also be made up with elbows for ducts to meet special conditions.

Color

Cast iron ventilating bricks are painted a buff color.

Advantages

Riesner Ventilating Bricks do not take up any extra space. *They are bricked into and become a part of the wall.*

Ventilating bricks can be built into frame construction, brick walls and concrete forms.

They are used to ventilate air spaces under buildings and special rooms in cellars and attics and can be furnished with elbows and offsets where the area to be ventilated is below grade.

Types "A" and "C" can readily be connected to gas range hoods. Ventilating bricks are particularly useful in kitchens where there is no room for vertical vent shafts. *They constantly ventilate and remove gas fumes, steam and cooking odors from the room.*

Types "B" and "D" are designed to meet general ventilating requirements for cellars, air spaces and attics, etc., to allow a circulation of air and prevent dry rot.

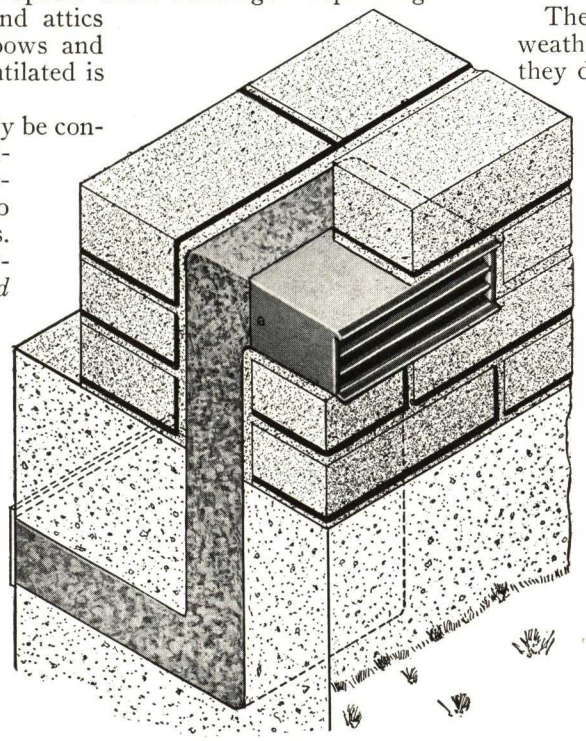
Ventilating bricks used in kitchens prevent discoloration of the walls and obviate the necessity of frequent repainting.

They are designed to be absolutely weatherproof, and economical because they do not deteriorate—the first cost is the only cost.

Specifications

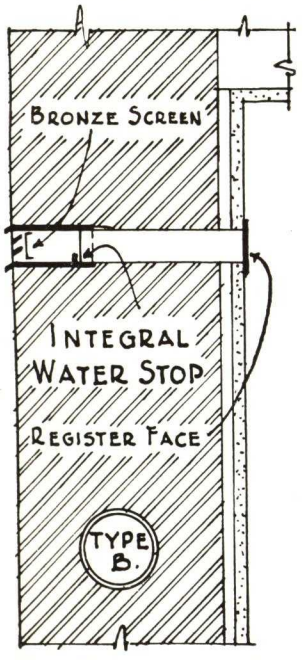
Specify under masonry heading:

Install Ventilating Bricks as manufactured by BENJAMIN RIESNER, 353 East 78th Street, New York, N. Y., in the walls 6 ins. below finished ceiling. (Specify type, location, wall thickness and whether cast iron or bronze.)



Type "B" with Duct to Ventilate Under Buildings and Special Rooms in Cellars

Type "D" can also be used where more ventilation is required



Type "B" Showing Integral Water Stop

Also bronze screen and register face in place

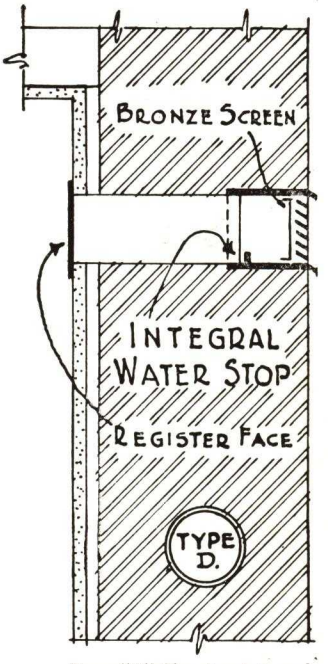
Prices, Cast Iron, for 12-in. Walls, F.O.B. New York, N. Y.

Type "A" with a brass wall flange	$ 5.50 each
Type "B" with 3x8¼-in. register face	6.50 each
Type "C" with a brass wall flange	11.50 each
Type "D" with 5⅞x9¼-in. register face	12.50 each

Type D can also be furnished with a positive damper which is operated and regulated to open and close from the inside.

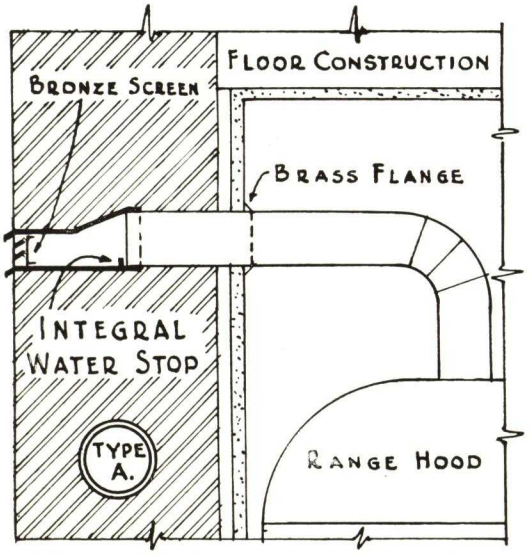
Cast bronze prices on application.

Estimates furnished for special duct and elbow work.

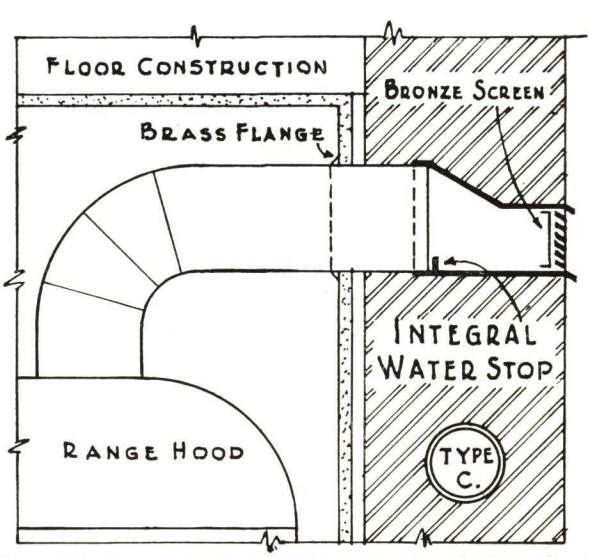


Type "D" Showing Integral Water Stop

Also bronze screen and register face in place



Type "A" Riesner Ventilating Brick with Integral Water Stop Attached to Gas Range Hood by Means of a Flue Pipe



Type "C" Riesner Ventilating Brick with Integral Water Stop Attached to a Gas Range Hood by Means of a Flue Pipe

MEMORANDA

MEMORANDA